Ms 5102/10-11. Eötvös Loránd jegyzeki: Földmágnesség

Nr 5102/10

$a \frac{\partial^{n-1} v}{\partial x^{n-1}}$ lábainkban vala.

Ms 5102/10

$$Z = -2a\sin\varphi - 2b\cos\varphi\sin\lambda + 2c\cos\varphi\cos\lambda$$
$$-\tfrac{3}{2}e\sin 2\varphi\sin\lambda + \tfrac{3}{2}f\cos^2\varphi\sin 2\lambda + \tfrac{3}{2}g\sin 2\varphi\cos\lambda + \tfrac{3}{2}i\cos^2\varphi\cos 2\lambda$$
$$-2k\left(1-\tfrac{3}{2}\cos^2\varphi\right)$$

$$X = -a\cos\varphi + b\sin\varphi\sin\lambda - c\sin\varphi\cos\lambda$$
$$-e\cos 2\varphi\sin\lambda - \tfrac{1}{2}f\sin 2\varphi\sin 2\lambda + g\cos 2\varphi\cos\lambda - \tfrac{1}{2}i\sin 2\varphi\cos 2\lambda$$
$$-k\sin 2\varphi$$

$$Y = -b\cos\lambda - c\sin\lambda$$
$$-e\sin\varphi\cos\lambda + f\cos\varphi\cos 2\lambda - g\sin\varphi\sin\lambda - i\cos\varphi\sin 2\lambda$$

$$Z = -\tfrac{1}{2}k - 2a\sin\varphi + \tfrac{3}{2}k\cos 2\varphi - 2b\cos\varphi\sin\lambda + 2c\cos\varphi\cos\lambda$$ 1912 Januar 30
$$-\tfrac{3}{2}e\sin 2\varphi\sin\lambda + \tfrac{3}{2}g\sin 2\varphi\cos\lambda + \tfrac{3}{4}f\sin 2\lambda + \tfrac{3}{4}i\cos 2\lambda$$
$$+\tfrac{3}{4}f\cos 2\varphi\sin 2\lambda + \tfrac{3}{4}i\cos 2\varphi\cos 2\lambda.$$

φ, λ pontban felvett kör tengelyrendszere: r = sugár

$$r\frac{\partial x}{\partial x} = \frac{\partial x'}{\partial\varphi} - Z, \quad r\frac{\partial y}{\partial y} = -X\operatorname{tg}\varphi - Z + \frac{\partial y'}{\partial\lambda}\frac{1}{\cos\varphi}$$
$$r\frac{\partial x}{\partial y} = \frac{1}{\cos\varphi}\frac{\partial x'}{\partial\lambda} + \operatorname{tg}\varphi\, y \qquad r\frac{\partial y}{\partial x} = +\frac{\partial y'}{\partial\varphi}$$

$$r\frac{\partial x}{\partial x} = +3a\sin\varphi + 3b\cos\varphi\sin\lambda - 3c\cos\varphi\cos\lambda + \tfrac{7}{2}e\sin 2\varphi\sin\lambda$$
$$-f\sin 2\lambda\left(\tfrac{7}{2}\cos^2\varphi - 1\right) - \tfrac{7}{2}g\sin 2\varphi\cos\lambda - i\cos 2\lambda\left(\tfrac{7}{2}\cos^2\varphi - 1\right) + k\left(4 - 7\cos^2\varphi\right)$$

$$r\frac{\partial y}{\partial y} = +3a\sin\varphi + 3b\cos\varphi\sin\lambda - 3c\cos\varphi\cos\lambda + \tfrac{5}{2}e\sin 2\varphi\sin\lambda$$
$$-f\sin 2\lambda\left(\tfrac{5}{2}\cos^2\varphi + 1\right) - \tfrac{5}{2}g\sin 2\varphi\cos\lambda - i\cos 2\lambda\left(\tfrac{5}{2}\cos^2\varphi + 1\right) + k\left(4 - 5\cos^2\varphi\right)$$

$$r\frac{\partial x}{\partial y} = r\frac{\partial y}{\partial x} = -e\cos\varphi\cos\lambda - f\sin\varphi\cos 2\lambda - g\cos\varphi\sin\lambda + i\sin\varphi\sin 2\lambda$$

$$r\left(\frac{\partial y}{\partial y} - \frac{\partial x}{\partial x}\right) = -e\sin 2\varphi\sin\lambda - f\sin 2\lambda\left(2 - \cos^2\varphi\right) + g\sin 2\varphi\cos\lambda - i\cos 2\lambda\left(2 - \cos^2\varphi\right)$$
$$+2k\cos^2\varphi$$

+371
×933
562

+794
−296
298

−3162

+594
695
1001

472
634
162

−847
+671
−171

−317
191
126

555
554

+283
129
154

+217
244
24

−9519

5067
138
4929

7845

+3879

7124
3879
3245

6614
357
6257
6625

766
398
368

164
105
9814

+1372
−1665
293

+1508
−1524
−116

+1773
−1308
465

+1546
−1530
16

156
147
56
722

+915
−1378
463

+1369
922
447

1109
1165
−56

+1177
1136

+

159
182
21
4079

ha $b=0$

$$\frac{\partial^2 V}{\partial x \partial z} = \left(-3\frac{z}{r^5}+15\frac{x^2 z}{r^7}\right)\int \alpha\, d\tau + \left(-3\frac{x}{r^5}+15\frac{xz^2}{r^7}\right)\int \gamma_0\, d\tau$$

$$+\left(45\frac{xz}{r^7}-105\frac{x^3 z}{r^9}\right)\left[\cos^2\lambda\, a_1\int \xi_0^2 d\tau + \sin^2\lambda\, b_2\int \eta_0^2 d\tau - \frac{\sin 2\lambda}{2}\left(a_2\int \eta_0^2 d\tau + b_1\int \xi_0^2 d\tau\right)\right]$$

$$+\left(\frac{12}{r^5}-105\frac{x^2 z^2}{r^9}\right)\left[\cos\lambda\, a_3\int \xi_0^2 d\tau - \sin\lambda\, b_3\int \xi_0^2 d\tau\right]$$

$$+\frac{15xz}{r^7}\left[\cos^2\lambda\, b_2\int \eta_0^2 d\tau + \sin^2\lambda\, a_1\int \xi_0^2 d\tau + \frac{\sin 2\lambda}{2}\left(a_2\int \eta_0^2 d\tau + b_1\int \xi_0^2 d\tau\right)\right]$$

$$+\left(\frac{12}{r^5}-105\frac{x^2 z^2}{r^9}\right)\left[\cos\lambda\, c_1\int \xi_0^2 d\tau - \sin\lambda\, c_2\int \eta_0^2 d\tau\right] +$$

$$+\left(45\frac{xz}{r^7}-105\frac{xz^3}{r^9}\right) c_3\int \xi_0^2 d\tau$$

$$+\frac{1}{2}\left(\frac{45z}{r^7}-\frac{630x^2 z}{r^9}+\frac{945x^4 z}{r^{11}}\right)\left[\left(a_0\cos\lambda - b_0\sin\lambda\right)\left(\cos^2\lambda\int \xi_0^2 d\tau + \sin^2\lambda\int \eta_0^2 d\tau\right)\right]$$

$$+\frac{1}{2}\left(-\frac{90z}{r^7}+\frac{105z^3}{r^9}\right)\left[\left(a_0\cos\lambda - b_0\sin\lambda\right)\left(\sin^2\lambda\int \xi_0^2 d\tau + \cos^2\lambda\int \eta_0^2 d\tau\right)\right]$$

$$+\frac{1}{2}\left(-\frac{60z}{r^7}-\frac{210x^2 z}{r^9}+\frac{945x^2 z^3}{r^{11}}\right)\left(a_0\cos\lambda - b_0\sin\lambda\right)\int \xi_0^2 d\tau$$

$$+\left(-\frac{90z}{r^7}+\frac{105z^3}{r^9}\right)\left(a_0\sin\lambda + b_0\cos\lambda\right)\frac{\sin 2\lambda}{2}\left[\int \xi_0^2 d\tau - \int \eta_0^2 d\tau\right]$$

$$+\frac{1}{2}\left(-\frac{60x}{r^7}-\frac{210xz^2}{r^9}+\frac{945x^3 z^2}{r^{11}}\right) c_0\left(\cos^2\lambda\int \xi_0^2 d\tau + \sin^2\lambda\int \eta_0^2 d\tau\right)$$

$$+\frac{1}{2}\left(-\frac{90x}{r^7}+\frac{105x^3}{r^9}\right) c_0\left[\sin^2\lambda\int \xi_0^2 d\tau + \cos^2\lambda\int \eta_0^2 d\tau\right]$$

$$+\frac{1}{2}\left(+\frac{45x}{r^7}-\frac{630xz^2}{r^9}+\frac{945xz^4}{r^{11}}\right) c_0\int \xi_0^2 d\tau$$

$$\alpha = \alpha_0 + \alpha_1\xi + \alpha_2\xi^2 + \beta_1\eta + \beta_2\eta^2 + \gamma_1\xi + \gamma_2\xi^2$$

$$V = \frac{\partial\left(\frac{1}{r}\right)}{\partial x}\left\{\alpha_0\int d\tau + \alpha_2\int\xi^2 d\tau + \alpha_2'\int\eta^2 d\tau + \alpha_2''\int\xi^2 d\tau\right\}$$

$$V = \frac{\partial\left(\frac{1}{r}\right)}{\partial x}\int\alpha\, d\tau - \frac{\partial^2\left(\frac{1}{r}\right)}{\partial x^2}\int\alpha_1\xi^2 d\tau + \frac{1}{2}\alpha_0\left[\frac{\partial^2\left(\frac{1}{r}\right)}{\partial x^2}\int\xi^2 d\tau + \frac{\partial^2\frac{1}{r}}{\partial y^2}\int\eta^2 d\tau + \frac{\partial^2\left(\frac{1}{r}\right)}{\partial z^2}\int\xi^2 d\tau\right]$$

$$+ \frac{\partial\left(\frac{1}{r}\right)}{\partial y}\int\beta\, d\tau - \frac{\partial^2\left(\frac{1}{r}\right)}{\partial y^2}\int\beta_1\eta^2 d\tau + \frac{1}{2}\beta_0\left[\frac{\partial^2\frac{1}{r}}{\partial x^2\partial y}\int\xi^2 d\tau + \frac{\partial^2\frac{1}{r}}{\partial y^3}\int\eta^2 d\tau + \frac{\partial^2\frac{1}{r}}{\partial z^2\partial y}\int\xi^2 d\tau\right]$$

$$+ \frac{\partial\frac{1}{r}}{\partial z}\int\gamma\, d\tau - \frac{\partial^2\frac{1}{r}}{\partial z^2}\int\beta_1\xi^2 d\tau + \frac{1}{2}\gamma_0\left[\frac{\partial^2\frac{1}{r}}{\partial x^2\partial z}\int\xi^2 d\tau + \frac{\partial^2\frac{1}{r}}{\partial y^2\partial z}\int\eta^2 d\tau + \frac{\partial^2\frac{1}{r}}{\partial z^3}\int\xi^2 d\tau\right]$$

$$\alpha' = \alpha_0' + \alpha_1'\xi' + \alpha_2'\xi_1^2$$

$$\alpha_0' = \alpha_0\cos\lambda - \beta_0\sin\lambda \qquad \xi' = \xi\cos\lambda - \eta\sin\lambda$$

$$\alpha' = \alpha_0\cos\lambda - \beta_0\sin\lambda$$

$$\alpha' = \left(\alpha_0 + \alpha_1\xi + \alpha_2\xi^2\right)\cos\lambda - \left(\beta_0 + \beta_1\eta + \beta_2\eta^2\right)\sin\lambda$$

$$\alpha' = \alpha_0' + \alpha_1'\xi' + \alpha_2'\xi'^2$$

$$\alpha = \alpha_0 + \alpha_1\xi + \alpha_2\xi^2$$

$$\alpha_0 = a_0 + a_1\xi_0 + a_{11}\xi_0^2 + a_2\eta_0 + a_{22}\eta_0^2 + a_{12}\xi_0\eta_0 + a_3\zeta_0 + a_{33}\zeta_0^2 + a_{13}\xi_0\zeta_0 + a_{23}\eta_0\zeta_0$$

$$\beta_0 = b_0 + b_1\xi_0 + b_{11}\xi_0^2 + b_2\eta_0 + b_{22}\eta_0^2 + b_{12}\xi_0\eta_0 + b_3\zeta_0 + b_{33}\zeta_0^2 + b_{13}\xi_0\zeta_0 + b_{23}\eta_0\zeta_0$$

$$\int \alpha\xi\, d\tau = \cos^2\lambda \int a_1\xi_0^2\, d\tau + \sin^2\lambda\, b_2 \int \eta_0^2\, d\tau - \sin\lambda\cos\lambda\left(a_2\int \eta_0^2\, d\tau + b_1\int \xi_0^2\, d\tau\right)$$

$$\int \alpha\eta\, d\tau = \cos^2\lambda\, a_2\int \eta_0^2\, d\tau - \sin^2\lambda\, b_1\int \xi_0^2\, d\tau + \sin\lambda\cos\lambda\left(a_1\int \xi_0^2\, d\tau - b_2\int \eta_0^2\, d\tau\right)$$

$$\int \alpha\zeta\, d\tau = \cos\lambda\, a_3\int \zeta_0^2\, d\tau - \sin\lambda\, b_3\int \zeta_0^2\, d\tau$$

$$\int \beta\xi\, d\tau = \cos^2\lambda\, b_1\int \xi_0^2\, d\tau - \sin^2\lambda\, a_2\int \eta_0^2\, d\tau + \sin\lambda\cos\lambda\left(a_1\int \xi_0^2\, d\tau - b_2\int \eta_0^2\, d\tau\right)$$

$$\int \beta\eta\, d\tau = \cos^2\lambda\, b_2\int \eta_0^2\, d\tau + \sin^2\lambda\, a_1\int \xi_0^2\, d\tau + \sin\lambda\cos\lambda\left(a_2\int \eta_0^2\, d\tau + b_1\int \xi_0^2\, d\tau\right)$$

$$\int \beta\zeta\, d\tau = \cos\lambda\, b_3\int \zeta_0^2\, d\tau + \sin\lambda\, a_3\int \zeta_0^2\, d\tau$$

$$\int \gamma\xi\, d\tau = \cos\lambda\, c_1\int \xi_0^2\, d\tau - \sin\lambda\, c_2\int \eta_0^2\, d\tau$$

$$\int \gamma\eta\, d\tau = \cos\lambda\, c_2\int \eta_0^2\, d\tau + \sin\lambda\, c_1\int \xi_0^2\, d\tau$$

$$\int \gamma\zeta\, d\tau = c_3\int \zeta_0^2\, d\tau$$

$$\int \alpha\xi^2\, d\tau = \int (a_0\cos\lambda - b_0\sin\lambda)(\xi_0^2\cos^2\lambda + \eta_0^2\sin^2\lambda)$$

$$\int \alpha\eta^2\, d\tau = \int (a_0\cos\lambda - b_0\sin\lambda)(\xi_0^2\sin^2\lambda + \eta_0^2\cos^2\lambda)$$

$$\int \alpha\zeta^2\, d\tau = \int (a_0\cos\lambda - b_0\sin\lambda)\zeta_0^2\, d\tau$$

$$\int \alpha\xi\eta\, d\tau = \int (\qquad\qquad)(\xi_0^2\sin\lambda\cos\lambda - \eta_0^2\sin\lambda\cos\lambda)$$

~~$\int \alpha\eta\zeta\, d\tau = \int (\qquad\qquad)$~~

$$\int \alpha\xi\zeta\, d\tau = \rho\int \alpha\eta\zeta\, d\tau = 0$$

$$\alpha_0 = \alpha_{00} + \alpha_{01}\xi_0 + \alpha_{02}\xi_0^2 + \dots \qquad \}$$

$\int dt$

$$\int x\,d\tau = \cos\lambda \int \alpha_0\,d\tau - \sin\lambda \int \beta_0\,d\tau$$

$$\int \beta\,d\tau = \sin\lambda \int \alpha_0\,d\tau + \cos\lambda \int \beta_0\,d\tau$$

$$\int \gamma\,d\tau = \int \gamma_1\,d\tau$$

$$\int \alpha\xi\,d\tau = \cos^2\lambda\ \alpha_{01}\int \xi_0^2\,d\tau + \sin^2\lambda\,\beta_{01}\int \zeta_0^2\,d\tau - \sin\lambda\cos\lambda$$

α_0' α_1'

$$T = \alpha_0 + \alpha_{01}\xi + \alpha_{02}\zeta + \dots$$

$$T = \alpha_0' + \alpha_{01}'\xi + \dots$$

$$\alpha = \alpha_0 + \alpha_1 r\cos\varphi + \alpha_2 r\sin\varphi + \alpha_3 r^2\cos^2\varphi + \alpha_4 r^2\sin^2\varphi + \alpha_5 r^2\sin 2\varphi.$$

$$\alpha = \alpha_0 + \alpha_1 r\cos\varphi + \alpha_2 r\sin\varphi + \alpha_3 r^2\cos 2\varphi + \alpha_4 r^2\sin 2\varphi.$$

$$+\alpha_5 z + \alpha_6 z^2 + \alpha_7 rz\cos\varphi.$$

$$\int \beta \xi^2 d\tau = \int (a_0 \sin\lambda + b_0 \cos\lambda)(\xi_0^2 \cos^2\lambda + \eta_0^2 \sin^2\lambda)\, d\tau$$

$$\int \beta \eta^2 d\tau = \int (\quad)\xi_0^2 \sin^2\lambda + \eta_0^2 \cos^2\lambda)\, d\tau$$

$$\int \beta \xi^2 d\tau = \int (\quad)\xi_0^2 d\tau$$

$$\int \beta \xi\eta\, d\tau = \int (\quad)(\xi_0^2 \cos\lambda \sin\lambda - \eta_0^2 \sin\lambda \cos\lambda)\, d\tau$$

$$\int \beta \xi\zeta\, d\tau = 0 \qquad \int \beta \eta\zeta\, d\tau = 0$$

$$\int \gamma \xi^2 d\tau = c_0 \int (\xi_0^2 \cos^2\lambda + \eta_0^2 \sin^2\lambda)\, d\tau$$

$$\int \gamma \eta^2 d\tau = c_0 \int (\xi_0^2 \sin^2\lambda + \eta_0^2 \cos^2\lambda)\, d\tau$$

$$\int \gamma \zeta^2 d\tau = c_0 \int \zeta_0^2 d\tau$$

$$\int \gamma \xi\eta\, d\tau = c_0 \int (\xi_0^2 \sin\lambda\cos\lambda - \eta_0^2 \sin\lambda\cos\lambda)\, d\tau$$

$$\int \gamma \xi\zeta\, d\tau = 0 \qquad \int \gamma \eta\zeta\, d\tau = 0$$

$$\frac{a_0 \varrho}{\varrho^2 + a_0^2} = \varkappa .$$

$$\frac{\partial^2 V}{\partial x \partial z} = -3 \frac{A}{\sqrt{\varrho^2 + a_0^2}}$$

$$\frac{\partial^2 V}{\partial z^2} = -3 \frac{C}{\sqrt{\varrho^2 + a_0^2}} \left\{ \left[1 - \left(5C - \frac{\varrho}{a_0} \right) \cos\alpha + \left(\frac{35}{2} C^2 - 5 \frac{\varrho}{a_0} C \right) \cos^2\alpha - \left(\frac{315}{6} C^3 - \frac{35}{2} \frac{\varrho}{a_0} C^2 \right) \cos^3\alpha \right.\right.$$

$$\left.\left. + \left(\frac{3465}{24} C^4 - \frac{315}{6} \frac{\varrho}{a_0} C^3 \right) \cos^4\alpha + \frac{3465}{24} \frac{\varrho}{a_0} C^4 \cos^5\alpha \right] \right.$$

$$g + a \sin\alpha \cos\delta + a \cos\alpha \sin\delta + b \cos\alpha \cos\delta + b \sin\alpha \sin\delta$$

$$g + (a\cos\delta + b\sin\delta)\sin\alpha + (b\cos\delta - a\sin\delta)\cos\alpha + (A\cos 2\delta + B\sin 2\delta)\sin 2\alpha$$

$$+ (B\cos 2\delta - A\sin 2\delta)\cos 2\alpha .$$

$$\frac{\partial^2 V}{\partial \varkappa \partial z} = -3 \frac{C}{\sqrt{\varrho^2 + a_0^2}} \left\{ 2g\pi \right.$$

$$- \left(5C - \frac{\varrho}{a_0} \right) \left[(b\cos\delta - a\sin\delta)\pi \right]$$

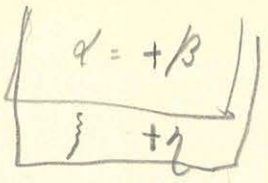
$$+ \left(\frac{35}{2} C^2 - 5 \frac{\varrho}{a_0} C \right) \left\{ g\pi + (B\cos 2\delta - A\sin 2\delta) \frac{\pi}{2} \right\}$$

$$- \left(\frac{315}{6} C^3 - \frac{35}{2} \frac{\varrho}{a_0} C^2 \right) \left\{ (b\cos\delta - a\sin\delta) \frac{3}{4}\pi \right\}$$

$$+ \left(\frac{3465}{24} C^4 - \frac{315}{6} \frac{\varrho}{a_0} C^3 \right) \left\{ \frac{3}{4} \pi g + (B\cos 2\delta - A\sin 2\delta) \frac{\pi}{2} \right\}$$

$$\left. + \frac{3465}{24} \frac{\varrho}{a_0} C^4 \left\{ (b\cos\delta - a\sin\delta) \frac{5}{8}\pi \right. \right.$$

Am with $\frac{\partial X}{\partial \zeta}$ ha $a=0$ $b=0$



β helyett $+\alpha$

η helyett $+\xi$

1) $\frac{\partial X}{\partial \zeta} = -\frac{3}{c^4}\int \alpha\, d\tau + \frac{12}{c^5}\int \alpha\xi\, d\tau + \frac{45}{2}\frac{1}{c^6}\int \alpha\xi^2 d\tau + \frac{15}{2}\frac{1}{c^6}\int \alpha\eta^2 d\tau - \frac{30}{c^6}\int \alpha\xi^2 d\tau$

$+\frac{15}{c^6}\int \beta\xi\eta\, d\tau + \frac{12}{c^5}\int \gamma\xi\, d\tau - \frac{60}{c^6}\int \gamma\xi\xi\, d\tau$

2) $+\frac{3}{c^4}\int \beta\, d\tau - \frac{12}{c^5}\int \beta\xi\, d\tau - \frac{45}{2}\frac{1}{c^6}\int \beta\eta^2 d\tau - \frac{15}{2}\frac{1}{c^6}\int \beta\xi^2 d\tau + \frac{30}{c^6}\int \beta\xi^2 d\tau$

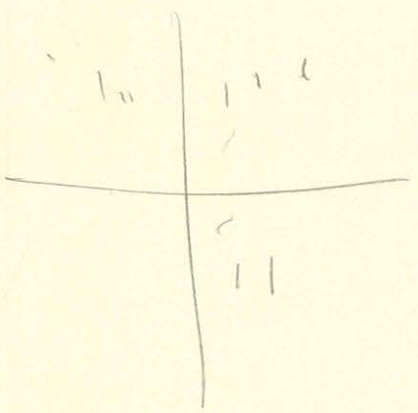
$-\frac{15}{c^6}\int \alpha\eta\xi\, d\tau - \frac{12}{c^5}\int \gamma\eta\, d\tau + \frac{60}{c^6}\int \gamma\eta\xi\, d\tau$

3 $+\frac{3}{c^4}\int \alpha\, d\tau - \frac{12}{c^5}\int \alpha\xi\, d\tau - \frac{45}{2}\frac{1}{c^6}\int \alpha\xi^2 d\tau - \frac{15}{2}\frac{1}{c^6}\int \alpha\eta^2 d\tau + \frac{30}{c^6}\int \alpha\xi^2 d\tau$

$-\frac{15}{c^6}\int \beta\xi\eta\, d\tau - \frac{12}{c^5}\int \gamma\xi\, d\tau + \frac{60}{c^6}\int \gamma\xi\xi\, d\tau$

4 $-\frac{3}{c^4}\int \beta\, d\tau + \frac{12}{c^5}\int \beta\xi\, d\tau + \frac{45}{2}\frac{1}{c^6}\int \beta\eta^2 d\tau + \frac{15}{2}\frac{1}{c^6}\int \beta\xi^2 d\tau - \frac{30}{c^6}\int \beta\xi^2 d\tau$

$+\frac{15}{c^6}\int \alpha\eta\xi\, d\tau + \frac{12}{c^5}\int \gamma\xi\, d\tau - \frac{60}{c^6}\int \gamma\eta\xi\, d\tau$



$$0 \quad a + 0 + c + e + 0 + 0$$

$$60 \quad a + \frac{\sqrt3}{2}b + \frac12 c + \frac14 e + \frac34 f + \frac{\sqrt3}{2} g$$

$$120 \quad a + \frac{\sqrt3}{2}b - \frac12 c + \frac14 e + \frac34 f - \frac{\sqrt3}{2} g$$

$$180 \quad a \quad 0 \quad -c + e + 0 \quad 0$$

$$240 \quad a - \frac{\sqrt3}{2}b - \frac12 c + \frac14 e + \frac34 f + \frac{\sqrt3}{2} g$$

$$300 \quad a - \frac{\sqrt3}{2}b + \frac12 c + \frac14 e + \frac34 f - \frac{\sqrt3}{2} g.$$

$$2a + 2e = h_0 + h_{180}$$

$$2a + \frac12 e + \frac32 f + \sqrt3 g = h_{60} + h_{240}$$

$$2a + \frac12 e + \frac32 f - \sqrt3 g = h_{120} + h_{300}$$

$$\begin{cases} 4a + e + 3f = h_{60} + h_{120} + h_{240} + h_{300} \\ 6a + 3e + 3f = \Sigma \end{cases}$$

$$h_0 - h_{180} = +2c$$

$$h_0 + h_{180} = +2a + 2e$$

$$\Sigma = 6a + 3e + 3f.$$

$$h_{120} - h_{300} = \sqrt3 b - c$$

$$h_{60} - h_{240} = \sqrt3 b + c$$

~~$a + c + e$~~

$$h_0 = a + c + e$$

$$h_{120} + h_{60} = 2a + \sqrt3 b + \frac12 e + \frac32 f$$

$$h_{180} = a - c + e$$

$$h_{240} - h_{60} = -\sqrt3 b - c$$

$$h_{300} + h_{60} = 2a + c + \frac12 e + \frac32 f$$

$$\cos 2\lambda \left[\int\int \alpha_0 \eta_0 d\tau + \int \beta_0 \xi_0 d\tau\right] + \sin 2\lambda \left[\int\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right]$$

$$\cos\lambda \left[\int\int \beta_0 \xi_0 d\tau + \int \gamma_0 \eta_0 d\tau\right] + \sin\lambda \left[\int\int \alpha_0 \xi_0 d\tau + \int \gamma_0 \xi_0 d\tau\right]$$

$$\cos\lambda \left[\int\int \alpha_0 \xi_0 d\tau + \int \gamma_0 \xi_0 d\tau\right] - \sin\lambda \left[\int\int \beta_0 \xi_0 d\tau + \int \gamma_0 \eta_0 d\tau\right]$$

$$+ \cos^2\lambda \left\{ -\frac{\partial^2 \frac{1}{r}}{\partial x^2} \right\} \left[\int\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right] + \frac{\partial^2 \frac{1}{r}}{\partial z^2} \int \beta_0 \eta_0 d\tau \Big\}$$

$$+ \sin^2\lambda \left\{ -\frac{\partial^2 \frac{1}{r}}{\partial y^2} \left[-\int \beta_0 \eta_0 d\tau + \int \alpha_0 \xi_0 d\tau \right] + \frac{\partial^2 \frac{1}{r}}{\partial z^2} \int \beta_0 \xi_0 d\tau \right]$$

$$-\sin 2\lambda \frac{\partial^2 \frac{1}{r}}{\partial x \partial y} \left\{ \int\int \alpha_0 \xi d\tau - \int \beta_0 \eta_0 d\tau \right\}$$

$2\cos^2\lambda - 1$

$2\cos^2\lambda - 1 = \cos 2\lambda$

$\cos 2\lambda = \cos^2\lambda - \sin^2\lambda = 1 - 2\sin^2\lambda$

$\cos 2\lambda = 1 - 2\sin^2\lambda$

$\sin^2\lambda = \frac{1 - \cos 2\lambda}{2}$

$\cos^2\lambda = \cos 2\lambda + \sin^2\lambda$

$\therefore \cos 2\lambda = 2\cos^2\lambda - 1$

$\cos^2\lambda = \frac{\cos 2\lambda + 1}{2}$

$\cos^2\lambda = \cos 2\lambda + \sin^2\lambda$

$\sin^2\lambda = \frac{1}{2} - \frac{\cos 2\lambda}{2}$

$\cos^2\lambda = \frac{1}{2} + \frac{\cos 2\lambda}{2}$

$$\left(-\frac{\partial^2 \frac{1}{r}}{\partial x^2} \cos^2\lambda + \frac{\partial^2 \frac{1}{r}}{\partial y^2} \sin^2\lambda \right) \left[\int\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right] + \frac{\partial^2 \frac{1}{r}}{\partial z^2} \int \beta_0 \eta d\tau$$

$$-\frac{1}{2}\frac{\partial^2 \frac{1}{r}}{\partial x^2} - \frac{1}{2}\frac{\partial^2 \frac{1}{r}}{\partial x^2} \cos 2\lambda + \frac{1}{2}\frac{\partial^2 \frac{1}{r}}{\partial y^2} + \frac{1}{2}\frac{\partial^2 \frac{1}{r}}{\partial y^2} \cos 2\lambda$$

$$\left(+\frac{1}{2}\frac{\partial^2 \frac{1}{r}}{\partial z^2} + \frac{1}{2}\cos 2\lambda \left(\frac{\partial^2 \frac{1}{r}}{\partial y^2} - \frac{\partial^2 \frac{1}{r}}{\partial x^2} \right) \right) \left[\int\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right] + \frac{\partial^2 \frac{1}{r}}{\partial z^2} \int \beta_0 \eta d\tau.$$

$+\frac{1}{L}\frac{\partial^2 \bar{z}}{\partial x^2}$

10. vonás bimotor hegy.

$\lambda = 0$	$+35,0$	$-62,5$	$-66,5$
90	$+18,2$	$-37,5$	$-43,8$
180	$-70,7$	$+105,6$	$+97,9$
270	$+13,1$	$-102,0$	$-99,9$

$$-3\frac{C}{a^4} + 12\frac{\xi}{a^5} = +35,0 \qquad +3\frac{C}{a^4} - 12\frac{\xi}{a^5} = -64,5$$

$$-3\frac{C}{a^4} + 12\frac{F}{a^5} = +18,2 \qquad +3\frac{C}{a^4} + 12\frac{F}{a^5} = -40,7$$

$$-3\frac{C}{a^4} - 12\frac{\xi}{a^5} = -70,7 \qquad +3\frac{C}{a^4} + 12\frac{\xi}{a^5} = +101,8$$

$$-3\frac{C}{a^4} + 12\frac{F}{a^5} = 13,1 \qquad +3\frac{C}{a^4} - 12\frac{F}{a^5} = -101,0$$

$\frac{1}{L}C_1$ bimotor hegy.

$\lambda = 0$	$+109$	$+104$
90	$+100$	$+110$
180	$+56$	$+41$
270	$+57$	-7

$\lambda = 0$	-77	$+88$
$\lambda = 90$	-56	$+66$
180	-82	$+90$
270	-98	$+82$

$-\frac{3}{a_4}\int \beta_0 dt + \frac{B}{a^5} + \frac{C}{a^6}$.

/58

20,8 { 300,8 +157,8 / 303,0 +162,9 } 159,9 (120) 160. 25 +60

18. +34

21,6 272 +131,0 / 269 +126,1 } 128,6 (70) -80 -30

25,0 199 +64,2 / 200 57,4 } 59,2 (30.1)

93,6 109

26,9 187. 42,7 | 42,7

$29929603 = -3X + 0{,}0480877Y + 0{,}0023111Z$

$2{,}801411$

$27993420 = -3X + 0{,}046296Y + 0{,}002143Z$

$2{,}620184$

$23164063 = -3X + 0{,}040000 + 0{,}001600Z.$

$2{,}168156$

$3{,}5350921$

$1936183 = 0{,}001781Y + 0{,}000168Z = 0{,}187227$

$4829357 = 0{,}006296Y + 0{,}000543Z = 0{,}452028$

$6296Y + 543Z = 452028$

$+ 593{,}8955Z = 64065{,}4$

$50{,}8955 = 18862{,}6$

$Z = +3706{,}14$

$Y = -247{,}84$

$X = -2{,}050642$

14 094183
11,474000
2,620183

11915404
2801411
14716815
8564890
6,151925
7,942258

2,012424
452028
1,560406

$$-30\int \alpha_0\xi_0\xi_0\,d\tau - 30\int \beta_0\eta_0\xi_0\,d\tau$$

$$-45\int \beta_0\eta_0\xi_0\,d\tau - 45\int \alpha_0\xi_0\xi_0\,d\tau$$

$$-15\int \xi_0^2\gamma_0\,d\tau - 15\int \eta_0^2\gamma_0\,d\tau$$

$$+\frac{15}{4}\int \eta_0^2\gamma_0\,d\tau + \frac{15}{4}\int \xi_0^2\gamma_0\,d\tau$$

$$+\frac{45}{2}\int \beta_0\xi_0^2\,d\tau$$

$$-75\int \alpha_0\xi_0\xi_0\,d\tau - 75\int \beta_0\eta_0\xi_0\,d\tau - \frac{45}{4}\int \xi_0^2\gamma_0\,d\tau - \frac{45}{4}\int \eta_0^2\gamma_0\,d\tau + \frac{45}{2}\int \xi_0^2\gamma_0\,d\tau$$

$$+\cos 2\lambda\left\{15\int \alpha_0\xi_0\xi_0\,d\tau - 15\int \beta_0\eta_0\xi_0\,d\tau - \frac{75}{4}\int \xi_0^2\gamma_0\,d\tau + \frac{75}{4}\int \eta_0^2\gamma_0\,d\tau\right\}$$

$$+\sin 2\lambda\left\{-15\left[\int \alpha_0\eta_0\xi_0\,d\tau + \int \beta_0\xi_0\xi_0\,d\tau\right] + \frac{75}{2}\int \xi_0\eta_0\gamma_0\,d\tau\right\}.$$

$$\frac{\partial^2 V}{\partial\nu\,\partial\lambda} = -\frac{2}{a^4}\int \gamma_0\,d\tau + \frac{1}{a^6}\sqrt{\quad}$$

$\left.\begin{matrix}\\ \\ \\ \end{matrix}\right\}$ α

$\left.\begin{matrix}\\ \\ \\ \end{matrix}\right\}$ $\log \beta$

$\left.\begin{matrix}\\ \\ \\ \end{matrix}\right\}$ $\log -\eta$

$$\frac{\partial V}{\partial\nu\,\partial\lambda} = a + b\sin\lambda + c\cos\lambda + e\cos 2\lambda + f\sin 2\lambda + g\sin 2\lambda.$$

$\lambda = 0$	$a + c + e$	$a + e$
45	$a + \frac{1}{\sqrt{2}}b + \frac{1}{\sqrt{2}}c + \frac{1}{2}e + \frac{1}{2}f + g$	c
90	$a + b + f$	$a + f$
135	$a + \frac{1}{\sqrt{2}}b - \frac{1}{\sqrt{2}}c + \frac{1}{2}e + \frac{1}{2}f - g$	
180	$a - c + e$	b
225		
270	$a - b + f$	
315		

$$4a + 2e + 2f.$$

$$+\frac{1}{2}e + \frac{1}{2}f,$$

$$2a + \sqrt{2}b + \frac{1}{2}e + \frac{1}{2}f$$

$$\frac{\partial \bar{U}}{\partial \Sigma x} = +\frac{12}{a^5}\int \alpha \xi\, d\tau - \frac{60}{a^6}\int \alpha \xi\xi\, d\tau + 15\frac{1}{a^6}\int \beta \eta \xi\, d\tau$$

$$-3\frac{1}{a^4}\int \gamma\, d\tau + \frac{12}{a^5}\int \gamma \xi\, d\tau - 30\frac{1}{a^6}\int \gamma \xi^2 d\tau + \frac{15}{2}\frac{1}{a^6}\int \gamma \eta^2 d\tau + \frac{45}{2}\frac{1}{a^6}\int \gamma \xi^2 d\tau$$

$\xi = \xi_0 \cos\lambda - \eta_0 \sin\lambda$ $\qquad \eta = \xi_0 \sin\lambda + \eta_0 \cos\lambda$.

$\xi_0^2 \cos^2\lambda + \eta_0^2 \sin^2\lambda - \xi_0\eta_0 \sin 2\lambda$ $\qquad \xi_0^2 \sin^2\lambda + \eta_0^2 \cos^2\lambda + \xi_0\eta_0 \sin 2\lambda$

$$\frac{\partial^2 \eta}{\partial \Sigma x^2} = -\frac{3}{a^4}\int \gamma_i d\tau + \frac{12}{a^5}\int \alpha_i \xi_0 d\tau + \frac{45}{2}\frac{1}{6}\int \gamma_i \xi_0^2 d\tau$$

$$+\sin\lambda\left\{\frac{60}{a^6}\int \alpha_i \eta_0 \xi_0 d\tau + \frac{15}{a^6}\int \beta_i \xi_0 \xi_0 d\tau - \frac{12}{a^5}\int \gamma_i \eta_0 d\tau\right\}$$

$$+\cos\lambda\left\{-\frac{60}{a^6}\int \alpha_i \xi_0 \xi_0 d\tau + \frac{15}{a^6}\int \beta_i \eta_0 \xi_0 d\tau + \frac{12}{a^5}\int \gamma_i \xi_0 d\tau\right\}$$

$$\cos^2\lambda\left\{-\frac{30}{a^6}\int \gamma_i \xi_0^2 d\tau + \frac{15}{2}\frac{1}{a^6}\int \gamma_i \eta_0^2 d\tau\right\}$$

$$\sin^2\lambda\left\{-\frac{30}{a^6}\int \gamma_i \eta_0^2 d\tau + \frac{15}{2}\frac{1}{a^6}\int \gamma_i \xi_0^2 d\tau\right\} + \frac{1}{a^6}\sin 2\lambda \frac{75}{2}\int \gamma_i \xi_0 \eta_0 d\tau$$

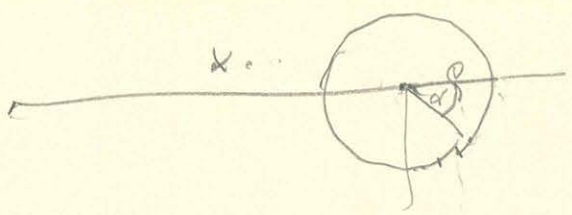
$$\frac{\partial^2 u}{\partial x \partial z} = -\frac{3}{a^4}\int \gamma_i d\tau + \frac{12}{a^5}\int \alpha_i \xi_0 d\tau - \frac{45}{4}\frac{1}{a^6}\int \gamma_i \xi_0^2 d\tau - \frac{45}{4}\frac{1}{a^6}\int \gamma_i \eta_0^2 d\tau + \frac{45}{2}\frac{1}{a^6}\int \gamma_i \xi_0^2 d\tau$$

$$+\sin\lambda\left\{-\frac{12}{a^5}\int \gamma_i \eta_0 d\tau + \frac{60}{a^6}\int \alpha_i \eta_0 \xi_0 d\tau + \frac{15}{a^6}\int \beta_i \xi_0 \xi_0 d\tau\right\}$$

$$+\cos\lambda\left\{+\frac{12}{a^5}\int \gamma_i \xi_0 d\tau - \frac{60}{a^6}\int \alpha_i \xi_0 \xi_0 d\tau + \frac{15}{a^6}\int \beta_i \eta_0 \xi_0 d\tau\right\}$$

$$+\sin 2\lambda \frac{75}{2}\frac{1}{a^6}\int \gamma_0 \xi_0 \eta_0 d\tau + \cos 2\lambda\left\{+\frac{75}{4}\frac{1}{a^6}\int \gamma_i \eta_0^2 d\tau - \frac{75}{4}\frac{1}{a^6}\int \gamma_i \xi_0^2 d\tau.\right\}$$

$$V = \int \gamma \frac{\partial \frac{1}{r}}{\partial z} d\tau$$



$\rho = \frac{2}{5} R$.

$$\frac{\partial^2 V}{\partial x \partial z} = \int \gamma \frac{\partial \frac{1}{r}}{\partial x \partial z^2} d\tau .$$

$$\frac{\partial \frac{1}{r}}{\partial x \partial z} = -3 \frac{a}{(a^2+b^2)^{\frac{5}{2}}}$$

$$\gamma d\tau = \rho \rho \, d\alpha \left(g + a \sin\alpha + b \cos\alpha + A \sin 2\alpha + B \cos 2\alpha\right).$$

$$a = a_0 + \rho \cos\alpha$$

$$b = \rho \sin\alpha .$$

$$\frac{\partial \frac{1}{r}}{\partial x \partial z} = -3 \frac{a_0 + \rho\cos\alpha}{\left(\rho^2 + a_0^2 + 2 a_0 \rho \cos\alpha\right)^{\frac{5}{2}}}$$

$\frac{5}{2} \cdot \frac{7}{2} \cdot \frac{9}{2}$

$\frac{315}{215}$ / 2

$$\frac{\partial^2 V}{\partial x \partial z} = -\int 3 \frac{a_0 + \rho\cos(\alpha+\lambda)}{\left(\rho^2 + a_0^2 + 2 a_0 \rho \cos(\alpha+\lambda)\right)^{\frac{5}{2}}} \rho \Big(g + a \sin(\alpha+\lambda) + b \cos(\alpha+\lambda) + A \sin 2(\alpha+\lambda) + B \cos 2(\alpha+\lambda) \Big) d\alpha .$$

$$\frac{1}{(1+x)^{\frac{5}{2}}} = 1 - \frac{5}{2}x + \frac{35}{8}x^2 - \frac{315}{48}x^3 + \frac{3465}{384}x^4$$

$$\frac{\partial^2 V}{\partial x \partial z} = -3 \frac{a_0 \rho}{(\rho^2 + a_0^2)^{\frac{5}{2}}} \int \left(1 - 5\frac{a_0 \rho \cos(\alpha+\lambda)}{\rho^2 + a_0^2} + \frac{35}{2}\left(\frac{a_0 \rho}{\rho^2 + a^2}\right)^2 \cos^2(\alpha+\lambda) - \frac{315}{6}\left(\frac{a_0 \rho}{\rho^2 + a^2}\right)^3 \cos^3(\alpha+\lambda) + \frac{3465}{24}\left(\frac{a\rho}{\rho^2+a^2}\right)^4 \cos^4(\alpha+\lambda)\right)$$

$$\frac{\left(g + a \sin(\alpha+\lambda) + b\cos(\alpha+\lambda) + A \sin 2(\alpha+\lambda) + B \cos 2(\alpha+\lambda)\right) d\alpha}{\left(1 + \frac{\rho}{a_0}\cos(\alpha+\lambda)\right)}$$

$$\int \cos(\alpha+\lambda) d\alpha = 0 \qquad \int \sin(\alpha+\lambda) d\alpha = 0 \qquad \int \cos(\alpha+\lambda)\sin 2(\alpha+\lambda) = 0$$

$$\int \cos^2(\alpha+\lambda) d\alpha = \pi \qquad \int \cos(\alpha+\lambda)\sin(\alpha+\lambda) d\alpha = 0 \qquad \int \cos(\alpha+\lambda)\cos 2(\alpha+\lambda) = 0$$

$$\int \cos^3(\alpha+\lambda) d\alpha = 0 \qquad \int \cos^2\alpha \sin\alpha = 0 \qquad \int \cos^2\alpha \sin 2\alpha = 0 \qquad \int \cos^2\alpha \cos 2\alpha = \frac{\pi}{2}$$

$$\int \cos^4(\alpha+\lambda) d\alpha = \frac{3}{4}\pi \qquad \int \cos^3\alpha \sin\alpha = 0 \qquad \int \cos^3\alpha \sin 2\alpha = 0 \qquad \int \cos^3\alpha \cos 2\alpha = 0$$

$$\int \cos^5(\alpha+\lambda) d\alpha = 0 \qquad \int \cos^4\alpha \sin\alpha = 0 \qquad \int \cos^4\alpha \sin 2\alpha = 0 \qquad \int \cos^4\alpha \cos 2\alpha = \frac{\pi}{2}$$

$$\int \cos^6(\alpha+\lambda) d\alpha = \frac{5}{8}\pi \qquad \int \cos^5\alpha \sin\alpha = 0 \qquad \int \cos^5\alpha \sin 2\alpha = 0 \qquad \int \cos^5\alpha \cos 2\alpha = 0$$

$$\frac{\partial V}{\partial x \partial z} = -3\frac{C\pi}{\sqrt{\rho^2+a_0^2}}\Big\{\Big(2 - 5\frac{\rho}{a_0}C + \frac{35}{2}C^2 - \frac{315}{8}\frac{\rho}{a_0}C^3 + \frac{3465}{32}C^4\Big)J_1$$

$$+ \Big(-\frac{\rho}{a_0} + 5C - \frac{105}{8}\frac{\rho}{a_0}C^2 + \frac{315}{8}C^3 - \frac{17325}{192}\frac{\rho}{a_0}C^4\Big)\sin\lambda$$

$$- \Big(\quad \Big)\cos\lambda$$

$$+ \Big\{\frac{5}{2}\frac{\rho}{a_0}C - \frac{35}{4}C^2 + \frac{315}{12}\frac{\rho}{a_0}C^3 - \frac{3465}{48}C^4\Big\}\sin 2\lambda$$

$$- \Big\{ \quad \Big\} \cos 2\lambda$$

$$C = \frac{a_0\rho}{\rho^2+a_0^2} \qquad a_0 = 18 \qquad \rho = 3{,}667.$$

$$C = 0{,}1956 \qquad \frac{\rho}{a_0} = 0{,}2037$$

A₇

$$A = r_1 a_1 + r_2 a_2 + r_3 a_3 + r_4 a_4$$

$$B = r_2 a_1 + r_3 a_2 + r_4 a_3 + r_1 a_4$$

$$C = r_3 a_1 + r_4 a_2 + r_1 a_3 + r_2 a_4$$

$$\boxed{I} = r_4 a_1 + r_1 a_2 + r_2 a_3 + r_3 a_4$$

egyenletrendszer megoldása, ha

$$r_2 = r_4$$

$$a_1 = \frac{(A-C)2r_2^2 + (r_1+r_3)(r_3 C - r_1 A) + (B+\alpha) r_2 (r_1 - r_3)}{(r_1-r_3)\{4r_2^2 - (r_1+r_2)^2\}}$$

$$a_2 = \frac{(\alpha - B)2r_2^2 + (r_1+r_3)(r_3 B - r_1 \alpha) + (A+C) r_2 (r_1 - r_3)}{(r_1-r_3)\{4r_2^2 - (r_1+r_2)^2\}}$$

$$a_3 = \frac{-(A-C)2r_2^2 + (r_1+r_3)(r_3 A - r_1 C) + (B+\alpha) r_2 (r_1 - r_3)}{(r_1-r_3)\{4r_2^2 - (r_1+r_2)^2\}}$$

$$a_4 = \frac{-(\alpha - B)2r_2^2 + (r_1+r_3)(r_3 \alpha - r_1 B) + (A+C) r_2 (r_1 - r_3)}{(r_1-r_3)\{4r_2^2 - (r_1+r_2)^2\}}$$

hol

$$r_1 = -\frac{3}{\left(a + \frac{4\sqrt{2}}{3\pi} R\right)^4} \quad ; \quad r_2 = -3\frac{a}{\left(a^2 + \frac{32}{9\pi^2} R^2\right)^{5/2}} \quad ; \quad r_3 = -\frac{3}{\left(a - \frac{4\sqrt{2}}{3\pi} R\right)^4}$$

Regulus A lap felül

$a = 18\,cm.$ $R = 5{\cdot}5\,cm$; $r_1 = -14{\cdot}572.10^{-6}$; $r_2 = -26{\cdot}309.10^{-6}$; $r_3 = -64{\cdot}264.10^{-6}$

$A = -70$; $B = -68$; $C = -94$; $\alpha = -103$

$a_1 = +811844$

$a_2 = +351678$

$a_3 = +328859$

$a_4 = +1056020$

Regulus B lap felül

$A = +3$, $B = -54$, $C = -86$, $\alpha = -29$

$a_1 = +1211227$

$a_2 = +567247$

$a_3 = -580409$

$a_4 = +64147$

$$X = \alpha\frac{\partial^2 u}{\partial x^2} + \beta\frac{\partial^2 u}{\partial x\partial y} + \gamma\frac{\partial^2 u}{\partial x\partial z}$$

$$Y = \alpha\frac{\partial^2 u}{\partial x\partial y} + \beta\frac{\partial^2 u}{\partial y^2} + \gamma\frac{\partial^2 u}{\partial y\partial z}$$

$$Z = \alpha\frac{\partial^2 u}{\partial x\partial z} + \beta\frac{\partial^2 u}{\partial y\partial z} - \gamma\frac{\partial^2 u}{\partial x^2} - \gamma\frac{\partial^2 u}{\partial y^2}$$

III. $\quad \alpha Z + \gamma X = -\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)\alpha\gamma + 2\gamma\beta\frac{\partial^2 u}{\partial x\partial y} + \alpha\beta\frac{\partial^2 u}{\partial y\partial z} + (\alpha^2+2\gamma^2)\frac{\partial^2 u}{\partial x\partial z}$

II. $\quad \beta Z + 2\gamma Y = +\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)\beta\gamma + 2\gamma\alpha\frac{\partial^2 u}{\partial x\partial y} + \alpha\beta\frac{\partial^2 u}{\partial y\partial z} + (\beta^2+2\gamma^2)\frac{\partial^2 u}{\partial y\partial z}$

I. $\quad \alpha Y - \beta X = +\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x\partial z}\right)\alpha\beta + (\alpha^2-\beta^2)\frac{\partial^2 u}{\partial x\partial y} + \beta\gamma\frac{\partial^2 u}{\partial y\partial z} - \beta\gamma\frac{\partial^2 u}{\partial x\partial z}$

1) $\quad \left(y - \gamma\frac{\partial^2 u}{\partial y\partial z}\right)\alpha + \left(-x + \frac{\partial^2 u}{\partial x\partial z}\gamma\right)\beta - \left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)\alpha\beta - (\alpha^2-\beta^2)\frac{\partial^2 u}{\partial x\partial y} = 0$

2) $\quad \left(z - \frac{\partial^2 u}{\partial x\partial z}\alpha\right)\beta + \left(2y - 2\frac{\partial^2 u}{\partial x\partial y}\alpha\right)\gamma - \left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)\beta\gamma - (\beta^2+2\gamma^2)\frac{\partial^2 u}{\partial y\partial z} = 0$

$$X' = X_0 + \xi$$

$$Z = Z_0 + \zeta$$

$$\frac{\partial^2 u}{\partial z^2} = -\frac{\partial^2 u}{\partial x^2} - \frac{\partial^2 u}{\partial y^2}$$

$$= -\frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial x^2} - 2\frac{\partial^2 u}{\partial x^2}$$

$$\xi = kX_0 \frac{\partial^2 u}{\partial x^2} + kZ_0 \frac{\partial^2 u}{\partial x \partial z}$$

$$\xi = kX_0 \frac{\partial^2 u}{\partial x \partial z} + kZ_0 \frac{\partial^2 u}{\partial z^2} = kX_0 \frac{\partial^2 u}{\partial x \partial z} - kZ_0\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right) + 2kZ_0 \frac{\partial^2 u}{\partial x^2}$$

$$k\frac{\partial^2 u}{\partial x^2} = \frac{\xi}{X_0} - k\frac{Z_0}{X_0}\frac{\partial^2 u}{\partial x \partial z}$$

$$\xi = kX_0 \frac{\partial^2 u}{\partial x \partial z} - kZ_0\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right) - 2\xi\frac{Z_0}{X_0} + 2k\frac{Z_0^2}{X_0}\frac{\partial^2 u}{\partial x \partial z}$$

$$\xi + 2\xi\frac{Z_0}{X_0} = kX_0\left(1 + 2\frac{Z_0^2}{X_0^2}\right)\frac{\partial^2 u}{\partial x \partial z} - kZ_0\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)$$

$$\frac{Z_0}{X_0} = tg\, i_0$$

$$Z + 2\, tg\, i_0 X' = Z_0 + 2 tg\, i_0 X_0 + kX_0\left(1 + 2\frac{Z_0^2}{X_0^2}\right)\frac{\partial^2 u}{\partial x \partial z} - kZ_0\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)$$

$$Z + 2\, tg\, i_0 X' = 3Z_0 + kX_0\left\{\left(1 + 2tg^2 i_0\right)\frac{\partial^2 u}{\partial x \partial z} - tg\, i_0\left(\frac{\partial^2 u}{\partial y^2} - \frac{\partial^2 u}{\partial x^2}\right)\right\}$$

$$k = \frac{\mu}{66.6}$$

$$V = 3Z_0 - 2X\, tg\, i_0 + \{\quad\} kX_0 - Z$$

$[aa] = +207$	$[bb] = +4,41731$	$[cc] = +61605$
$[ab] = -30,23874$	$[bc] = -55,642$	$[cl] = -49,735$
$[ac] = +377,91$	$[bl] = +3,97192$	
$[al] = -27,18987$		

Kürschák

Megoldandó:

$$(A_1 + B_1 z)x + (C_1 + D_1 z)y + E_1 xy + F_1(x^2 - y^2) = 0$$

$$(A_2 + B_2 z)x + \cdots = 0$$

$$(A_3 + B_3 z)x + \cdots = 0$$

Innen:

$$x : y : xy : (x^2 - y^2) = X : Y : U : V$$

a hol:

$$X = + \begin{vmatrix} C_1 + D_1 z & E_1 & F_1 \\ C_2 + D_2 z & E_2 & F_2 \\ C_3 + D_3 z & E_3 & F_3 \end{vmatrix} \qquad Y = - \begin{vmatrix} A_1 + B_1 z & E_1 & F_1 \\ A_2 + B_2 z & E_2 & F_2 \\ A_3 + B_3 z & E_3 & F_3 \end{vmatrix}$$

$$U = + \begin{vmatrix} A_1 + B_1 z & C_1 + D_1 z & F_1 \\ A_2 + B_2 z & C_2 + D_2 z & F_2 \\ A_3 + B_3 z & C_3 + D_3 z & F_3 \end{vmatrix} \qquad V = - \begin{vmatrix} A_1 + B_1 z & C_1 + D_1 z & E_1 \\ A_2 + B_2 z & C_2 + D_2 z & E_2 \\ A_3 + B_3 z & C_3 + D_3 z & E_3 \end{vmatrix}$$

a hat z a következő negyedfokú egyenletből határozandó meg

1) $XYV - U(X^2 - Y^2) = 0.$

Tehát először megoldandó (1), o ajután xet és yt a

2) $$y = \frac{U}{X} \quad \text{és} \quad x = \frac{U}{Y}$$

egyenletek adják meg.

$$X_\xi = \alpha \frac{\partial^2 u}{\partial \xi^2} + \beta \frac{\partial^2 u}{\partial x \partial y} + \gamma \frac{\partial^2 u}{\partial x^2}$$

$$Y = \alpha \frac{\partial^2 u}{\partial x \partial y} + \beta \frac{\partial^2 u}{\partial y^2} + \gamma \frac{\partial^2 u}{\partial y \partial x}$$

$$\beta X - \alpha Y = \alpha\beta\left(\frac{\partial^2 u}{\partial x^2} - \frac{\partial^2 u}{\partial y^2}\right) + (\beta^2 - \alpha^2)\frac{\partial^2 u}{\partial x \partial y} + \beta\gamma \frac{\partial^2 u}{\partial x^2} - \alpha\gamma \frac{\partial^2 u}{\partial y \partial x}.$$

$$0 = (A + Bz)x + (C + \gamma z)y + \xi x y + F(x^2 - y^2)$$

$x + iy$

$$\frac{\partial \varphi_c}{\partial x_c} \cdot \frac{1}{r} = \frac{1}{\cos\varphi} \frac{1}{r_c} \frac{1}{r} - \frac{x}{r} \operatorname{tg}\varphi - \frac{1}{r} \frac{x_c}{r_c}$$

$$\frac{\partial \varphi_c}{\partial y_c} \cdot \frac{1}{r} = \frac{x_c}{y_c}$$

$\frac{1}{r} = 1,5704997 \cdot 10^{-5}$

$\frac{1}{r\Delta\lambda} \cdot \text{rad} = 8,9982971 \cdot 10^{-5}$

φ	λ	$\cos\varphi$	$\operatorname{tg}\varphi$	x	$\Delta_\lambda x$	$\Delta_\varphi y$	$\Delta_\lambda y$	$\frac{\cos\varphi}{r_c} \frac{1}{r} \cdot 10^{9}$	$\frac{x}{r} \operatorname{tg}\varphi \cdot 10^{5}$	$\frac{x_c}{r_c} \frac{1}{r} \cdot 10^{5}$	$\frac{y_c}{r_c} \frac{1}{r} \cdot 10^{5}$
+45	+20	+0,7071	+1	+22059	−4630	+840	+1649	+0,2099	+0,3464	−0,4166	+0,0756
+35	100	+0,8192	+0,7002	+31804	−5691	−331	−1557	−0,1704	+0,3497	−0,5721	−0,0298
	105	"	"	31788	−5598	−508	−1658	−0,1821	+0,3496	−0,5037	−0,0457
	110	"	"	31700	−5428	−577	−1658	−0,1821	+0,3486	−0,4884	−0,0519
	115	"	"	31540	−5247	−683	−1583	−0,1739	+0,3468	−0,4721	−0,0615
	120	"	"	31243	−4960	−756	−1329	−0,1460	+0,3436	−0,4463	−0,0680
	125	"	"	30928	−4522	−740	−960	−0,1054	+0,3401	−0,4069	−0,0666
	130	"	"	30700	−4232	−907	−367	−0,0403	+0,3376	−0,3808	−0,0816
	135	"	"	30339	−3760	−1113	+472	+0,0518	+0,3336	−0,3383	−0,1002
	140	"	"	30083	−3425	−1321	+1217	+0,1337	+0,3308	−0,3082	−0,1189
	145	"	"	29824	−3107	−1263	+1673	+0,1838	+0,3280	−0,2796	−0,1136
	150	"	"	29558	−2913	−696	+1922	+0,2111	+0,3250	−0,2621	−0,0626
	155	"	"	29192	−2809	−991	+2020	+0,2219	+0,3210	−0,2528	−0,0892
	160	"	"	28791	−2768	−963	+2057	+0,2259	+0,3166	−0,2491	−0,0867
−40°	270	+0,7660	−0,8391	26688	+1299	−1585	+648	+0,0761	−0,3517	+0,1169	−0,1426
	275	"	"	27040	+1231	−1472	−116	−0,0136	−0,3563	+0,1108	−0,1325
	280	"	"	27102	+1076	−1391	−996	−0,1170	−0,3572	+0,0968	−0,1252
	285	"	"	27122	+383	−1485	−1627	−0,1911	−0,3574	+0,0345	−0,1336
	290	"	"	27050	+35	−1363	−2145	−0,2520	−0,3565	+0,0031	−0,1226
	295	"	"	26962	−162	−1493	−2660	−0,3125	−0,3553	−0,0146	−0,1343
	300	"	"	26897	−428	−1540	−3056	−0,3590	−0,3518	−0,0385	−0,1386
	305	"	"	26440	−482	−1465	−3330	−0,3912	−0,3484	−0,0434	−0,1318
	310	"	"	26125	−560	−1328	−3306	−0,3884	−0,3443	−0,0504	−0,1195

				$\Delta X_{\frac{1}{2}}$	$\frac{1}{\omega\rho}\frac{\partial \varepsilon}{\partial x}\cdot 10^{9}$	$\rho g y \cdot 10^{9}$	$\frac{\partial \varepsilon}{\partial y}$
+45	+20			+ 835	+0,1063	− 0,0481	+0,0582
35	100			− 20	−0,0022	+ 0,0188	+0,0166
	105			− 104	−0,0114	+ 0,0097	−0,0017
	110			− 248	−0,0272	+0,0006	−0,0266
	115			− 457	−0,0502	−0,0086	−0,0588
	120			− 612	−0,0672	−0,0168	−0,0840
	125			− 543	−0,0596	−0,0232	−0,0828
	130			− 589	−0,0647	−0,0274	−0,0921
	135			− 617	−0,0678	−0,0272	−0,0950
	140			− 515	−0,0566	−0,0222	−0,0788
	145			− 525	−0,0577	−0,0138	−0,0715
	150			− 632	−0,0694	−0,0038	−0,0732
	155			− 767	−0,0843	+0,0073	−0,0770
	160			− 943	−0,1036	+0,0184	−0,0852
−45	270			+ 511	+0,0600	−0,1280	−0,0680
	275			+ 414	+0,0486	−0,1306	−0,0820
	280			+ 82	+0,0096	−0,1265	−0,1169
	285			− 52	−0,0061	−0,1175	−0,1236
	290			− 160	−0,0188	−0,1050	−0,1238
	295			− 353	−0,0415	−0,0892	−0,1307
	300			− 522	−0,0613	−0,0700	−0,1313
	305			− 572	−0,0672	−0,0490	−0,1162
	310			− 803	−0,0943	−0,0261	−0,1204

43m 29.2s	645	+ 6,5
44m 15.3s	660	3,8
43m 13.9s	645	3,5
43m 52.3s	645	13,1
42m 57.7s	630	12,9
43m 18.6s	645	4,6
42m 11.5s	630	2,9
42m 43.4s	630	10,9
43m 9.7s	645	2,4
43m 52.3s	645	13,1
42m 23.7s	630	5,9
43m 10.5s	645	2,6

$x = r\varphi\Delta\lambda \quad y = r\cos\varphi\,\Delta\lambda$

$$X' = X + \sin\varphi\,\delta\lambda\, Y - \delta\varphi\, Z$$

$$Y' = -\sin\varphi\,\delta\lambda\, X + Y - \cos\varphi\,\delta\lambda\, Z$$

$$Z' = X\delta\varphi + Y\cos\varphi\,\delta\lambda + Z$$

$$\frac{y}{r} + \frac{\partial z}{r\cos\varphi\,\partial\lambda}$$

$$\frac{x}{r} + \frac{\partial z}{r\partial\varphi}$$

$$\frac{\partial X'}{\partial x} = \frac{\partial X'}{\partial\varphi} = \frac{\partial X}{\partial\varphi} + \cos\varphi\,\delta\lambda\, Y + \sin\varphi\,\delta\lambda\frac{\partial Y}{\partial\varphi} - Z - \delta\varphi\frac{\partial Z}{\partial\varphi}$$

$$r\cos\varphi\frac{\partial X'}{\partial y} = \frac{\partial X'}{\partial\lambda} = -\sin\varphi\, X - \sin\varphi\,\delta\lambda\frac{\partial X}{\partial\lambda} + \frac{\partial Y}{\partial\lambda} - \cos\varphi\, Z - \cos\varphi\,\delta\lambda\frac{\partial Z}{\partial\lambda}$$

$$\frac{\partial X'}{\partial\lambda} = \frac{\partial X}{\partial\lambda} + \sin\varphi\, Y + \sin\varphi\,\delta\lambda\frac{\partial Y}{\partial\lambda} - \delta\varphi\frac{\partial Z}{\partial\lambda}$$

$$\frac{\partial Y'}{\partial\varphi} = -\cos\varphi\,\delta\lambda\, X - \sin\varphi\,\delta\lambda\frac{\partial X}{\partial\varphi} + \frac{\partial Y}{\partial\varphi} + \sin\varphi\,\delta\lambda\, Z - \cos\varphi\,\delta\lambda\frac{\partial Z}{\partial\varphi}$$

$$\frac{\partial X}{\partial\lambda}\frac{1}{\cos\varphi} + \frac{\sin\varphi}{\cos\varphi}Y = \frac{\partial Y}{\partial\varphi}$$

$y = r\cos\varphi\,\Delta\lambda$

$$\frac{\partial Y}{\partial\varphi}\cos\varphi = \frac{\partial X}{\partial\lambda} + Y\sin\varphi$$

Mentén $\Delta\lambda\Delta\varphi$ felületi körön

$$= r\Delta\lambda\Delta\varphi\left(\frac{\partial Y}{\partial\varphi}\cos\varphi - \frac{\partial X}{\partial\lambda} - Y_0\sin\varphi\right)$$

$\varphi = 46°51'$ az alapi transzlációnál

$$r\Delta\lambda\Delta\varphi\,(-0{,}000\,686\,1)$$

$$\frac{\partial X'}{\partial x} = \frac{\partial X}{\partial x} + \frac{Z}{r}$$

$$\frac{\partial Y'}{\partial y} = -\frac{X\operatorname{tg}\varphi}{r} + \frac{\partial Y}{\partial y} - \frac{Z}{r}$$

$$\frac{\partial Y}{\partial\lambda} - \frac{\partial X}{\partial\lambda} = -\frac{2Z}{r} - \frac{X\operatorname{tg}\varphi}{r} + \frac{1}{r\sin\varphi}\frac{\partial Y}{\partial\lambda} - \frac{1}{r}\frac{\partial X}{\partial\varphi}$$

$$\frac{\partial X}{\partial z} = -\frac{0{,}000\,078\,885\,3}{0{,}000\,290\,4} \qquad \frac{\partial Y}{\partial\lambda} = \frac{0{,}000\,027\,694\,0}{0{,}000\,290\,4}$$

$-0{,}271\,177$ $\qquad +0{,}095\,198$

$$\frac{\partial K}{\partial \varphi} = +a\sin\varphi + b\cos\varphi\sin\vartheta - c\cos\varphi\cos\vartheta + 2e\sin 2\varphi\sin\vartheta - f\cos 2\varphi\sin 2\vartheta$$
$$\varphi - 2g\sin 2\varphi\cos\vartheta - i\cos 2\varphi\cos 2\vartheta - 2k\cos 2\varphi$$

$$\frac{\partial K}{\partial \chi} = +\frac{1}{2}k + 3a\sin\varphi - \frac{7}{2}k\cos 2\varphi + 3b\cos\varphi\sin\vartheta - 3c\cos\varphi\cos\vartheta + \frac{7}{2}e\sin 2\varphi\sin\vartheta$$
$$- \frac{7}{4}f\cos 2\varphi\sin 2\vartheta - \frac{3}{4}f\sin 2\vartheta - \frac{7}{2}g\sin 2\varphi\cos\vartheta - \frac{7}{4}i\cos 2\varphi\cos 2\vartheta$$
$$- \frac{3}{4}i\cos 2\vartheta$$

$$r\cos\varphi\frac{\partial \varphi}{\partial \chi} = +\frac{3}{2}a\sin 2\varphi + 3b\cos^2\varphi\sin\vartheta - 3c\cos^2\varphi\cos\vartheta + 5e\sin\varphi\cos^2\varphi\sin\vartheta$$
$$- f\cos\varphi\sin 2\vartheta\left(\frac{3}{2} + 2\cos^2\varphi\right) - 5g\sin\varphi\cos^2\varphi\cos\vartheta$$
$$- i\cos\varphi\cos 2\vartheta\left(\frac{3}{2} + 2\cos^2\varphi\right) + k\cos\varphi\left(4 - 5\cos^2\varphi\right)$$

$$r\frac{\partial X}{\partial x} = \frac{\partial X}{\partial \varphi} - Z$$

$$r\frac{\partial Y'}{\partial y} = -X\sin\varphi - Z + \frac{\partial Y}{\partial \lambda}\frac{1}{\cos\varphi}$$

$$r\frac{\partial X'}{\partial y} = \frac{1}{\cos\varphi}\frac{\partial X}{\partial \lambda} + Y\sin\varphi$$

$$r\frac{\partial Y'}{\partial x} = +\frac{\partial Y}{\partial \varphi}.$$

$$\frac{\partial X'}{\partial \lambda} = \frac{1}{r}\frac{\partial X}{\partial \lambda} - \frac{Z}{r}.$$

$$r\Delta\lambda\cos\varphi$$

$$\frac{\partial X}{\partial \varphi} = +a\sin\varphi + b\cos\varphi\sin\lambda - c\cos\varphi\cos\lambda$$
$$+2e\sin 2\varphi\sin\lambda - f\cos 2\varphi\sin\lambda - 2g\sin 2\varphi\cos\lambda - i\cos 2\varphi\cos\lambda - 2k\cos 2\varphi$$

$$r\frac{\partial X'}{\partial x} = +\frac{1}{2}k + 3a\sin\varphi - \frac{7}{2}k\cos 2\varphi + 3b\cos\varphi\sin\lambda - 3c\cos\varphi\cos\lambda$$
$$+\frac{7}{2}e\sin 2\varphi\sin\lambda - \frac{7}{2}g\sin 2\varphi\cos\lambda - \frac{3}{4}f\sin\lambda - \frac{3}{4}i\cos\lambda$$
$$-\frac{7}{4}f\cos 2\varphi\sin\lambda - \frac{7}{4}i\cos 2\varphi\cos\lambda.$$

$$\frac{\partial Y}{\partial \lambda} = +b\sin\lambda - c\cos\lambda + e\sin\varphi\sin\lambda - 2f\cos\varphi\sin\lambda - g\sin\varphi\cos\lambda - 2i\cos\varphi\cos\lambda$$

$$r\cos\varphi\frac{\partial Y}{\partial y} = +\frac{3}{2}a\sin 2\varphi + \frac{1}{2}b\sin\lambda + \frac{3}{2}b\sin\lambda\cos 2\varphi - \frac{1}{2}c\cos\lambda - \frac{3}{2}c\cos\lambda\cos 2\varphi + 5e\sin\lambda\sin\varphi\cos^2\varphi$$
$$-f\cos\varphi\sin 2\lambda - \frac{5}{2}f\sin\lambda\cos^3\varphi - 5g\cos\lambda\sin\varphi\cos^2\varphi - i\cos\lambda\cos\varphi - \frac{5}{2}i\cos\lambda\cos^3\varphi$$
$$+\frac{k}{2}\cos\varphi(1 + \sin 2\varphi - 3\cos 2\varphi)$$

$$r\frac{dY'}{\partial x} = -e\cos\lambda\cos\varphi - f\sin\varphi\cos 2\lambda - g\cos\varphi\sin\lambda + i\sin\varphi\sin\lambda$$

$$r\cos\varphi\frac{\partial y}{\partial\gamma} = -x\sin\varphi - z\cos\varphi + \frac{\partial y}{\partial\lambda}.$$

$$\begin{aligned}
&+a\sin\varphi\cos\varphi - b\sin^2\varphi\sin\lambda + c\sin^2\varphi\cos\lambda + e\sin\varphi\cos2\varphi\sin\lambda + \tfrac{1}{2}f\sin\varphi\sin2\varphi\sin\lambda - g\sin\varphi\cos2\varphi\cos\lambda + \tfrac{1}{2}i\sin\varphi\sin2\varphi\cos2\lambda + k\sin\varphi\cos2\varphi\\
&+2a\sin\varphi\cos\varphi + 2b\cos^2\varphi\sin\lambda - 2c\cos^2\varphi\cos\lambda + \tfrac{3}{2}e\cos\varphi\sin2\varphi\sin\lambda - \tfrac{3}{2}f\cos^2\varphi\sin2\lambda - \tfrac{3}{2}g\cos\varphi\sin2\varphi\cos\lambda - \tfrac{3}{2}i\cos^2\varphi\cos2\lambda + 2k\cos\varphi\\
&\qquad + b\sin\lambda - c\cos\lambda + e\sin\varphi\sin\lambda - 2f\cos\varphi\sin2\lambda - g\sin\varphi\cos\lambda - 2i\cos\varphi\cos2\lambda - 3k\cos^3\varphi.\\
&+\tfrac{3}{2}a\sin\varphi\cos\varphi + 3b\sin\lambda\cos^2\varphi - 3c\cos\lambda\cos^2\varphi + e\sin\varphi\sin\lambda\,5\cos^2\varphi - f\cos\varphi\sin2\lambda\left(1+\tfrac{5}{2}\cos^2\varphi\right) - g\sin\varphi\cos\lambda\,5\cos^2\varphi - i\cos\varphi\cos2\lambda\left(1+\tfrac{5}{2}\cos^2\varphi\right)\\
&\qquad +k\left(4-5\cos^2\varphi\right)\cos\varphi
\end{aligned}$$

$$\begin{aligned}
&a\sin\varphi + b\cos\varphi\sin\lambda - c\cos\varphi\cos\lambda + 2e\sin2\varphi\sin\lambda - f\cos2\varphi\sin2\lambda - 2g\sin2\varphi\cos\lambda - i\cos2\varphi\cos2\lambda - 2k\cos2\varphi\\
&+2a\sin\varphi + 2b\cos\varphi\sin\lambda - 2c\cos\varphi\cos\lambda + \tfrac{3}{2}e\sin2\varphi\sin\lambda - \tfrac{3}{2}f\cos^2\varphi\sin2\lambda - \tfrac{3}{2}g\sin2\varphi\cos\lambda - \tfrac{3}{2}i\cos^2\varphi\cos2\lambda + 2k - 3k\cos^2\varphi.
\end{aligned}$$

$$\begin{aligned}
&+3a\sin\varphi + 3b\cos\varphi\sin\lambda - 3c\cos\varphi\cos\lambda + \tfrac{7}{2}e\sin2\varphi\sin\lambda - f\sin2\lambda\left(\tfrac{7}{2}\cos^2\varphi-1\right) - \tfrac{7}{2}g\sin2\varphi\cos\lambda - i\cos2\lambda\left(\tfrac{7}{2}\cos^2\varphi-1\right) + k\left(4-7\cos^2\varphi\right)
\end{aligned}$$

80

Gy8 — L — Gy5 — kerítés

	φ	λ
80	53' 23"	11' 10"
Gy8	51' 30'	9' 41'
Gy5	51' 16	12' 46"
	46°	37° .

$\varphi - \varphi_0 = +42'$

$\lambda - \lambda_0 = -109'$

$\varphi = 46° 52' \ldots$

$\lambda = 37° 11' \ldots$

$X = +0,21430$

$Y = -0,02396$

$Z = +0,39775$

$r \frac{\partial x'}{\partial x} = \frac{\partial X}{\partial \varphi} - Z$

$r \frac{\partial y'}{\partial y} = -X \operatorname{tg}\varphi - Z + \frac{\partial y}{\partial \lambda} \cos\varphi$

$+ \frac{\partial x'}{\partial y} = \frac{1}{\cos\varphi} \frac{\partial X}{\partial \lambda} + \operatorname{tg}\varphi \, Y$

$r \frac{\partial y'}{\partial x} = + \frac{\partial y}{\partial \varphi}$

$r \frac{\partial x'}{\partial x} = -0,27118 + 0,39775 = +0,12657$ $\quad = -0,66893$

$r \frac{\partial y'}{\partial y} = -0,22874 - 0,39775 + 0,13924 = -0,48725$

$r \frac{\partial x'}{\partial y} = -0,02557 + 0,06976 = +0,04419$ $\quad 2557$

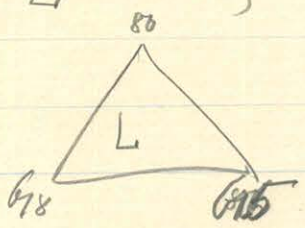
$r \frac{\partial y'}{\partial x} = +0,04180 =$ $\quad \Big\} = +0,04265$

$r = 6367000$

$\frac{\partial S'}{\partial s} \cdot 10^3$	$\frac{\partial N'}{\partial n}$	$\frac{\partial x'}{\partial x}$	$\frac{\partial y'}{\partial y}$	$\frac{\partial y'}{\partial x'} \cdot \frac{\partial x'}{\partial x}$	$\frac{\partial x'}{\partial y}$	R	λ
−0,4095	−1,4063	−1,0505	−0,7652	+0,2853	+0,0670	0,9968	86° 8'

$\frac{Z}{r} = 0,6257$ $\quad \frac{XZY}{r} = 0,2538$

I. harmony



	X'	Y'
80	0,21471	−0,02370
615	0,21471	−0,02341
618	0,21476	−0,02383

(változó redukált értékek)

80 | −5 = +360x + 188z = −2,2 −2,9
| +13 = +188y + 360z = +19,3 −5,5
615 | −5 = −53x + 398z = +0,3 −6,1
| +42 = +398y − 53z = +40,8 +0,8

= −1535 a1 = −1535
= +19160 b1 = +19160
= −1980 c1 = −476

+132409x + 46586z = −1535
+193748x + 130987z = −21140
+15 7748x + 68167z = −2246

+1241.712z = −18894

z = −0,015216

y = +0,102550

x = −0,000623

+19160 −1535
~~+21140~~
+ 708,85 + 708,85
~~−2043~~1,15 − 826,15
+19868,85

$y^{63\,11}$

$\frac{\partial x}{\partial x} = -0,0624$ $\frac{\partial y}{\partial y} = +1,0255$ $\frac{\partial y}{\partial x} = -0,1522$

+1,0505 +0,7562 −0,0676
−0,6257 −0,6257
−0,2538

+0,363 +0,1796 −0,219

1ª iteráció: $\frac{\partial x}{\partial x} = +0,245$ $\frac{\partial y}{\partial y} = +0,844$ $\frac{\partial y}{\partial x} = -0,238$

1,051
688
363

1,782
986
796

$a = -3196$ $\quad b = +6023$ $\quad c = +2377$

$e = -1264$ $\quad f = -2415$ $\quad g = -5789$ $\quad i = -1265$

$k = -2250$

φ 45° $\quad \lambda = 20'$

$-e\,0{,}34 - \frac{3}{2} f\,0{,}64 + g\,0{,}94 - \frac{3}{2} i\,0{,}77 + k.$

$+400 + 2400 - 5400 + +1400 - 2250$

$-3000 - 0{,}03400 \quad -0{,}05$

$$r\left(\frac{\partial X}{\partial y} - \frac{\partial X}{\partial x}\right) = -X \operatorname{tg}\varphi + \frac{\partial y}{\partial \lambda}\frac{1}{\cos\varphi} - \frac{\partial x}{\partial \varphi}$$

$+ \Delta x \quad X = +22057$

$\Delta x \quad -630$

$\Delta y \quad +1649$

$\frac{\partial X}{\partial y} = -0{,}03610$

$\frac{1}{\cos\varphi}\frac{\partial y}{\partial \lambda} = +0{,}06767$

0,1745 / 6300 / 361

5235

10650

8725

10470

1800

550

0,06767

3610

0,10377

22057

0,11682

0,1745

7015

12215

122150

1223715

1204 / 8350 / +0,06767

7404

9460

8638

8220

7404

8160

220

170

0, 135

36

+0,050

MAGYAR TUDOMÁNYOS AKADÉMIA KÖNYVTÁRA

$+1264 \sin\lambda + 3602 \sin\lambda - 5789 \cos\lambda + 1898 \cos 2\lambda - 2250$

$\lambda = 0° \quad -6041 \quad \lambda = 90° \quad -2889$

$\lambda = 180 \quad +5527 \quad \lambda = 270° \quad -3417$

$$\frac{\partial \chi}{\partial \eta} = +12\delta\gamma\omega\varphi\omega\lambda + 2\nu\varepsilon\,\omega\gamma\omega\lambda + 5\gamma 8\gamma\omega\varphi\omega\lambda - 12\delta\omega\gamma\omega\lambda$$

$$\gamma(\,) = \cdot +12\delta\gamma\,\omega\omega\gamma\omega\lambda + 2\nu\varepsilon(2-\omega^2\varphi)\omega\lambda - 5\gamma 8\gamma\,\omega\omega\varphi\omega\lambda$$
$$+12\delta 5(2-\omega^2\varphi)\omega\lambda - \gamma 5\nu\omega\,\omega^2\varphi\,.$$

$$\frac{\partial \chi}{\partial \eta} = +12\delta\gamma\omega\varphi\omega\lambda + 2\nu\varepsilon\,\omega\gamma\omega\lambda + 5\gamma 8\gamma\omega\varphi\omega\lambda - 12\delta\omega\gamma\omega\lambda$$

$\lambda\eta\gamma$

$0,10774\text{Z}-2$	~~$9,1507$~~			
$8,8039\text{E}$	$0,3829\text{I}2-2$	$0,76260\nu-2$	~~$19\text{E}0$~~	
$0,2\text{I}778\Gamma-2$	$8,8039\text{E}$	$8,8039\text{E}$	$0,10209\text{I}-2$	$0,\delta\Gamma 2\text{I}3-2$
	$0,5789\Gamma\Gamma-2$	$99\Gamma 86\nu 2-2$	$8,8039\text{E}$	$8,8039\text{E}$
			$0,29812\text{Z}-2$	$0,98\nu 92\Gamma\text{I}-2$
$0,0198\Gamma\text{I}$	$0,03792\text{B}$	$0,09090\text{I}6$	$0,0198\text{B}7$	$0,0706\text{I}3$

$$\left(X_0 + \frac{1}{i}\frac{\partial X}{\partial \varphi}\Delta\varphi\right) r\Delta\varphi \cdot - \left(X_0 + \frac{1}{i}\frac{\partial X}{\partial \varphi}\Delta\varphi + \frac{\partial X}{\partial \lambda}\Delta\lambda\right) r\Delta\varphi$$

$$- \frac{\partial X}{\partial \lambda}\Delta\lambda\Delta\varphi$$

$$+ \left(Y_0 + \frac{\partial Y}{\partial \varphi}\Delta\varphi + \frac{1}{i}\frac{\partial Y}{\partial \lambda}\Delta\lambda\right) \Delta\lambda r(\cos\varphi - \sin\varphi\,\Delta\varphi)$$

$$- \left(Y_0 + \frac{1}{i}\frac{\partial Y}{\partial \lambda}\Delta\lambda\right) \Delta\lambda r\cos\varphi \,.$$

$$+\frac{\partial X}{\partial \lambda}\Delta\lambda\Delta\varphi + \frac{\partial Y}{\partial \varphi}\Delta\varphi\Delta\lambda r\cos\varphi - r\Delta\lambda\Delta\varphi Y_0 \sin\varphi - r\Delta\lambda\Delta\varphi^2 \frac{\partial Y}{\partial \varphi}\sin\varphi$$

$$- \frac{1}{2} r\Delta\lambda^2 \sin\varphi\cos\varphi \frac{\partial Y}{\partial \varphi}$$

$$r\Delta\lambda\Delta\varphi\left(\frac{\partial Y}{\partial \varphi}\cos\varphi - \frac{\partial X}{\partial \lambda} - Y_0 \sin\varphi\right)$$

$$\varphi = 46^\circ 55'$$

$$r\Delta\lambda\Delta\varphi\left(+0{,}0411025\cos\varphi - 0{,}047644 + 0{,}023835\sin\varphi\right)$$

$$\begin{array}{r} 0{,}834460 - 1 \\ 0{,}613879 - 2 \\ \hline 0{,}448339 - 2 \end{array}$$

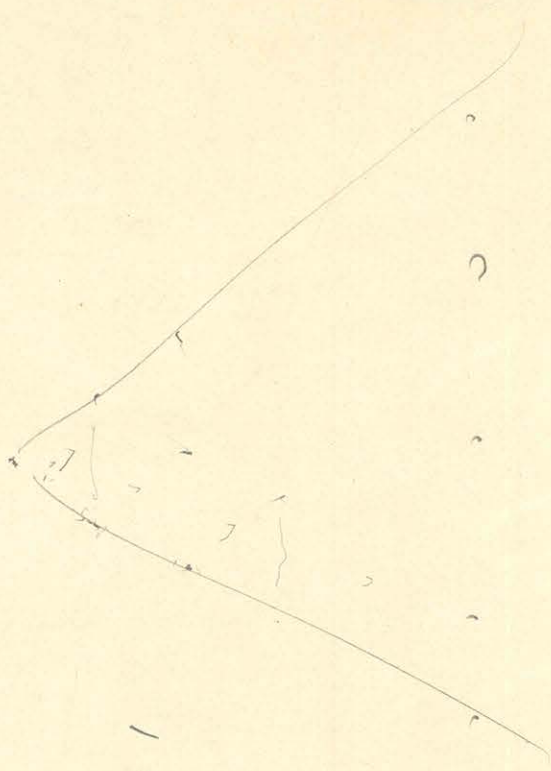
$$\begin{array}{r} 0{,}863508 - 1 \\ 0{,}368287 - 2 \\ \hline 0{,}231825 - 2 \end{array}$$

$$\begin{array}{r} 0{,}0280763 \\ 0{,}0170540 \\ \hline 0{,}0451303 \\ 47644 \\ \hline 0{,}0025641 \end{array}$$

$$\begin{array}{r} 0{,}000 \\ 0{,}00000009 \cdot 450 \\ 0{,}0000111 \\ \hline 0{,}0000097641 \end{array}$$

$$450 \cdot 0{,}0000025641$$

$$\cdot 10^{-14} \cdot 10^{7}$$



$$\frac{\partial X_n'}{\partial x} + \frac{\partial \xi'}{\partial x} = \frac{\partial X_n}{\partial x} + \frac{\partial \xi}{\partial x} - \frac{Z_n}{r} - \frac{\xi}{r}$$

$$\frac{\partial Y_n'}{\partial y} + \frac{\partial \zeta'}{\partial y} = -\frac{X_n}{r}\operatorname{tg}\varphi - \frac{\xi}{r}\operatorname{tg}\varphi - \frac{Z_n}{r} - \frac{\xi}{r} + \frac{\partial Y_n}{\partial y} + \frac{\partial \zeta}{\partial y}$$

hom $\pm( ) + \frac{2}{r}$.

0 a az egyik b az annuitás ?

$$\frac{\partial X_n}{\partial x}$$

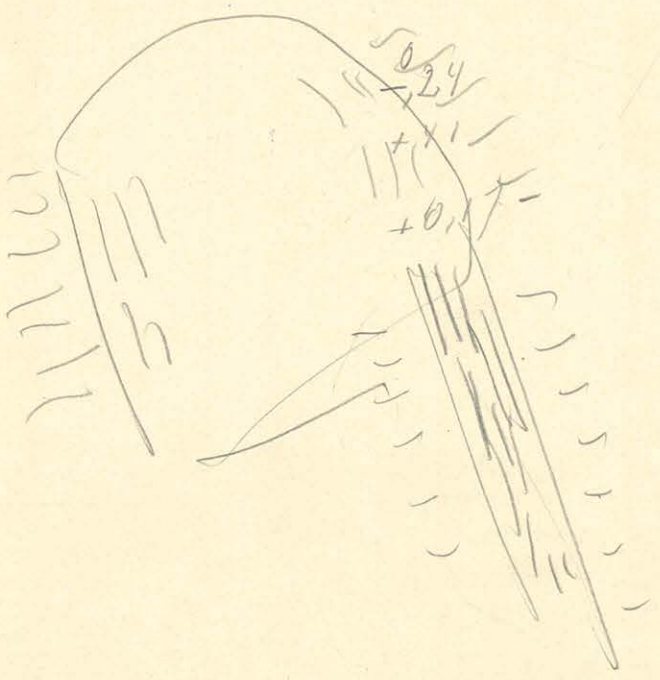
$$\frac{\partial X_n}{\partial x}$$

... 6s

$-0,27\overset{1}{1},18$
$\overset{2}{6}\,\overset{4}{7}^{8} - 0,41$
$-0,06.$

$6 \mid +0,\overset{12,5}{1}\overset{6}{7}\overset{2}{5}24$

$+0,022$
$\overline{0,866}$



	70	71	72	73	74	75	76	77	78	79	80
$1+n$	+ 538	+ 655	+ 482	- 339	- 6	+ 319	- 307	- 370	+ 480	+ 486	+ 340
$1-n$	+ 480	+ 523	+ 384	+ 213	+ 1065	+ 1267	+ 633	+ 199	+ 452	+ 377	+ 533
$2n$	+ 998	+ 1175	+ 866	- 126	+ 1056	+ 1586	+ 332	- 171	+ 932	+ 863	+ 873
$2n$	+ 78	+ 132	+ 98	- 552	- 1971	- 948	- 934	- 569	+ 28	+ 109	- 193

81.
- 13
+ 520
+ 507
- 533

$$A=\int\alpha_0 d\tau \qquad B=\int\beta_0 d\tau \qquad C=\int\gamma_0 d\tau$$

$$\int\gamma_0\xi_0 d\tau-\tfrac{1}{2}\int\alpha_0\xi_0 d\tau-\tfrac{1}{2}\int\beta_0\eta_0 d\tau=\mathcal{D}$$

$$\int\alpha_0\xi_0 d\tau+\int\gamma_0\xi_0 d\tau=\mathcal{E}\ ,\qquad \int\beta_0\xi_0 d\tau+\int\gamma_0\eta_0 d\tau=\mathcal{F}$$

$$\int\alpha_0\eta_0 d\tau+\int\beta_0\xi_0 d\tau=\mathcal{G}\ ,\qquad \int\alpha_0\xi_0 d\tau-\int\beta_0\eta_0 d\tau=\mathcal{H}$$

$$b=0 \qquad r^2=a^2+c^2$$

$$\frac{\partial^2 V}{\partial x\,\partial z}=\mathcal{C}\left(-\frac{3a}{r^5}+15\frac{ac}{r^7}\right)+\mathcal{D}\left(+\frac{45ac}{r^7}-\frac{105ac^3}{r^9}\right)$$

$$+\sin\lambda\left\{+B\left(+\frac{3c}{r^5}-15\frac{a^2c}{r^7}\right)+\cdots+\mathcal{F}\left(+\frac{12}{r^5}-\frac{105a^2c^2}{r^9}\right)\right.$$

$$\left.+\cos\lambda\left\{A\left(-\frac{3c}{r^5}+\frac{15a^2c}{r^7}\right)+\mathcal{E}\left(\frac{12}{r^5}-105\frac{a^2c^2}{r^9}\right)\right\}\right.$$

$$+\sin 2\lambda\left\{+\frac{1}{2}\mathcal{G}\left(-30\frac{ac}{r^7}+105\frac{a^3c}{r^9}\right)\right\}$$

$$+\cos 2\lambda\left\{-\frac{1}{2}\mathcal{H}\left(-30\frac{ac}{r^7}+105\frac{a^2c}{r^9}\right)\right\}$$

ha $\quad c=0$

$$\frac{\partial^2 V}{\partial x\,\partial z}=-3\mathcal{C}\frac{1}{a^4}+\mathcal{F}\frac{12}{a^5}\sin\lambda+\mathcal{E}\frac{12}{a^5}\cos\lambda$$

---

a $\xi^2\ \eta^2\ \xi$ Lyubel is determina : $b=0\quad c=0$.

$$\frac{\partial^2 V}{\partial x\,\partial z}=-\frac{3}{a^4}\int\gamma_0 d\tau-\frac{75}{a^6}\int\alpha_0\xi_0\xi_0 d\tau-\frac{75}{a^6}\int\beta_0\eta_0\xi_0 d\tau-\frac{45}{4}\frac{1}{a^6}\int\xi_0^2\gamma_0 d\tau-\frac{45}{4}\frac{1}{a^6}\int\eta_0^2\gamma_0 d\tau+\frac{45}{2}\frac{1}{a^6}\int\xi_0^2\gamma_0 d\tau$$

$$+\frac{12}{a^5}\left[\int\beta_0\xi_0 d\tau+\int\gamma_0\eta_0 d\tau\right]\sin\lambda+\frac{12}{a^5}\left[\int\alpha_0\xi_0 d\tau+\int\gamma_0\xi_0 d\tau\right]\cos\lambda$$

$$+\frac{15}{a^6}\left[\frac{5}{2}\int\xi_0\eta_0\gamma_0 d\tau-\int\alpha_0\eta_0\xi_0 d\tau-\int\beta_0\xi_0\xi_0 d\tau\right]\sin 2\lambda$$

$$+\frac{15}{a^6}\left[\int\alpha_0\xi_0\xi_0 d\tau-\int\beta_0\eta_0\xi_0 d\tau-\frac{5}{4}\int\xi_0^2\gamma_0 d\tau+\frac{5}{4}\int\eta_0^2\gamma_0 d\tau\right]\cos 2\lambda$$

1911 Febr. 14

2

$$V = \frac{\partial \frac{1}{r}}{\partial z}\int \gamma_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial z^2}\int \gamma_0 \xi_0 d\tau$$

$$+ \sin\lambda\left\{ - \frac{\partial \frac{1}{r}}{\partial x}\int \beta_0 d\tau + \frac{\partial \frac{1}{r}}{\partial y}\int \alpha_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial y \partial z}\left[\int \alpha_0 \xi_0 d\tau + \int \gamma_0 \xi_0 d\tau\right] - \frac{\partial^2 \frac{1}{r}}{\partial x \partial z}\left[\int \beta_0 \xi_0 d\tau + \int \gamma_0 \eta_0 d\tau\right]\right.$$

$$+ \cos\lambda\left\{ + \frac{\partial \frac{1}{r}}{\partial x}\int \alpha_0 d\tau + \frac{\partial \frac{1}{r}}{\partial y}\int \beta_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial y \partial z}\left[\int \beta_0 \xi_0 d\tau + \int \gamma_0 \eta_0 d\tau\right] - \frac{\partial^2 \frac{1}{r}}{\partial x \partial z}\left[\int \alpha_0 \xi_0 d\tau + \int \gamma_0 \xi_0 d\tau\right]\right.$$

$$+ \cos\lambda\left\{ - \frac{\partial^2 \frac{1}{r}}{\partial x^2}\int \alpha_0 \xi_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial y^2}\int \beta_0 \eta_0 d\tau \right\} + \sin^2\lambda\left\{ - \frac{\partial^2 \frac{1}{r}}{\partial x^2}\int \beta_0 \eta_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial y^2}\int \alpha_0 \xi_0 d\tau \right\}.$$

$$+ \frac{\sin 2\lambda}{2}\left\{\left(\frac{\partial^2 \frac{1}{r}}{\partial x^2} - \frac{\partial^2 \frac{1}{r}}{\partial y^2}\right)\left[\int \alpha_0 \eta_0 d\tau + \int \beta_0 \xi_0 d\tau\right]\right.$$

$$- \cos 2\lambda \frac{\partial^2 \frac{1}{r}}{\partial x \partial y}\left[\int \alpha_0 \eta_0 d\tau + \int \beta_0 \xi_0 d\tau\right] - \sin 2\lambda \frac{\partial^2 \frac{1}{r}}{\partial x \partial y}\left[\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right]$$

$$V = \frac{\partial \frac{1}{r}}{\partial z}\int \gamma_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial z^2}\left[\int \gamma_0 \xi_0 d\tau - \frac{1}{2}\int \alpha_0 \xi_0 d\tau - \frac{1}{2}\int \beta_0 \eta_0 d\tau\right]$$

$$+ \sin\lambda\left\{ - \frac{\partial \frac{1}{r}}{\partial x}\int \beta_0 d\tau + \frac{\partial \frac{1}{r}}{\partial y}\int \alpha_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial y \partial z}\left[\int \alpha_0 \xi_0 d\tau + \int \gamma_0 \xi_0 d\tau\right] - \frac{\partial^2 \frac{1}{r}}{\partial x \partial z}\left[\int \beta_0 \xi_0 d\tau + \int \gamma_0 \eta_0 d\tau\right]\right\}$$

$$+ \cos\lambda\left\{ + \frac{\partial \frac{1}{r}}{\partial x}\int \alpha_0 d\tau + \frac{\partial \frac{1}{r}}{\partial y}\int \beta_0 d\tau - \frac{\partial^2 \frac{1}{r}}{\partial y \partial z}\left[\int \beta_0 \xi_0 d\tau + \int \gamma_0 \eta_0 d\tau\right] - \frac{\partial^2 \frac{1}{r}}{\partial x \partial z}\left[\int \alpha_0 \xi_0 d\tau + \int \gamma_0 \xi_0 d\tau\right]\right\}$$

$$+ \sin 2\lambda\left\{ \frac{1}{2}\left(\frac{\partial^2 \frac{1}{r}}{\partial x^2} - \frac{\partial^2 \frac{1}{r}}{\partial y^2}\right)\left[\int \alpha_0 \eta_0 d\tau + \int \beta_0 \xi_0 d\tau\right] - \frac{\partial^2 \frac{1}{r}}{\partial x \partial y}\left[\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right]\right\}$$

$$+ \cos 2\lambda\left\{ - \frac{1}{2}\left(\frac{\partial^2 \frac{1}{r}}{\partial x^2} - \frac{\partial^2 \frac{1}{r}}{\partial y^2}\right)\left[\int \alpha_0 \xi_0 d\tau - \int \beta_0 \eta_0 d\tau\right] + \frac{\partial^2 \frac{1}{r}}{\partial x \partial y}\left[\int \alpha_0 \eta_0 d\tau + \int \beta_0 \xi_0 d\tau\right]\right\}$$

1911 Febr. 14

(1)

$$\xi = \xi_0 \cos\lambda - \eta_0 \sin\lambda \qquad \eta = \xi_0 \sin\lambda + \eta_0 \cos\lambda \qquad \zeta = \zeta_0$$

$$\alpha = \alpha_0 \cos\lambda - \beta_0 \sin\lambda \qquad \beta = \alpha_0 \sin\lambda + \beta_0 \cos\lambda \qquad \gamma = \gamma_0$$

$$\int \alpha \, d\tau = \cos\lambda \int \alpha_0 \, d\tau - \sin\lambda \int \beta_0 \, d\tau$$

$$\int \alpha \xi \, d\tau = \cos^2\lambda \int \alpha_0 \xi_0 \, d\tau + \sin^2\lambda \int \beta_0 \eta_0 \, d\tau - \sin\lambda\cos\lambda \left[\int \alpha_0 \eta_0 \, d\tau + \int \beta_0 \xi_0 \, d\tau \right]$$

$$\int \alpha \eta \, d\tau = \cos^2\lambda \int \alpha_0 \eta_0 \, d\tau - \sin^2\lambda \int \beta_0 \xi_0 \, d\tau + \sin\lambda\cos\lambda \left[\int \alpha_0 \xi_0 \, d\tau - \int \beta_0 \eta_0 \, d\tau \right]$$

$$\int \alpha \zeta \, d\tau = \cos\lambda \int \alpha_0 \xi_0 \, d\tau - \sin\lambda \int \beta_0 \xi_0 \, d\tau$$

$$\int \beta \, d\tau = \sin\lambda \int \alpha_0 \, d\tau + \cos\lambda \int \beta_0 \, d\tau$$

$$\int \beta \xi \, d\tau = \cos^2\lambda \int \beta_0 \xi_0 \, d\tau - \sin^2\lambda \int \alpha_0 \eta_0 \, d\tau + \sin\lambda\cos\lambda \left[\int \alpha_0 \xi_0 \, d\tau - \int \beta_0 \eta_0 \, d\tau \right]$$

$$\int \beta \eta \, d\tau = \cos^2\lambda \int \beta_0 \eta_0 \, d\tau + \sin^2\lambda \int \alpha_0 \xi_0 \, d\tau + \sin\lambda\cos\lambda \left[\int \alpha_0 \eta_0 \, d\tau + \int \beta_0 \xi_0 \, d\tau \right]$$

$$\int \beta \zeta \, d\tau = \cos\lambda \int \beta_0 \xi_0 \, d\tau + \sin\lambda \int \alpha_0 \xi_0 \, d\tau$$

$$\int \gamma \, d\tau = \int \gamma_0 \, d\tau$$

$$\int \gamma \xi \, d\tau = \cos\lambda \int \gamma_0 \xi_0 \, d\tau - \sin\lambda \int \gamma_0 \eta_0 \, d\tau$$

$$\int \gamma \eta \, d\tau = \cos\lambda \int \gamma_0 \eta_0 \, d\tau + \sin\lambda \int \gamma_0 \xi_0 \, d\tau$$

$$\int \gamma \zeta \, d\tau = \int \gamma_0 \xi_0 \, d\tau$$

$$V = \frac{\partial \frac{1}{r}}{\partial x} \int \alpha \, d\tau + \frac{\partial \frac{1}{r}}{\partial y} \int \beta \, d\tau + \frac{\partial \frac{1}{r}}{\partial z} \int \gamma \, d\tau + \frac{\partial^2 \frac{1}{r}}{\partial x^2} \left[\int \gamma \xi \, d\tau - \int \alpha \xi \, d\tau \right]$$

$$+ \frac{\partial^2 \frac{1}{r}}{\partial y^2} \left[\int \gamma \xi \, d\tau - \int \beta \eta \, d\tau \right] - \frac{\partial^2 \frac{1}{r}}{\partial x \partial y} \left[\int \alpha \eta \, d\tau + \int \beta \xi \, d\tau \right] - \frac{\partial^2 \frac{1}{r}}{\partial y \partial z} \left[\int \beta \zeta \, d\tau + \gamma \eta \, d\tau \right]$$

$$- \frac{\partial^2 \frac{1}{r}}{\partial z \partial x} \left[\int \alpha \xi \, d\tau + \int \gamma \xi \, d\tau \right]$$

1908 április 1)

hármas mágnes.

1	μ_1	l_1	$\varphi_\tau = 90°$	$\lambda_\tau = 0$	φ_1	λ_1
2	μ_2	l_2	$\varphi_\tau = 0$	$\lambda_\tau = 90°$	φ_2	λ_2
3	μ_3	l_3	$\varphi_\tau = 0$	$\lambda_\tau = 180°$	φ_3	λ_3

$$(\mu_1)_x = \mu_1 \cos\varphi \qquad (\mu_2)_x = -\mu_2 \sin\varphi \sin\lambda \qquad (\mu_3)_x = +\mu_3 \sin\varphi \cos\lambda$$

$$(\mu_1)_y = 0 \qquad (\mu_2)_y = \mu_2 \cos\lambda \qquad (\mu_3)_y = +\mu_3 \sin\lambda$$

$$(\mu_1)_z = -\mu_1 \sin\varphi \qquad (\mu_2)_z = -\mu_2 \sin\lambda \cos\varphi \qquad (\mu_3)_z = +\mu_3 \cos\lambda \cos\varphi$$

$$X = \mu_1 \cos\varphi \left\{ -\frac{1}{r^3} - \frac{3 l_1}{r^4} \left(\cos\varphi_1 \cos(\lambda_1 - \lambda) \cos\varphi + \sin\varphi_1 \sin\varphi \right) \right\}$$

$$- \mu_1 \sin\varphi \frac{3 l_1}{r^4} \left(-\sin\varphi \cos\varphi_1 \cos(\lambda_1 - \lambda) + \sin\varphi_1 \cos\varphi \right)$$

$$- \mu_2 \sin\varphi \sin\lambda \left\{ -\frac{1}{r^3} - \frac{3 l_2}{r^4} \left(\cos\varphi_2 \cos(\lambda_2 - \lambda) \cos\varphi + \sin\varphi_2 \sin\varphi \right) \right\}$$

$$- \mu_2 \sin\lambda \cos\varphi \frac{3 l_2}{r^4} \left(-\sin\varphi \cos\varphi_2 \cos(\lambda_2 - \lambda) + \sin\varphi_2 \cos\varphi \right)$$

$$+ \mu_3 \sin\varphi \cos\lambda \left\{ -\frac{1}{r^3} - \frac{3 l_3}{r^4} \left(\cos\varphi_3 \cos(\lambda_3 - \lambda) \cos\varphi + \sin\varphi_3 \sin\varphi \right) \right\}$$

$$+ \mu_3 \cos\lambda \cos\varphi \frac{3 l_3}{r^4} \left(-\sin\varphi \cos\varphi_3 \cos(\lambda_3 - \lambda) + \sin\varphi_3 \cos\varphi \right)$$

$$X = -\frac{\mu_1}{r^3} \cos\varphi + \frac{\mu_2}{r^3} \sin\varphi \sin\lambda - \frac{\mu_3}{r^3} \sin\varphi \cos\lambda$$

$$- \left\{ 3 \frac{\mu_1 l_1}{r^4} \sin\lambda_1 \cos\varphi_1 + 3 \frac{\mu_2 l_2}{r^4} \sin\varphi_2 \right\} \cos 2\varphi \sin\lambda$$

$$+ \left\{ \frac{3}{2} \frac{\mu_2 l_2}{r^4} \cos\lambda_2 \cos\varphi_2 - \frac{3}{2} \frac{\mu_3 l_3}{r^4} \sin\lambda_3 \cos\varphi_3 \right\} \sin 2\varphi \sin 2\lambda$$

$$- \left\{ 3 \frac{\mu_1 l_1}{r^4} \cos\lambda_1 \cos\varphi_1 - 3 \frac{\mu_3 l_3}{r^4} \sin\varphi_3 \right\} \cos 2\varphi \cos\lambda$$

$$+ 3 \frac{\mu_2 l_2}{r^4} \cos\varphi_2 \sin\lambda_2 \cdot \sin 2\varphi \sin^2\lambda$$

$$- 3 \frac{\mu_3 l_3}{r^4} \cos\varphi_3 \cos\lambda_3 \sin 2\varphi \cos^2\lambda$$

$$- 3 \frac{\mu_1 l_1}{r^4} \sin\varphi_1 \sin 2\varphi \,.$$

$$y = -\frac{3\mu_1 l_1}{r^4}\cos\varphi_1 \sin(\lambda_1-\lambda)\sin\varphi$$

$$-\frac{\mu_2}{r^3}\cos\lambda - \frac{3\mu_2 l_2}{r^4}\left(\cos\varphi_2 \cos(\lambda_2-\lambda)\cos\varphi + \sin\varphi_2 \sin\varphi\right)\cos\lambda$$

$$-\frac{3\mu_2 l_2}{r^4}\cos\varphi_2 \sin(\lambda_2-\lambda)\sin\lambda\cos\varphi$$

$$-\frac{\mu_3}{r^3}\sin\lambda - \frac{3\mu_3 l_3}{r^4}\left(\cos\varphi_3 \cos(\lambda_3-\lambda)\cos\varphi + \sin\varphi_3 \sin\varphi\right)\sin\lambda$$

$$+\frac{3\mu_3 l_3}{r^4}\cos\varphi_3 \sin(\lambda_3-\lambda)\cos\lambda\cos\varphi$$

$$y = -\frac{\mu_2}{r^3}\cos\lambda - \frac{\mu_3}{r^3}\sin\lambda$$

$$+\left(3\frac{\mu_1 l_1}{r^4}\cos\varphi_1 \cos\lambda_1 - 3\frac{\mu_3 l_3}{r^4}\sin\varphi_3\right)\sin\varphi\sin\lambda$$

$$-\left(3\frac{\mu_1 l_1}{r^4}\cos\varphi_1 \sin\lambda_1 + 3\frac{\mu_2 l_2}{r^4}\sin\varphi_2\right)\sin\varphi\cos\lambda$$

$$-\left(3\frac{\mu_2 l_2}{r^4}\cos\varphi_2 \sin\lambda_2 + 3\frac{\mu_3 l_3}{r^4}\cos\varphi_3 \cos\lambda_3\right)\cos\varphi\sin 2\lambda$$

$$-\left(3\frac{\mu_2 l_2}{r^4}\cos\varphi_2 \cos\lambda_2 - 3\frac{\mu_3 l_3}{r^4}\cos\varphi_3 \sin\lambda_3\right)\cos\varphi\cos 2\lambda$$

$$Z = +\frac{3\mu_1 l_1}{r^4}\cos\varphi\left(-\sin\varphi\cos\varphi_1\cos(\lambda_1-\lambda)+\sin\varphi_1\cos\varphi\right)$$

$$-\mu_1\sin\varphi\left\{\frac{2}{r^3}+\frac{6l_1}{r^4}\left(\cos\varphi_1\cos(\lambda_1-\lambda)\cos\varphi+\sin\varphi_1\sin\varphi\right)\right\}$$

$$-\frac{3\mu_2 l_2}{r^4}\sin\varphi\sin\lambda\left(-\sin\varphi\cos\varphi_2\cos(\lambda_2-\lambda)+\sin\varphi_2\cos\varphi\right)$$

$$+\frac{3\mu_2 l_2}{r^4}\cos\lambda\cos\varphi_2\sin(\lambda_2-\lambda)$$

$$-\mu_2\sin\lambda\cos\varphi\left\{\frac{2}{r^3}+\frac{6l_2}{r^4}\left(\cos\varphi_2\cos(\lambda_2-\lambda)\cos\varphi+\sin\varphi_2\sin\varphi\right)\right\}$$

$$+\frac{3\mu_3 l_3}{r^4}\sin\varphi\cos\lambda\left(-\sin\varphi\cos\varphi_3\cos(\lambda_3-\lambda)+\sin\varphi_3\cos\varphi\right)$$

$$+\frac{3\mu_3 l_3}{r^4}\sin\lambda\cos\varphi_3\sin(\lambda_3-\lambda)$$

$$+\mu_3\cos\lambda\cos\varphi\left\{\frac{2}{r^3}+\frac{6l_3}{r^4}\left(\cos\varphi_3\cos(\lambda_3-\lambda)\cos\varphi+\sin\varphi_3\sin\varphi\right)\right\}$$

$$Y = -\frac{2\mu_1}{r^3}\sin\varphi-\frac{2\mu_2}{r^3}\cos\varphi\sin\lambda+\frac{2\mu_3}{r^3}\cos\varphi\cos\lambda$$

$$+3\frac{\mu_1 l_1}{r^4}\sin\varphi_1\cos^2\varphi-\frac{6\mu_1 l_1}{r^4}\sin\varphi_1\sin^2\varphi+3\frac{\mu_2 l_2}{r^4}\cos\varphi_2\sin\lambda_2-3\frac{\mu_3 l_3}{r^4}\cos\varphi_3\cos\lambda_3$$

$$-\left[\frac{9}{2}\frac{\mu_1 l_1}{r^4}\cos\varphi_1\sin\lambda_1+\frac{9}{2}\frac{\mu_2 l_2}{r^4}\sin\varphi_2\right]\sin 2\varphi\sin\lambda$$

$$-\left[\frac{9}{2}\frac{\mu_1 l_1}{r^4}\cos\varphi_1\cos\lambda_1-\frac{9}{2}\frac{\mu_3 l_3}{r^4}\sin\varphi_3\right]\sin 2\varphi\cos\lambda$$

$$+9\frac{\mu_3 l_3}{r^4}\cos\varphi_3\cos\lambda_3\cos^2\varphi\cos^2\lambda$$

$$-9\frac{\mu_2 l_2}{r^4}\cos\varphi_2\sin\lambda_2\cos^2\varphi\sin^2\lambda$$

$$-\left(\frac{9}{2}\frac{\mu_2 l_2}{r^4}\cos\varphi_2\cos\lambda_2-\frac{9}{2}\frac{\mu_3 l_3}{r^4}\cos\varphi_3\sin\lambda_3\right)\cos^2\varphi\sin 2\lambda$$

(összehasonlításra régi jelölések

$$\mu_1=\mu\sin\varphi_\tau$$

$$\mu_2=\mu\cos\varphi_\tau\sin\lambda_\tau$$

$$\mu_3=-\mu\cos\varphi_\tau\cos\lambda_\tau$$

Terrich $\mu_1 = \mu_a \quad \mu_2 = \mu_b \quad \mu_3 = \mu_c$

$\xi_a = l_1 \sin\varphi_1 \qquad \xi_b = l_2 \sin\varphi_2 \qquad \xi_c = l_3 \sin\varphi_3$

$\eta_a = l_1 \cos\varphi_1 \sin\lambda_1 \qquad \eta_b = l_2 \cos\varphi_2 \sin\lambda_2 \qquad \eta_c = l_3 \cos\varphi_3 \sin\lambda_3$

$\zeta_a = -l_1 \cos\varphi_1 \cos\lambda_1 \qquad \zeta_b = -l_2 \cos\varphi_2 \cos\lambda_2 \qquad \zeta_c = -l_3 \cos\varphi_3 \cos\lambda_3$

$$X = -\frac{\mu_a}{r^3}\cos\varphi + \frac{\mu_b}{r^3}\sin\varphi\sin\lambda - \frac{\mu_c}{r^3}\sin\varphi\cos\lambda$$
$$-\left(3\frac{\mu_a}{r^4}\xi_a - 3\frac{\mu_b}{r^4}\eta_b\right)\sin 2\varphi - \left(3\frac{\mu_a}{r^4}\eta_a + 3\frac{\mu_b}{r^4}\xi_b\right)\cos 2\varphi \sin\lambda + \left(3\frac{\mu_a}{r^4}\xi_a + 3\frac{\mu_c}{r^4}\xi_c\right)\cos 2\varphi\cos\lambda$$
$$-\frac{1}{2}\left(3\frac{\mu_b}{r^4}\xi_b + 3\frac{\mu_c}{r^4}\eta_c\right)\sin 2\varphi\sin 2\lambda - \left(3\frac{\mu_b}{r^4}\eta_b - 3\frac{\mu_c}{r^4}\xi_c\right)\sin 2\varphi\cos^2\lambda$$

$$Y = -\frac{\mu_c}{r^3}\sin\lambda - \frac{\mu_b}{r^3}\cos\lambda - \left(3\frac{\mu_a}{r^4}\xi_a + 3\frac{\mu_c}{r^4}\xi_c\right)\sin\varphi\sin\lambda - \left(3\frac{\mu_a}{r^4}\eta_a + 3\frac{\mu_b}{r^4}\xi_b\right)\sin\varphi\cos\lambda$$
$$-\left(3\frac{\mu_b}{r^4}\eta_b - 3\frac{\mu_c}{r^4}\xi_c\right)\cos\varphi\sin 2\lambda + \left(3\frac{\mu_b}{r^4}\xi_b + 3\frac{\mu_c}{r^4}\eta_c\right)\cos\varphi\cos 2\lambda$$

$$Z = -\frac{2\mu_a}{r^3}\sin\varphi - \frac{2\mu_b}{r^3}\cos\varphi\sin\lambda + \frac{2\mu_c}{r^3}\cos\varphi\cos\lambda$$
$$-2\left(3\frac{\mu_a}{r^4}\xi_a - 3\frac{\mu_b}{r^4}\eta_b\right) - \left(3\frac{\mu_b}{r^4}\eta_b - 3\frac{\mu_c}{r^4}\xi_c\right) + 3\left(3\frac{\mu_a}{r^4}\xi_a - 3\frac{\mu_b}{r^4}\eta_b\right)\cos^2\varphi$$
$$-\frac{3}{2}\left(3\frac{\mu_a}{r^4}\eta_a + 3\frac{\mu_b}{r^4}\xi_b\right)\sin 2\varphi\sin\lambda + \frac{3}{2}\left(3\frac{\mu_a}{r^4}\xi_a + 3\frac{\mu_c}{r^4}\xi_c\right)\sin 2\varphi\cos\lambda$$
$$+\frac{3}{2}\left(3\frac{\mu_b}{r^4}\xi_b + 3\frac{\mu_c}{r^4}\eta_c\right)\cos^2\varphi\sin 2\lambda + 3\left(3\frac{\mu_b}{r^4}\eta_b - 3\frac{\mu_c}{r^4}\xi_c\right)\cos^2\varphi\cos^2\lambda$$

Setzen $\frac{\mu_a}{r^3} = a \qquad \frac{\mu_b}{r^3} = b \qquad \frac{\mu_c}{r^3} = c$

$$\left(3\frac{\mu_a}{r^4}\eta_a + 3\frac{\mu_b}{r^4}\xi_b\right) = e$$
$$\left(3\frac{\mu_b}{r^4}\xi_b + 3\frac{\mu_c}{r^4}\eta_c\right) = f$$
$$\left(3\frac{\mu_a}{r^4}\xi_a + 3\frac{\mu_c}{r^4}\xi_c\right) = g$$
$$\left(3\frac{\mu_b}{r^4}\eta_b - 3\frac{\mu_c}{r^4}\xi_c\right) = i$$
$$\left(3\frac{\mu_a}{r^4}\xi_a - 3\frac{\mu_b}{r^4}\eta_b\right) = h$$

I
$$\begin{cases} X = -a\cos\varphi + b\sin\varphi\sin\lambda - c\sin\varphi\cos\lambda - h\sin 2\varphi - e\cos 2\varphi\sin\lambda \\ \quad + g\cos 2\varphi\cos\lambda - \frac{1}{2}f\sin 2\varphi\sin 2\lambda - i\sin 2\varphi\cos^2\lambda \\ Y = -c\sin\lambda - b\cos\lambda - g\sin\varphi\sin\lambda - e\sin\varphi\cos\lambda - i\cos\varphi\sin 2\lambda \\ \quad + f\cos\varphi\cos 2\lambda \\ Z = -2a\sin\varphi - 2b\cos\varphi\sin\lambda + 2c\cos\varphi\cos\lambda - 2h - i + 3h\cos^2\varphi \\ \quad - \frac{3}{2}e\sin 2\varphi\sin\lambda + \frac{3}{2}g\sin 2\varphi\cos\lambda + \frac{3}{2}f\cos^2\varphi\sin 2\lambda + 3i\cos^2\varphi\cos^2\lambda \end{cases}$$

1908 április 2) tesznük

$$k = \frac{1}{2}(2h + i) = 3\frac{\mu_a}{r^4}\xi_a - \frac{3}{2}\frac{\mu_b}{r^4}\eta_b - \frac{3}{2}\frac{\mu_c}{r^4}\xi_c$$

és $\cos^2\lambda = \frac{1}{2}\cos 2\lambda + \frac{1}{2}$

II
$$\begin{cases} X = -a\cos\varphi + b\sin\varphi\sin\lambda - c\sin\varphi\cos\lambda - k\sin 2\varphi - e\cos 2\varphi\sin\lambda \\ \quad + g\cos 2\varphi\cos\lambda - \frac{1}{2}f\sin 2\varphi\sin 2\lambda - \frac{1}{2}i\sin 2\varphi\cos 2\lambda \\ Y = -c\sin\lambda - b\cos\lambda - g\sin\varphi\sin\lambda - e\sin\varphi\cos\lambda - i\cos\varphi\sin 2\lambda \\ \quad + f\cos\varphi\cos 2\lambda \\ Z = -2a\sin\varphi - 2b\cos\varphi\sin\lambda + 2c\cos\varphi\cos\lambda - 2k\left(1 - \frac{3}{2}\cos^2\varphi\right) \\ \quad - \frac{3}{2}e\sin 2\varphi\sin\lambda + \frac{3}{2}g\sin 2\varphi\cos\lambda + \frac{3}{2}f\cos^2\varphi\sin 2\lambda + \frac{3}{2}i\cos^2\varphi\cos 2\lambda. \end{cases}$$

$$\begin{cases} X = -(a\cos\varphi + k\sin 2\varphi) + (b\sin\varphi - e\cos 2\varphi)\sin\lambda - (c\sin\varphi - g\cos 2\varphi)\cos\lambda \\ \quad - \frac{1}{2}f\sin 2\varphi\sin 2\lambda - \frac{1}{2}i\sin 2\varphi\cos 2\lambda \\ Y = -(c + g\sin\varphi)\sin\lambda - (b + e\sin\varphi)\cos\lambda - i\cos\varphi\sin 2\lambda + f\cos\varphi\cos 2\lambda \\ Z = -\left(2a\sin\varphi + 2k\left(1 - \frac{3}{2}\cos^2\varphi\right)\right) - \left(2b\cos\varphi + \frac{3}{2}e\sin 2\varphi\right)\sin\lambda \\ \quad + \left(2c\cos\varphi + \frac{3}{2}g\sin 2\varphi\right)\cos\lambda \\ \quad + \frac{3}{2}f\cos^2\varphi\sin 2\lambda + \frac{3}{2}i\cos^2\varphi\cos 2\lambda \end{cases}$$

Ms 5102/11

+75	+0,5925	−0,0264	sin λ	−0,0298	cos λ	−0,0008	sin²λ	+0,0011	sin 4λ
+80	+0,6028	−0,0172	sin λ	−0,0205	cos λ	−0,0007	sin²λ	+0,0005	sin 4λ

+40	−0,6490	−0,0275	sin λ	+0,0382	cos λ	−0,0007	cos²λ	+0,0005	sin 4λ
−75	−0,6357	−0,0369	sin λ	+0,0569	cos λ	−0,0008	cos²λ	+0,0011	sin 4λ
−70	−0,6769	−0,0478	sin λ	+0,0737	cos λ	−0,0017	cos²λ	+0,0020	sin 4λ
−60	−0,5691	−0,0693	sin λ	+0,1017	cos λ	−0,0030	cos²λ	+0,0042	sin 4λ
−50	−0,4075	−0,1026	sin λ	+0,1257	cos λ	−0,0072	cos²λ	+0,0101	sin 4λ
−40	−0,2091	−0,1203	sin λ	+0,1052	cos λ	−0,0105	cos²λ	+0,0148	sin 4λ
0	+0,0182	−0,1213	sin λ	+0,0512	cos λ	−0,0119	cos²λ	+0,0167	sin 4λ
+40	+0,2307	−0,1077	sin λ	−0,0061	cos λ	−0,0165	cos²λ	+0,0198	sin 4λ
+50	+0,4099	−0,0832	sin λ	−0,0479	cos λ	−0,0072	cos²λ	+0,0101	sin 4λ
+60	+0,5367	−0,0521	sin λ	−0,0486	cos λ	−0,0030	cos²λ	+0,0042	sin 4λ
+70	+0,5787	−0,0352	sin λ	−0,0377	cos λ	−0,0014	cos²λ	+0,0020	sin 4λ

Ab 5402/11

φ	X
−80	$+0{,}0602 - 0{,}0660 \sin\lambda + 0{,}0802 \cos\lambda - 0{,}0005 \cos^2\lambda + 0{,}0008 \sin 2\lambda$
−78	$+0{,}0720 - 0{\cdot}0653 \sin\lambda + 0{\cdot}0785 \cos\lambda - 0{\cdot}0006 \cos^2\lambda + 0{\cdot}0010 \sin 2\lambda$
−77	$+0{,}0779$
−75	$+0{,}0896 - 0{,}0643 \sin\lambda + 0{,}0755 \cos\lambda - 0{,}0008 \cos^2\lambda + 0{,}0012 \sin 2\lambda$
−70	$+0{,}1181 - 0{,}0622 \sin\lambda + 0{,}0690 \cos\lambda - 0{,}0010 \cos^2\lambda + 0{,}0016 \sin 2\lambda$
−60	$+0{,}1715 - 0{,}0559 \sin\lambda + 0{,}0518 \cos\lambda - 0{,}0014 \cos^2\lambda + 0{,}0021 \sin 2\lambda$
−40	$+0{,}2578 - 0{,}0379 \sin\lambda + 0{,}0070 \cos\lambda - 0{,}0016 \cos^2\lambda + 0{,}0024 \sin 2\lambda$
−20	$+0{,}3087 - 0{,}0157 \sin\lambda - 0{,}0352 \cos\lambda - 0{,}0010 \cos^2\lambda + 0{,}0016 \sin 2\lambda$
0	$+0{,}3178 + 0{,}0066 \sin\lambda - 0{,}0577 \cos\lambda$
+20	$+0{,}2893 + 0{,}0259 \sin\lambda - 0{,}0532 \cos\lambda + 0{,}0010 \cos^2\lambda - 0{,}0016 \sin 2\lambda$
+40	$+0{,}2290 + 0{,}0401 \sin\lambda - 0{,}0270 \cos\lambda + 0{,}0016 \cos^2\lambda - 0{,}0024 \sin 2\lambda$
+60	$+0{,}1463 + 0{,}0493 \sin\lambda + 0{,}0060 \cos\lambda + 0{,}0014 \cos^2\lambda - 0{,}0021 \sin 2\lambda$
+70	$+0{,}0993 + 0{,}0520 \sin\lambda + 0{,}0194 \cos\lambda + 0{,}0010 \cos^2\lambda - 0{,}0016 \sin 2\lambda$
+75	$+0{,}0750 + 0{,}0529 \sin\lambda + 0{,}0245 \cos\lambda + 0{,}0008 \cos^2\lambda - 0{,}0012 \sin 2\lambda$
+77	$+0{,}0651$
+78	$+0{,}0602 + 0{\cdot}0533 \sin\lambda + 0{\cdot}0269 \cos\lambda + 0{\cdot}0006 \cos^2\lambda - 0{\cdot}0010 \sin 2\lambda$
+80	$+0{,}0502 + 0{,}0536 \sin\lambda + 0{,}0282 \cos\lambda + 0{,}0005 \cos^2\lambda - 0{,}0008 \sin 2\lambda$

± 75 1000 Z.

φ		−26 sin λ	−30 cos λ	−1, cos 2λ	+1 sin 2λ	Z_{+75}		−36 sin λ	+57 cos λ	Z_{-75}
0	+592	0	−30	−1	0	+561	−635	0	+57	−579
20		−9	−28	−1	+1	+555		−12	+54	−593
40		−18	−22	−1	+1	+552		−24	+43	−636
60		−23	−15	0	+1	+555		−32	+29	−637
80		−25	−5	0	0	+562		−35	+10	−660
100		−25	+5	0	0	+572		−35	−10	−680
120		−23	+15	0	−1	+583		−32	−29	−697
140		−18	+22	−1	−1	+594		−24	−43	−704
160		−9	+28	−1	−1	+609		−12	−54	−703
180		0	+30	−1	0	+621		0	−57	−693
200		+9	+28	−1	+1	+629		+12	−54	−677
220		+18	+22	−1	+1	+632		+24	−43	−654
240		+23	+15	0	+1	+631		+32	−29	−631
260		+25	+5	0	0	+622		+35	−10	−610
280		+25	−5	0	0	+612		+35	+10	−590
300		+23	−15	0	−1	+599		+32	+29	−575
320		+18	−22	−1	−1	+586		+24	+43	−570
340		+9	−28	−1	−1	+571		+12	+54	−571

d	Z_{-75}		$-18\sin d$	$-21\cos d$	0	0	Z_{+80}		$-25\sin d$	$+39\cos d$	Z_{-80}
	-579	+603	0	-21			+582	-649	0	+39	-610
	+593		-6	-20			+577		-8	+37	-620
	-616		-12	-16			+575		-16	+29	-636
	-637		-16	-11			+576		-22	+20	-651
	-660		-18	-4			+581		-24	+7	-666
	-680		-18	+4			+589		-24	-7	-680
	-697		-16	+11			+598		-22	-20	-691
	-704		-12	+16			+607		-16	-29	-694
	-703		-6	+20			+617		-8	-37	-694
	-693		0	+21			+624		0	-39	-688
	-677		+6	+20			+629		+8	-37	-678
	-654		+12	+16			+631		+16	-29	-662
	-631		+16	+11			+630		+22	-20	-647
	-610		+18	+4			+625		+24	-7	-632
	-590		+18	-4			+617		+24	+7	-618
	-575		+16	-11			+608		+22	+20	-607
	-570		+12	-16			+599		+16	+29	-604
	-571		+6	-20			+589		+8	+37	-604

0

1000 Z

φ		−121 sin λ	+53 cos λ	−12 cos²λ	+17 sin 2λ	Z_0
0	+ 18	0	+53	−12	0	+59
20		−40	+50	−11	+11	+28
40		−80	+40	−7	+17	−12
60		−106	+27	−3	+15	−49
80		−119	+9	0	+6	−86
100		−119	−9	−0	−6	−106
120		−106	−27	−3	−15	−133
140		−80	−40	−7	−17	−126
160		−40	−50	−11	−11	−94
180		0	−53	−12	0	−47
200		+40	−50	−11	+11	+8
220		+80	−40	−7	+17	+68
240		+106	−27	−3	+15	+109
260		+119	−9	0	+6	+134
280		+119	+9	0	−6	+140
300		+106	+27	−3	−15	+133
320		+80	+40	−7	−17	+114
340		+40	+50	−11	−11	+86

φ		± 60						$1000\,\Sigma$		
		$-52\sin\lambda$	$-49\cos\lambda$	$-3\cos^2\lambda$	$+4\sin^2\lambda$	Z_{+60}		$-69\sin\lambda$	$+101\cos\lambda$	Z_{-60}
0	+537	0	-49	-3	0	+485	-564	0	+101	-466
20		-17	-46	-3	+2	+473		-23	+95	-493
40		-34	-37	-2	+4	+468		-46	+76	-532
60		-46	-25	-1	+3	+468		-61	+51	-572
80		-51	-8	0	+1	+479		-68	+17	-614
100		-51	+8	0	-1	+493		-68	-17	-650
120		-46	+25	-1	-3	+512		-61	-51	-680
140		-34	+37	-2	-4	+534		-46	-76	-692
160		-17	+46	-3	-2	+561		-23	-95	-687
180		0	+49	-3	0	+583		0	-101	-668
200		+17	+46	-3	+2	+599		+23	-95	-637
220		+34	+37	-2	+4	+610		+46	-76	-592
240		+46	+25	-1	+3	+610		+61	-51	-552
260		+51	+8	0	+1	+597		+68	-17	-512
280		+51	-8	0	-1	+579		+68	+17	-480
300		+46	-25	-1	-3	+554		+61	+51	-456
320		+34	-37	-2	-4	+528		+46	+76	-448
340		+17	-46	-3	-2	+503		+23	+95	-451

± 70

$\cos\lambda$	Z_{-60}		$-35\sin\lambda$	$-38\cos\lambda$	$-1,\cos^2\lambda$	$+2\sin 2\lambda$	Z_{+70}	-	$-48\sin\lambda$	$+74\cos\lambda$	Z_{-70}
1	-456	+578	-0	-38	-1	0	+539	-617	0	+74	-544
5	-493		-12	-36	-1	+1	+530		-16	+70	-563
6	-532		-24	-28	-1	+2	+527		-32	+56	-592
1	-572		-31	-19	0	+2	+530		-42	+27	-620
7	-614		-34	-6	0	+1	+539		-47	+12	-651
7	-650		-34	+6	0	-1	+549		-47	-12	-677
1	-680		-31	+19	0	-2	+564		-42	-37	-698
6	-692		-24	+28	-1	-2	+579		-32	-56	-708
5	-687		-12	+36	-1	-1	+600		-16	-70	-705
1	-668		0	+38	-1	0	+615		0	-74	-692
05	-637		+12	+36	-1	+1	+626		+16	-70	-671
6	-592		+24	+28	-1	+2	+631		+32	-56	-640
1	-552		+31	+19	0	+2	+630		+42	-27	-610
7	-512		+34	+6	0	+1	+619		+47	-12	-581
7	-480		+34	-6	0	-1	+605		+47	+12	-559
1	-456		+31	-19	0	-2	+588		+42	+27	-540
6	-448		+24	-28	-1	-2	+571		+32	+56	-532
5	-451		+12	-36	-1	-1	+552		+16	+70	-533

φ						± 20			1000 Z.	
		−108 sin λ	−6 cos λ	−11 cos 2λ	+15 sin 2λ	Z_{+20}		−120 sin λ	+105 cos λ	Z_{-20}
0	+231	0	−6	−11	0	+214	−204	0	+105	−110
20		−37	−6	−10	+10	+188		−41	+99	−146
40		−70	−5	−7	+15	+164		−79	+79	−196
60		−94	−3	−3	+13	+144		−105	+53	−246
80		−106	−1	0	+5	+129		−118	+13	−304
100		−106	+1	0	−5	+121		−118	−13	−340
120		−94	+3	−3	−13	+124		−105	−53	−378
140		−70	+5	−7	−15	+144		−79	−79	−384
160		−37	+6	−10	−10	+180		−41	−99	−364
180		0	+6	−11	0	+226		0	−105	−320
200		+37	+6	−10	+10	+274		+41	−99	−262
220		+70	+5	−7	+15	+314		+79	−79	−196
240		+94	+3	−3	+13	+338		+105	−53	−142
260		+106	+1	0	+5	+343		+118	−13	−94
280		+106	−1	0	−5	+331		+118	+13	−78
300		+94	−3	−3	−13	+306		+105	+53	−62
320		+70	−5	−7	−15	+274		+79	+79	−68
340		+37	−6	−10	−10	+242		+41	+99	−84

0 Z.

± 40

l.	Z_{-20}		$-83\sin l$	$-45\cos l$	$-7\cos^2 l$	$+10\sin 2l$	Z_{+40}		$-103\sin l$	$+126\cos l$	Z_{-40}
	-110	+410	0	-45	-7	0	+358	-408	0	+126	-289
	-146		-28	-42	-6	+6	+340		-35	+118	-325
	-196		-55	-34	-4	+10	+327		-68	+94	-376
	-246		-73	-23	-2	+9	+321		-90	+63	-428
	-304		-81	-7	0	+3	+325		-101	+21	-485
	-340		-81	+7	0	-3	+333		-101	-21	-533
	-378		-73	+23	-2	-9	+349		-90	-63	-572
	-384		-55	+34	-4	-10	+374		-68	-94	-584
	-364		-28	+42	-6	-6	+412		-35	-118	-573
	-320		0	+45	-7	0	+448		0	-126	-541
	-262		+28	+42	-6	+6	+480		+35	-118	-491
	-196		+55	+34	-4	+10	+505		+68	-94	-428
	-142		+73	+23	-2	+9	+513		+90	-63	-374
	-94		+81	+7	0	+3	+501		+101	-21	-325
	-78		+81	-7	0	-3	+481		+101	+21	-289
	-62		+73	-23	-2	-9	+449		+90	+63	-266
	-68		+55	-34	-4	-10	+417		+68	+94	-260
	-84		+28	-42	-6	-6	+384		+35	+118	-267

φ	$\sin\varphi$	$\cos\varphi$	$\sin 2\varphi$	$\cos 2\varphi$	$\sin^2\varphi$	$\cos^2\varphi$	φ
0	+0	+1	0	1		1	0
20	+0,34	+0,94	+0,64	+0,77		+0,88	20
40	+0,64	+0,77	+0,98	+0,17		+0,59	40
60	+0,87	+0,50	+0,87	−0,50		+0,25	60
80	+0,98	+0,17	+0,34	−0,94		+0,03	80
100	+0,98	−0,17	−0,34	−0,94		+0,03	100
120	+0,87	−0,50	−0,87	−0,50		+0,25	120
140	+0,64	−0,77	−0,98	+0,17		+0,59	140
160	+0,34	−0,94	−0,64	+0,77		+0,88	160
180	0	−1	0	+1		1	180
200	−0,34	−0,94	+0,64	+0,77		+0,88	200
220	−0,64	−0,77	+0,98	+0,17		+0,59	220
240	−0,87	−0,50	+0,87	−0,50		+0,25	240
260	−0,98	−0,17	+0,34	−0,94		+0,03	260
280	−0,98	+0,17	−0,34	−0,94		+0,03	280
300	−0,87	+0,50	−0,87	−0,50		+0,25	300
320	−0,64	+0,77	−0,98	+0,17		+0,59	320
340	−0,34	+0,94	−0,64	+077.		+0,88	

X^r

$0529 \sin l + 0{,}0245 \cos l - 0{,}0008 \cos^2 l + 0{,}0012 \sin 2l$

$0520 \sin l + 0{,}0199 \cos l - 0{,}0010 \cos^2 l + 0{,}0016 \sin 2l$

$0493 \sin l + 0{,}0060 \cos l - 0{,}0014 \cos^2 l + 0{,}0021 \sin 2l$

$0401 \sin l - 0{,}0270 \cos l - 0{,}0016 \cos^2 l + 0{,}0024 \sin 2l$

$0259 \sin l - 0{,}0532 \cos l - 0{,}0010 \cos^2 l + 0{,}0016 \sin 2l$

$0066 \sin l - 0{,}0577 \cos l$ ——— ———

$0157 \sin l - 0{,}0352 \cos l + 0{,}0010 \cos^2 l - 0{,}0016 \sin 2l$

$0379 \sin l + 0{,}0070 \cos l + 0{,}0016 \cos^2 l - 0{,}0024 \sin 2l$

$0559 \sin l + 0{,}0518 \cos l + 0{,}0014 \cos^2 l - 0{,}0021 \sin 2l$

$0622 \sin l + 0{,}0690 \cos l + 0{,}0010 \cos^2 l - 0{,}0016 \sin 2l$

$0643 \sin l + 0{,}0755 \cos l + 0{,}0008 \cos^2 l - 0{,}0012 \sin 2l$

λ	Δx												Δy											
	$\nu=-60$	-50	-20	0	+20	+40	-60	-40	-20	0	+20	+40	-60	-40	-20	0	+20	+40	-60	-40	-20	0	+20	+40
360	-10	-46	-42	-14	+14	+30	-2	-26	-1	-25	-44	-54	-38	-22	-22	-38	-54	-44	-25	-1	+30	+14	-14	-46
340	-9	-44	-40	-12	+14	+28	-2	-24	-1	-24	-42	-52	-36	-22	-20	-36	-52	-42	-24	-1	+28	+14	-12	-44
320	+9	-36	-32	-6	+18	+29	-6	-20	-2	-22	-40	-50	-34	-21	-18	-34	-50	-40	-22	-2	+29	+18	-6	-36
300	+14	-25	-28	+21	+50	+16	+12	-16	-52	+16	+13	+3	-19	-23	-23	-19	+3	+13	+16	-52	-16	+21	-28	-25
280	0	-27	-28	+32	+66	+10	+27	-60	+55	+40	+22	+12	+11	+5	+5	+11	+12	+22	+40	+55	-60	+32	-28	-27
260	-8	-30	-23	+32	+62	+20	-38	+6	+25	+8	+18	+26	+44	+37	+37	+44	+26	+18	+8	+25	-38	+32	-23	-30
240	-6	-26	-26	+12	+29	+22	-9	-23	-15	-26	-29	-12	+45	+52	+52	+45	+12	-29	-26	-15	-9	+22	-26	-26
220	+3	-18	-21	-12	+5	+12	+16	-28	-36	-33	-32	+2	+48	+61	+61	+48	+2	-32	-33	-36	+16	+12	-21	-18
200	+15	-4	-11	-13	-21	-1	+32	0	-29	-20	-12	-18	-6	+19	+19	-6	-18	-12	-20	-29	+32	-1	-21	-4
180	+12	-3	0	-12	-31	-7	+32	0	-11	+2	+1	-3	-2	-17	-17	-2	-3	+1	+2	-11	+32	-7	-31	-3
160	0	-8	+12	-10	-25	+3	+18	+14	+2	+14	+1	-20	-13	-59	-59	-13	-20	+1	+14	+2	+18	+3	-25	-8
140	-11	-6	+23	+17	-7	+3	-9	+13	+3	+15	-8	-40	-76	-76	-76	-76	-40	-8	+15	+3	-9	+13	-7	-6
120	-22	-15	+26	+33	+20	+2	-29	+9	+3	+9	-13	-62	-59	-59	-59	-59	-62	-13	+9	+3	-29	+9	-15	-26
100	-29	-32	+6	+41	+48	+12	-41	+16	+26	-8	-13	-9	-18	-18	-18	-18	-9	-13	-8	+26	+16	-9	-32	-29
80	-41	-50	-12	+38	+75	+19	-40	+23	+48	-3	-12	+28	+23	+23	+23	+28	-3	-12	-3	+48	+23	+28	-50	-41
60	-42	-35	+35	+38	+72	+42	-26	+31	+36	+5	-2	+29	+54	+54	+54	+29	-2	-2	+5	+36	+31	+29	-35	-42
40	-42	-29	+31	+32	+50	-4	+2	+14	+25	-2	+2	-15	-9	-9	-9	-15	+2	+2	-2	+25	+14	-2	-29	-42
20	-46	-24	+14	+22	+48	+16	-13	-6	-26	-39	-32	-14	+6	+6	+6	-14	-32	-39	-26	-6	-13	+16	-24	-46
0	-32	-29	-63	+22	+48	+16	-13	-6	-26	-39	-32	-14	+6	+6	+6	-14	-32	-39	-26	-6	-13	+16	-29	-32
20	-46	-24	-61	+24	+65	+26	-7	-2	-15	-9	+2	+9	+18	+22	+22	+9	+2	-9	-15	-2	-7	+26	-24	-46
40	-42	-29	-79	+31	+72	+50	-4	+2	-2	+14	+25	+7	+26	+40	+40	+7	+25	+14	-2	+2	-4	+50	-29	-42
60	-42	-35	-72	+35	+78	+42	-26	-2	+5	+31	+26	+39	+45	+58	+58	+39	+26	+31	+5	-2	-26	+42	-35	-42
80	-41	-50	-12	+38	+75	+19	-40	-12	-3	+23	+48	+28	+23	+23	+23	+28	+48	+23	-3	-12	-40	+19	-50	-41
100	-29	-32	+6	+41	+48	+12	-41	-13	-8	+16	+26	-9	-18	-18	-18	-18	-9	+26	+16	-8	-13	+12	-32	-29
120	-22	-15	+26	+33	+20	+2	-29	-1	+2	+9	+3	-12	-60	-59	-59	-60	-12	+3	+9	+2	-29	-1	-15	-22
140	-11	-6	+23	+17	-7	+3	-9	+3	+15	+13	-8	-40	-76	-76	-76	-76	-40	-8	+13	+15	+3	-9	-6	-11
160	0	-8	+12	-10	-25	+3	+18	+2	+14	+1	-20	-13	-59	-59	-59	-59	-13	-20	+1	+14	+2	+18	-8	0
180	+12	-3	0	-12	-31	-7	+32	-11	+2	0	-12	-18	-6	+19	+19	-6	-18	-12	0	+2	-11	+32	-7	+12
200	+15	-4	-11	-13	-21	-1	+32	-29	-20	-12	-18	-6	+19	+18	+18	+19	-6	-18	-12	-20	-29	+32	-1	+15
220	+3	-18	-21	-12	+5	+12	+16	-36	-33	-28	-32	+2	+48	+61	+61	+48	+2	-32	-28	-33	-36	+16	+12	+3
240	-6	-26	-26	+12	+29	+22	-9	-15	-26	-23	-24	+12	+45	+52	+52	+45	+12	-24	-23	-26	-15	-9	+22	-6
260	-8	-30	-23	+32	+62	+20	-38	+25	+8	+6	+18	+26	+44	+37	+37	+44	+26	+18	+6	+8	+25	-38	+32	-8
280	0	-27	-28	+32	+66	+10	-60	+55	+40	+27	+22	+12	+11	+5	+5	+11	+12	+22	+27	+40	+55	-60	+32	0
300	+14	-25	-28	+21	+50	-16	-52	+16	+13	+16	+13	+3	-19	-23	-23	-19	+3	+13	+16	-16	-52	+21	-28	+14
320	+9	-36	-33	+22	+29	-20	-42	+18	-6	-21	-22	-29	-28	-31	-31	-28	-29	-22	-21	-6	+18	-20	-33	+9
340	+14	-25	-42	+14	+16	-20	-42	+2	-25	-24	-14	-29	-38	-31	-31	-38	-29	-14	-24	-25	+2	-20	-42	+14
360	-10	-46	-42	-14	+14	+30	-2	-26	-1	-25	-44	-54	-38	-22	-22	-38	-54	-44	-25	-1	+30	+14	-14	-46

-60	-40	-20	0	+20	+40	+60
+96	+31	-60	-100	-40	+17	-19
+86	+8	-100	-148	-64	+9	-9
+82	-2	-119	-125	-38	+29	+22
+81	-7	-102	-87	-7	+59	+55
+75	+6	-58	-45	+31	+85	+67
+48	+14	-25	-10	+66	+106	+67
+25	+6	-10	+42	+75	+88	+48
+27	+1	0	+43	+35	+17	+5
+48	+22	+29	+21	-20	-64	-66
+29	+40	+22	+26	-40	-97	-82
+4	+28	+15	-3	-43	-92	-58
-32	0	-31	-54	-49	-61	-29
-54	-30	-63	-84	-40	-6	+22
-49	-25	-69	-82	-3	+66	+32
-46	+5	-30	-44	+29	+105	
+76	+71	+10	0	+70	+85	+25
+107	+92	+22	+26	+73	+40	+6
+101	+65	+8	-19	+26	+27	-4

$$y = \cancel{A} + a\sin l + b\cos l + A\sin 2l + B\cos 2l + \alpha\sin 4l + \beta\cos 4l$$

$$\varphi = +20/\text{négy}$$

$\alpha \sin 260° + \beta \cos 260° = 0$

$\alpha \sin 490° + \beta \cos 490° = -0{,}0070$

$\alpha = +0{,}00450$

$\beta = +0{,}00536.$

$\alpha \sin 180° + \beta \cos 180° = 0$

$\alpha \sin 290° + \beta \cos 290° = +0{,}0070.$

$2\alpha = +0{,}0090$

$2b = +0{,}0107$

$\alpha = +0{,}00393$ $\quad 2\alpha = 0{,}0039$

$\beta = +0{,}00674$ $\quad 2\beta = 0{,}0135$

	y		$+2\beta$	$2\alpha\sin 4l + 2\beta\cos 4l$				
0	+ 180	− 246			+135	− 387	0 +107	− 353
10	+ 190	− 148		$+2\alpha\sin 40 + 2\beta\cos 40$	+26 +102	− 276	+60 +87	− 289
20	+ —	− 49		$+2\alpha\sin 80 + 2\beta\cos 80$	+38 +22	− 109	+88 +18	− 155
30		− 78		$2\alpha\sin 120 + 2\beta\cos 120$	+34 −68	− 44	−81° +79 −54	− 103 32½
40		+ 227		$2\alpha\sin 160 + 2\beta\cos 160$	+13 −127	+ 341	+30 −100	+ 297
50	—	+ 392		$2\alpha\sin 200 + 2\beta\cos 200$	−13 −127	+ 532	−70 −100	+ 522
60	—	+ 506		$2\alpha\sin 240 + 2\beta\cos 240$	−34 −68	+ 608	−79 −54	+ 639 66
70	—	+ 585		$2\alpha\sin 280 + 2\beta\cos 280$	−38 +22	+ 601	−66° −88 +18	+ 655
80	—	+ 598		$2\alpha\sin 320 + 2\beta\cos 320$	−26 +102	+ 522	−60 +81	+ 577
90	—	+ 544	135			+ 409	0 +107	+ 457
100		+ 405	+128			+ 277	+141	+ 264
110		+ 160	+60			+ 100	+106	+ 54 116°
120	—	− 7	−34			+ 27 = 120	+25	− 32
130	—	− 432	−114			− 318	−70	− 262
140	—	− 654	−140			− 514	−130	− 524
150	—	− 757	−102			− 651 −153	−133	− 620 150
160	—	− 620	−16			− 604	−70	− 550
170	—	− 397	+76			− 473	+21	− 418

-3370

2411

2,5
22,5
25

60

60 | 150 — 87 / 32 — 17,4 / 261 — 28

Az 24. lendület 60 nál + 32 angström.

Az 4l. az $2\frac{1}{2}$ perc + 8 angström.

Az 4 = az 170 nál + 66 ang.

$$y = A(1 + \lambda y)\sin\lambda.$$

$$y + \lambda y \sin\lambda = A\sin\lambda.$$

$$y = \frac{A\sin\lambda}{1 + \lambda\sin\lambda} \quad h =$$

0	−123	+ 75	−198
10	−74	+ 67	−141
20	−25	+ 28	−53
30	−39	− 21	+18
40	+114	− 51	+165
50	+196	− 66	+262
60	+253	− 62	+315
70	+293	− 9	+302
80	+299	+ 50	+249
90	+272	+ 75	+197
100	+203	+ 67	+136
110	+ 80	+ 28	+ 52
120	− 4	− 21	+ 17
130	−216	− 51	−165
140	−327	− 66	−261
150	−377	− 62	−315
160	−310	− 9	−301
170	−198	+ 50	−248

		0	+
6π		3π	−
		6π	+
3π		9π	−
6π			
1			
	0		
−63			
59		1/4	250
			3500
			500
	7.26		
	252		
	−0,0003		

φ		$+4q\sin\varphi$	$+6\cos\varphi$	$+1.\cos 2\varphi$	$-2\sin 2\varphi$	X_{+60}		$-56\sin\varphi$	$+52\cos\varphi$	X_{-60}
0	+146	0	+6	+1	0	+153	+171	0	+52	+222
20		+16	+6	+1	−1	+167		−19	+49	+201
40		+32	+4	+1	−2	+181		−38	+39	+173
60		+43	+3	0	−2	+190		−49	+26	+150
80		+48	+1	0	−1	+194		−55	+9	+126
100		+48	−1	0	+1	+194		−55	−9	+106
120		+43	−3	0	+2	+188		−49	−26	+94
140		+32	−4	+1	+2	+177		−38	−39	+91
160		+16	−5	+1	+1	+159		−19	−49	+101
180		0	−6	+1	0	+141		0	−52	+118
200		−16	−5	+1	−1	+125		+19	−49	+141
220		−32	−4	+1	−2	+109		+38	−39	+171
240		−43	−3	0	−2	+98		+49	−26	+196
260		−48	−1	0	−1	+96		+55	−9	+218
280		−48	+1	0	+1	+100		+55	+9	+234
300		−43	+3	0	+2	+108		+49	+26	+244
320		−32	+4	+1	+2	+121		+38	+39	+245
340		−16	+5	+1	+1	+137		+19	+49	+237

d	X_{-60}		+53 sin d	+25 cos d	+1 cos 2d	−1. sin 2d	X_{+75}		−64 sin d	+76 cos d	X_{-75}
	+222	+75	0	+25	+1	0	+101	+90	0	+76	+165
	+201		+18	+24	+1	−1	+117		−21	+72	+141
	+173		+35	+19	+1	−1	+130		−42	+57	+105
	+150		+47	+13	0	−1	+134		−56	+38	+73
	+126		+52	+4	0	0	+131		−60	+13	+40
	+106		+52	−4	0	0	+123		−60	−13	+14
	+94		+47	−13	0	−1	+108		−56	−38	−3
	+91		+35	−19	+1	−1	+91		−42	−57	−9
	+101		+18	−24	+1	−1	+69		−21	−72	−3
	+118		0	−25	+1	0	+51		0	−76	+13
	+141		−18	−24	+1	+1	+35		+21	−72	+41
	+171		−35	−19	+1	+1	+23		+42	−57	+73
	+196		−47	−13	0	+1	+16		+56	−38	+107
	+218		−52	−4	0	0	+19		+60	−13	+140
	+234		−52	+4	0	0	+27		+60	+13	+166
	+244		−47	+13	0	−1	+40		+56	+38	+185
	+245		−35	+19	+1	−1	+59		+42	+57	+189
	+237		−18	+24	+1	−1	+81		+21	+72	+183

φ		$+26 \sin\lambda$	$-53\cos\lambda$	$+1\cos^2\lambda$	$-2\sin 2\lambda$	X_{+20}		$-16\sin\lambda$	$-35\cos\lambda$	X_{-20}
0	+289	0	−53	+1	0	+237	+308	0	−35	+272
20	+0	+9	−50	+1	−1	+248		−5	−33	+270
40		+18	−40	+1	−2	+266		−10	−26	+273
60		+23	−27	+0	−2	+283		−14	−18	+278
80		+26	−9	0	−1	+305		−16	−6	+287
100		+26	+9	0	+1	+325		−16	+6	+297
120		+23	+27	0	+2	+341		−14	+18	+310
140		+18	+40	+1	+2	+350		−10	+26	+321
160		+9	+50	+1	+1	+350		−5	+33	+334
180		0	+53	+1	0	+343		0	+35	+342
200		−9	+50	+1	−1	+330		+5	+33	+346
220		−18	+40	+1	−2	+310		+10	+26	+345
240		−23	+27	0	−2	+291		+14	+18	+342
260		−26	+9	0	−1	+271		+16	+6	+331
280		−26	−9	0	+1	+255		+16	−6	+317
300		−23	−27	0	+2	+241		+14	−18	+302
320		−18	−40	+1	+2	+234		+10	−26	+290
340		−9	−50	+1	+1	+232		+5	−33	+278

X_{-20}		$+40\sin\lambda$	$-27\cos\lambda$	$+2\cos^2\lambda$	$-2\sin2\lambda$	X_{+40}		$-38\sin\lambda$	$+7\cos\lambda$	X_{-40}
+272	+229	0	−27	+2	0	+204	+258	0	+7	+263
+270		+13	−25	+2	−1	+218		−13	+6	+252
+273		+26	−20	+1	−2	+234		−26	+5	+236
+278		+35	−14	+1	−2	+249		−33	+4	+230
+287		+39	−4	0	−1	+263		−27	+1	+222
+297		+39	+4	0	+1	+273		−27	−1	+219
+310		+35	+14	+1	+2	+281		−22	−4	+218
+321		+26	+20	+1	+2	+278		−26	−5	+224
+334		+13	+25	+2	+1	+270		−13	−6	+236
+342		0	+27	+2	0	+258		0	−7	+249
+346		−13	+25	+2	−1	+242		+13	−6	+264
+345		−26	+20	+1	−2	+222		+26	−5	+280
+342		−35	+14	+1	−2	+207		+22	−4	+288
+331		−39	+4	0	−1	+193		+27	−1	+295
+317		−39	−4	0	+1	+187		+27	+1	+295
+302		−35	−14	+1	+2	+183		+22	+4	+292
+290		−26	−20	+1	+2	+186		+26	+5	+286
+278		−13	−25	+2	+1	+194		+13	+6	+274

φ			± 78						1000 χ	
		+53 sin 2λ	+27 cos λ	+1. cos 3λ	−1. sin 2λ	χ_{+78}		−65 sin λ	+79 cos λ	χ_{-78}
0	+60	0	+27	+1	0	+88	+72	0	+79	+150
20		+18	+25	+1	−1	+103		−22	+74	+124
40		+36	+20	+1	−1	+116		−44	+59	+87
60		+46	+14	0	−1	+119		−57	+40	+56
80		+52	+5	0	0	+117		−64	+13	+21
100		+52	−5	0	0	+107		−64	−13	−5
120		+46	−14	0	+1	+93		−57	−40	−26
140		+36	−20	+1	+1	+78		−44	−59	−33
160		+18	−25	+1	+1	+55		−22	−74	−26
180		0	−27	+1	0	+34		0	−79	−8
200		−18	−25	+1	−1	+17		+22	−74	+20
220		−36	−20	+1	−1	+4		+44	−59	+57
240		−46	−14	0	−1	−1		+57	−40	+91
260		−52	−5	0	0	+3		+64	−13	+123
280		−52	+5	0	0	+13		+64	+13	+149
300		−46	+14	0	+1	+29		+57	+40	+168
320		−36	+20	+1	+1	+46		+44	+59	+173
340		−18	+25	+1	+1	+69		+22	+74	+166

20 X

± 80

d	X_{-78}		+54 sin d	+28 cos d	+0	-1.2 sin 2d	X_{+80}		-66 sin d	+80 cos d	X_{-80}
	+150	+50	0	+28		0	+78	+60	0	+80	+140
	+124		+18	+26		-1	+93		-22	+75	+114
	+87		+36	+21		-1	+106		-44	+60	+77
	+56		+47	+14		-1	+110		-58	+40	+43
	+21		+53	+5		0	+108		-65	+13	+8
	-5		+53	-5		0	+98		-65	-13	-18
	-26		+47	-14		+1	+84		-58	-40	-39
	-33		+36	-21		+1	+66		-44	-60	-45
	-26		+18	-26		+1	+43		-22	-75	-38
	-8		0	-28		0	+22		0	-80	-20
	+20		-18	-26		-1	+5		+22	-75	+8
	+57		-36	-21		-1	-8		+44	-60	+45
	+91		-47	-14		-1	-12		+58	-40	+79
	+123		-53	-5		0	-8		+65	-13	+112
	+149		-53	+5		0	+2		+65	+13	+138
	+168		-47	+14		+1	+18		+58	+40	+157
	+173		-36	+21		+1	+36		+44	+60	+163
	+166		-18	+26		+1	+59		+22	+75	+156

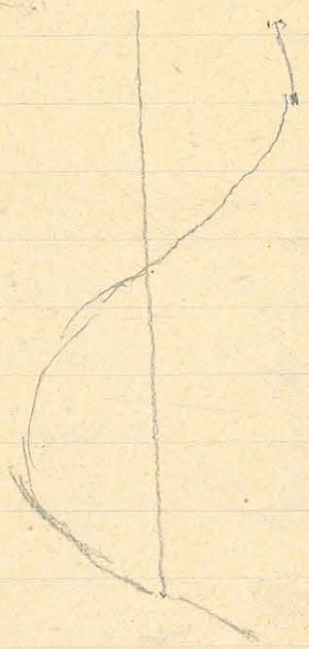
φ		+52 sin 1	+19 cos 1	+1. cos 2 1	−2 sin 2 1	X_{+70}		−62 sin 1	+69 cos 1	X_{-70}	
0	+99	0	+19	+1	0	+119	+118	0	+69	+186	+
20		+17	+18	+1	−1	+134		−21	+65	+162	
40		+34	+14	+1	−2	+146		−42	+52	+129	
60		+45	+10	0	−2	+152		−54	+35	+101	
80		+51	+3	0	−1	+152		−61	+11	+69	
100		+51	−3	0	+1	+148		−61	−11	+45	
120		+45	−10	0	+2	+136		−54	−35	+27	
140		+34	−14	+1	+2	+122		−42	−52	+21	
160		+17	−18	+1	+1	+100		−21	−65	+30	
180		0	−19	+1	0	+81		0	−69	+48	
200		−17	−18	+1	−1	+63		+21	−65	+74	
220		−34	−14	+1	−2	+50		+42	−52	+109	
240		−45	−10	0	−2	+42		+54	−35	+139	
260		−51	−3	0	−1	+44		+61	−11	+169	
280		−51	+3	0	+1	+52		+61	+11	+189	
300		−45	+10	0	+2	+66		+54	+35	+205	
320		−34	+14	+1	+2	+82		+42	+52	+209	
340		−17	+18	+1	+1	+102		+21	+65	+202	

λ	X_{-70}		$+7 \sin\lambda$	$-58 \cos\lambda$	X_0
	+186	+318	0	−58	+260
	+162		+2	−54	+266
	+129		+4	−43	+279
	+101		+6	−29	+295
	+69		+7	−10	+315
	+45		+7	+10	+335
	+27		+6	+29	+353
	+21		+4	+43	+365
	+30		+2	+54	+374
	+48		0	+58	+376
	+74		−2	+54	+370
	+109		−4	+43	+357
	+139		−6	+29	+341
	+169		−7	+10	+321
	+189		−7	−10	+301
	+205		−6	−29	+283
	+209		−4	−43	+271
	+202		−2	−54	+262

$\varphi = 0$ ra a residual component ösiga

$$\sum y = -0,0586$$

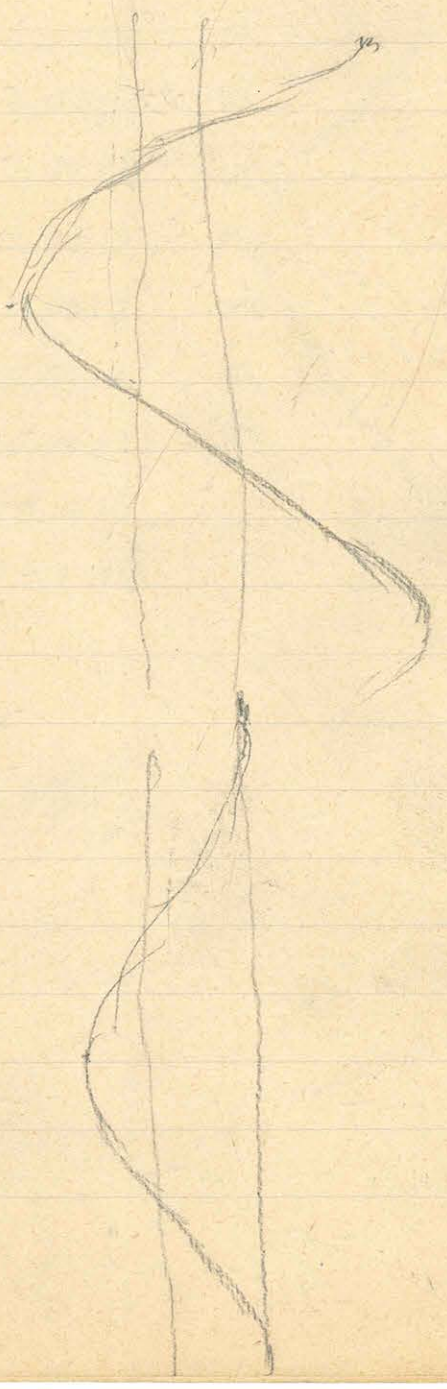
$y_0 + y_{90} + y_{180} + y_{270} = +0,0207$
$y_{10} + y_{100} + y_{190} + y_{280} = +0,0254$
$y_{20} + = +0,0128$
$y_{30} + = +0,0014$
$y_{40} + = -0,0140$
$y_{50} + = -0,0273$
$y_{60} + = -0,0380$
$y_{70} + = -0,0284$
$y_{80} + = -0,0042$



$\varphi + 40°$ ra.

$$\sum y = +0,0511$$

$y_0 + y_{90} + y_{180} + y_{270} = +0,0393$
$y_{10} + \cdots = +0,0186$
$y_{20} + \cdots = -0,0064$
$y_{30} + \cdots = -0,0224$
$y_{40} + \cdots = -0,0265$
$y_{50} + \cdots = -0,0181$
$y_{60} + \cdots = +0,0024$
$y_{70} + \cdots = +0,0238$
$y_{80} + \cdots = +0,0404$



$\varphi - 40°$ $\sum y = -0,1072$

$y_0 + \cdots = -0,0011$
$y_{10} = +0,0010$
$y_{20} = -0,0029$
$y_{30} = -0,0069$
$y_{40} = -0,0159$
$y_{50} = -0,0223$
$y_{60} = -0,0223$
$y_{70} = -0,0201$
$y_{80} = -0,0107$

y.

$\varphi = +20$ m. $\quad \Sigma y = +0{,}0044$

$y_0 + y_{30} + y_{180} + y_{210} = +0{,}0298$

$y_{40} = +0{,}0266$

$y_{20} = +0{,}0111$

$y_{30} = -0{,}0083$

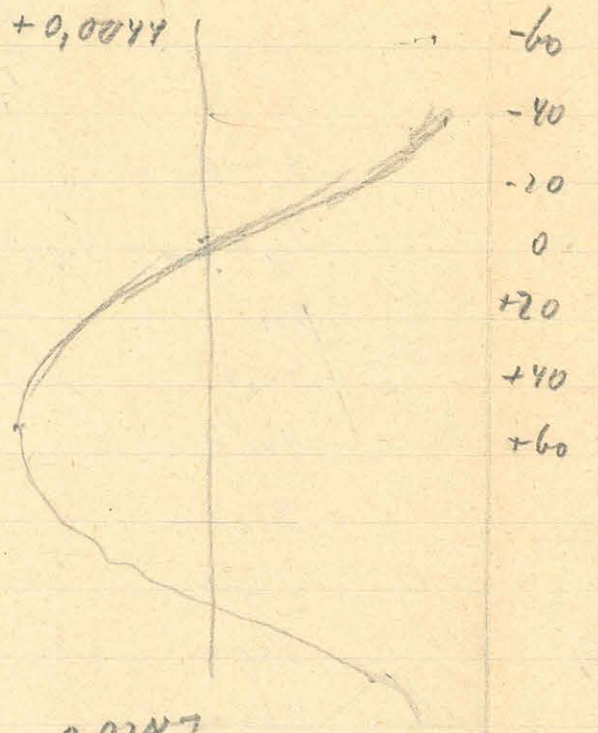
$y_{40} = -0{,}0205$

$y_{50} = -0{,}0262$

$y_{60} = -0{,}0247$

$y_{70} = -0{,}0035$

$y_{80} = +0{,}0201$



$\varphi = -20$ m. $\quad \Sigma y = -0{,}0287$

$y_0 = +0{,}0027$

$10 = +0{,}0123$

$20 = +0{,}0116$

$30 = +0{,}0048$

$40 = -0{,}0063$

$50 = -0{,}0159$

$60 = -0{,}0163$

$70 = -0{,}0121$

$80 = -0{,}0095$

+495
−1012
−287
−516
+44
+511
+118

$y = 40 + 60\,m$.

$\sum y = +0,0495$

$y_0 + y_{90} + y_{100} + y_{170} = +0,0104$

$y_{10} = +0,0172$

$y_{20} = +0,0172$

$y_{30} = +0,0116$

$y_{40} = +0,0040$

$y_{50} = -0,0052$

$y_{60} = -0,0065$

$y_{70} = -0,0027$

$y_{80} = +0,0035$

$y = +60\,m$

$\sum = +0,0118$

$y_0 + \ldots = +0,0114$

$10 = +0,0098$

$20 = -0,0100$

$30 = -0,0111$

$40 = -0,0123$

$50 = -0,0072$

$60 = +0,0021$

$70 = +0,0115$

$80 = +0,0166$

Ordinate $\sum\sum y = -0,0647$

a + második tagot is tekintsük hibának

$\varphi = -60°$ $\quad y = -0{,}0765 \sin\delta - 0{,}0663 \cos\delta \pm 0{,}0009 \sin 2\delta \pm 0{,}0024 \cos 2\delta$

-40 $\quad " = -0{,}0636 \sin\delta - 0{,}0649 \cos\delta \pm 0{,}0013 \sin 2\delta \pm 0{,}0036 \cos 2\delta$

-20 $\quad " = -0{,}0462 \sin\delta - 0{,}0629 \cos\delta \pm 0{,}0016 \sin 2\delta \pm 0{,}0044 \cos 2\delta$

0 $\quad " = -0{,}0265 \sin\delta - 0{,}0607 \cos\delta \pm 0{,}0017 \sin 2\delta \pm 0{,}0047 \cos 2\delta$

$+20$ $\quad " = -0{,}0068 \sin\delta - 0{,}0585 \cos\delta \pm 0{,}0016 \sin 2\delta \pm 0{,}0044 \cos 2\delta$

$+40$ $\quad " = +0{,}0106 \sin\delta - 0{,}0565 \cos\delta \pm 0{,}0013 \sin 2\delta \pm 0{,}0036 \cos 2\delta$

$+60$ $\quad " = +0{,}0235 \sin\delta - 0{,}0551 \cos\delta \pm 0{,}0009 \sin 2\delta \pm 0{,}0024 \cos 2\delta$

$-70°$ $\quad " = -0{,}0807 \sin\delta - 0{,}0668 \cos\delta \pm 0{,}0006 \sin 2\delta \pm 0{,}0016 \cos 2\delta$

$+70°$ $\quad " = +0{,}0277 \sin\delta - 0{,}0546 \cos\delta \pm 0{,}0006 \sin 2\delta \pm 0{,}0016 \cos 2\delta$

$\varphi = 40°$ $\quad 1000\,y =$

	$\sin\delta$	$\cos\delta$	$\sin 2\delta$	$\cos 2\delta$	$+11 \sin\delta$	$-57 \cos\delta$	$\pm 1 \sin 2\delta$	$+4 \cos 2\delta$	$\varphi = +40$	$\varphi = -40$
0	0	1	0	1	0	−57	0	+4	−61	−53
20	+0,34	+0,94	+0,64	+0,77	+4	−53	+1	+3	−53	−45
40	+0,64	+0,77	+0,98	+0,17	+7	−43	+1	+1	−38	−34
60	+0,87	+0,50	+0,87	−0,50	+10	−29	+1	−2	−17	−19
80	+0,98	+0,17	+0,34	−0,94	+11	−10	0	−4	+5	−3
100	+0,98	−0,17	−0,34	−0,94	+11	+10	0	−4	+25	+17
120	+0,87	−0,50	−0,87	−0,50	+10	+29	−1	−2	+42	+36
140	+0,64	−0,77	−0,98	+0,17	+7	+43	−1	+1	+50	+50
160	+0,34	−0,94	−0,64	+0,77	+4	+53	−1	+3	+55	+59
180	0	−1	0	+1	0	+57	0	+4	+53	+61
200	−0,34	−0,94	+0,64	+0,77	−4	+53	+1	+3	+45	+53
220	−0,64	−0,77	+0,98	+0,17	−7	+43	+1	+1	+34	+38
240	−0,87	−0,50	+0,87	−0,50	−10	+29	+1	−2	+20	+18
260	−0,98	−0,17	+0,34	−0,94	−11	+10	0	−4	+3	−5
280	−0,98	+0,17	−0,34	−0,94	−11	−10	0	−4	−17	−25
300	−0,87	+0,50	−0,87	−0,50	−10	−29	−1	−2	−36	−42
320	−0,64	+0,77	−0,98	+0,17	−7	−43	−1	+1	−50	−50
340	−0,34	+0,94	−0,64	+0,77	−4	−53	−1	+3	−59	−55

$\varphi = \pm 60$

+

$+24\sin\lambda$	$-55\cos\lambda$	$+1.\sin 2\lambda$	$+2\cos 2\lambda$	$\varphi=+60°$	$-77\sin\lambda$	$-66\cos\lambda$	$\varphi=-60°$	$\sin\lambda$	$\cos\lambda$	λ
0	−55	0	+2	−53 −57	0	−66	−64 −68	0	+1	0
+8	−52	+1	+2	−41 −47	−26	−62	−85 −91	+0,34	+0,94	20
+16	−41	+1	0	−24 −26	−51	−50	−100 −102	+0,64	+0,77	40
+21	−28	+1	−1	−7	−67	−22	−100	+0,87	+0,50	60
+24	−9	0	−2	+13 +17	−75	−11	−88 +84	+0,98	+0,17	80
+24	+9	0	−2	+31 +35	−75	+11	−66 −62	+0,98	−0,17	100
+21	+28	−1	−1	+47 +51	−67	+22	−36 −32	+0,87	−0,50	120
+16	+41	−1	0	+56 +58	−51	+50	−2 0	+0,64	−0,77	140
+8	+52	−1	+2	+61 +63	−26	+62	+37 35	+0,34	−0,94	160
0	+55	0	+2	+57 +57	0	+66	+68 64	0	−1	180
−8	+52	+1	+2	+47 +41	+26	+62	+91 85	−0,34	−0,94	200
−16	+41	+1	0	+26 +24	+51	+50	+102 100	−0,64	−0,77	220
−21	+28	+1	−1	+7	+67	+22	+100	−0,87	−0,50	240
−24	+9	0	−2	−17 −13	+75	+11	+84 88	−0,98	−0,17	260
−24	−9	0	−2	−35 −31	+75	−11	+62 68	−0,98	+0,17	280
−21	−28	−1	−1	−51 −49	+67	−22	+32 36	−0,87	+0,50	300
−16	−41	−1	0	−58 −56	+51	−50	0 2	−0,64	+0,77	320
−8	−52	−1	+2	−59 −57	+26	−62	−35 −37	−0,34	+0,94	340

$+28\sin\lambda$	$-55\cos\lambda$	$+1\sin 2\lambda$ (+ 70°)	$+2\cos 2\lambda$	$\varphi=+70$	$-81\sin\lambda$	$-67\cos\lambda$	$\varphi=-70°$	$\varphi = 70°$ ⇐	
0	−55	0	+2	−53	0	−67	−65	0	0
+9	−52	+1	+2	−40	−27	−63	−87	20	20
+18	−41	+1	0	−22	−54	−49	−102	40	
+24	−28	+1	−1	−4	−71	−34	−105	60	
+27	−9	0	−2	+16	−79	−11	−92	80	
+27	+9	0	−2	+34	−79	+11	−70	100	
+24	+28	−1	−1	+50	−71	+34	−39	120	
+18	+41	−1	0	+58	−54	+49	−6	140	
+9	+52	−1	+2	+62	−27	+63	+37	160	
								~~180~~	

$\pm \varphi = 20$

λ	$\sin 2\lambda$	$\cos 2\lambda$	$-7 \sin\lambda$	$-59 \cos\lambda$	$+2 \sin 2\lambda$	$+4 \cos 2\lambda$	$\varphi = +20$		$-46 \sin\lambda$	$-63 \cos\lambda$	$\varphi = -20$
0	0	+1	0	−59	0	+4	−55	−63	0	−63	−59 −67
20	+0,64	+0,77	−2	−55	+1	+3	−53	−61	−15	−58	−69 −77
40	+0,98	+0,17	−4	−44	+2	+1	−45	−51	−30	−46	−73 −79
60	+0,87	−0,50	−6	−30	+2	−2	−36	−36	−40	−32	−72 −72
80	+0,34	−0,94	−7	−10	+1	−4	−20	−14	−45	−10	−58 −52
100	−0,34	−0,94	−7	+10	−1	−4	−2	+8	−45	+10	−46 −30
120	−0,87	−0,50	−6	+30	−2	−2	+20	+28	−40	+32	−12 −4
140	−0,98	+0,17	−4	+44	−2	+1	+39	+41	−30	+46	+15 +17
160	−0,64	+0,77	−2	+55	−1	+3	+55	+51	−15	+58	+45 +41
180	−0	+1	0	+59	0	+4	+63	+55	0	+63	+67 +59
200	+0,64	+0,77	+2	+55	+1	+3	+61	+53	+15	+58	+77 +69
220	+0,98	+0,17	+4	+44	+2	+1	+51	+45	+30	+46	+79 +73
240	+0,87	−0,50	+6	+30	+2	−2	+36	+36	+40	+32	+72 +72
260	+0,34	−0,94	+7	+10	+1	−4	+14	+20	+45	+10	+52 +58
280	−0,34	−0,94	+7	−10	−1	−4	−8	+2	+45	−10	+20 +40
300	−0,87	−0,50	+6	−30	−2	−2	−28	−20	+40	−32	+4 +12
320	−0,98	+0,17	+4	−44	−2	+1	−41	−39	+30	−46	−17 −15
340	−0,64	+0,77	+2	−55	−1	+3	−51	−55	+15	−58	−41 −45

20°			$+28 \sin\lambda$	$-55 \cos\lambda$	$+1. \sin 2\lambda$	$+2 \cos 2\lambda$	$\varphi = +70$	$-81 \sin\lambda$	$-67 \cos\lambda$	$\varphi = -70$
0	180 →		0	+55	0	+2	+57	0	+67	+69
20	200		−9	+52	+1	+2	+46	+27	+63	+93
	220		−18	+41	+1	0	+24	+54	+49	+104
	240		−24	+28	+1	−1	+4	+71	+24	+105
	260		−27	+9	0	−2	−20	+79	+11	+88
	280		−27	−9	0	−2	−38	+79	−11	+66
	300		−24	−28	−1	−1	−54	+71	−34	+35
	320		−18	−41	−1	0	−60	+54	−49	+4
	340		−9	−52	−1	+2	−60	+27	−60	−35

a + második tagot is tekintsük helyesnek

$\varphi = -60°$ $\quad y = -0{,}0765 \sin l - 0{,}0663 \cos l \pm 0{,}0009 \sin 2l \pm 0{,}0024 \cos 2l$

-40 $\quad " = -0{,}0636 \sin l - 0{,}0649 \cos l \pm 0{,}0013 \sin 2l \pm 0{,}0036 \cos 2l$

-20 $\quad " = -0{,}0462 \sin l - 0{,}0629 \cos l \pm 0{,}0016 \sin 2l \pm 0{,}0044 \cos 2l$

0 $\quad " = -0{,}0265 \sin l - 0{,}0607 \cos l \pm 0{,}0017 \sin 2l \pm 0{,}0047 \cos 2l$

$+20$ $\quad " = -0{,}0068 \sin l - 0{,}0585 \cos l \pm 0{,}0016 \sin 2l \pm 0{,}0044 \cos 2l$

$+40$ $\quad " = +0{,}0106 \sin l - 0{,}0565 \cos l \pm 0{,}0013 \sin 2l \pm 0{,}0036 \cos 2l$

$+60$ $\quad " = +0{,}0235 \sin l - 0{,}0551 \cos l \pm 0{,}0009 \sin 2l \pm 0{,}0024 \cos 2l$

$-70°$ $\quad " = -0{,}0807 \sin l - 0{,}0668 \cos l \pm 0{,}0006 \sin 2l \pm 0{,}0016 \cos 2l$

$+70°$ $\quad " = +0{,}0277 \sin l - 0{,}0546 \cos l \pm 0{,}0006 \sin 2l \pm 0{,}0016 \cos 2l$

$\varphi = 40°$ $\quad 1000\,y =$

	$\sin l$	$\cos l$	$\sin 2l$	$\cos 2l$	$+11 \sin l$	$-57 \cos l$	$\pm 1 \sin 2l$	$+4 \cos 2l$	$\varphi = +40$	$\varphi = -40$
0	0	1	0	1	0	−57	0	+4	−61	−53
20	+0,34	+0,94	+0,64	+0,77	+4	−53	+1	+3	−53	−45
40	+0,64	+0,77	+0,98	+0,17	+7	−43	+1	+1	−38	−34
60	+0,87	+0,50	+0,87	−0,50	+10	−29	+1	−2	−17	−19
80	+0,98	+0,17	+0,34	−0,94	+11	−10	0	−4	+5	−3
100	+0,98	−0,17	−0,34	−0,94	+11	+10	0	−4	+25	+17
120	+0,87	−0,50	−0,87	−0,50	+10	+29	−1	−2	+42	+36
140	+0,64	−0,77	−0,98	+0,17	+7	+43	−1	+1	+50	+50
160	+0,34	−0,94	−0,64	+0,77	+4	+53	−1	+3	+55	+59
180	0	−1	0	+1	0	+57	0	+4	+53	+61
200	−0,34	−0,94	+0,64	+0,77	−4	+53	+1	+3	+45	+53
220	−0,64	−0,77	+0,98	+0,17	−7	+43	+1	+1	+34	+38
240	−0,87	−0,50	+0,87	−0,50	−10	+29	+1	−2	+20	+18
260	−0,98	−0,17	+0,34	−0,94	−11	+10	0	−4	+3	−5
280	−0,98	+0,17	−0,34	−0,94	−11	−10	0	−4	−17	−25
300	−0,87	+0,50	−0,87	−0,50	−10	−29	−1	−2	−36	−42
320	−0,64	+0,77	−0,98	+0,17	−7	−43	−1	+1	−50	−50
340	−0,34	+0,94	−0,64	+0,77	−4	−53	−1	+3	−59	−55

Új formula: $1000 \times y$ $\varphi = \pm 40$

l.	+18 sin l	−60 cos l	−6 sin 2l	−12 cos 2l	y_{+40}	−82 sin l	−55 cos l	y_{-40}
0	0	−60	0	−12	−72	0	−55	−67
20	+6	−56	−4	−9	−63	−27	−52	−92
40	+12	−46	−6	−2	−42	−54	−41	−103
60	+16	−30	−5	+6	−13	−72	−28	−99
80	+18	−10	−2	+11	+17	−80	−9	−80
100	+18	+10	+2	+11	+41	−80	+9	−58
120	+16	+30	+5	+6	+57	−72	+28	−43
140	+12	+46	+6	−2	+62	−54	+41	−9
160	+6	+56	+4	−9	+57	−27	+52	+20
180	0	+60	0	−12	+48	0	+55	+43
200	−6	+56	−4	−9	+37	+27	+52	+66
220	−12	+46	−6	−2	+26	+54	+41	+87
240	−16	+30	−5	+6	+15	+72	+28	+101
260	−18	+10	−2	+11	+1	+80	+9	+98
280	−18	−10	+2	+11	−15	+80	−9	+84
300	−16	−30	+5	+6	−35	+72	−28	+55
320	−12	−46	+6	−2	−54	+54	−41	+17
340	−6	−56	+4	−9	−67	+27	−52	−30

$\frac{1}{1000}\Delta 2.$

λ	$\varphi=-60$	$\varphi=-40$	$\varphi=-20$	0	+20	+40	+60
0	-30	-24	-41	-34	+22	+28	-84
20	-46	-56	-90	-89	-7	+19	-74
40	-50	-67	-113	-72	+16	+26	-43
60	-47	-69	-102	-33	+43	+60	-16
80	-43	-46	-43	+13	+81	+82	+2
100	-58	-22	+4	+66	+116	+99	-12
120	-58	-12	+30	+118	+126	+75	-39
140	-43	-2	+64	+127	+89	+1	-86
160	-30	+45	+103	+120	+29	-88	-165
180	-33	+59	+112	+114	+4	-128	-187
200	-58	+48	+93	+80	-4	-130	-169
220	-94	+17	+39	+25	-17	-94	-140
240	-121	-20	+13	-10	-7	-43	-85
260	-125	-34	-4	-8	+25	+33	-71
280	-80	-3	+19	+30	+85	+84	
300	-19	+49	+66	+76	+123	+64	-48
320	+1	+61	+71	+104	+129	+39	-71
340	-17	+21	+38	+54	+89	+35	-73

1000 Z.

± 20

φ		−112 sin λ	−15 cos λ	−19 cos² λ	+21 sen λ cos λ	Z_{+20}		−105 sin λ	+135 cos λ	Z_{-20}	
0	+186	0	−15	−19	0	+152	−245	0	+135	−129	−49
20		−38	−14	−17	+14	+131		−35	+127	−156	
40		−75	−11	−12	+21	+110		−70	+101	−204	
60		−98	−8	−5	+18	+93		−82	+68	−246	
80		−110	−3	−1	+7	+79		−103	+23	−319	
100		−110	+3	−1	−7	+71		+103	−23	−379	
120		−98	+8	−5	−18	+73		−82	−68	−418	
140		−75	+11	−11	−21	+90		−70	−101	−448	
160		−38	+14	−17	−14	+131		−25	−127	−438	
180		0	+15	−19	0	+182		0	−135	−399	
200		+38	+14	−17	+14	+235		+25	−127	−340	
220		+75	+11	−11	+21	+282		+70	−101	−266	
240		+98	+8	−5	+18	+305		+82	−68	−218	
260		+110	+3	−1	+7	+305		+103	−23	−159	
280		+110	−3	−1	−7	+285		+103	+23	−127	
300		+98	−8	−5	−18	+253		+82	+68	−118	
320		+75	−11	−11	−21	+218		+70	+101	−106	
340		+38	−14	−17	−14	+179		+25	+127	−114	

0.

	$-115\sin\delta$	$+64\cos\delta$	$-22\cos^2\delta$	$+24\sin 2\delta$	$Z=0$
-49	0	+64	-22	0	-7
	-38	+60	-20	+16	-31
	-75	+48	-13	+24	-65
	-101	+22	-6	+21	-103
	-113	+11	-1	+8	-144
	-113	-11	-1	-8	-182
	-101	-22	-6	-21	-209
	-75	-48	-13	-24	-209
	-38	-60	-20	-16	-183
	0	-64	-22	0	-135
	+38	-60	-20	+16	-75
	+75	-48	-13	+24	-11
	+101	-22	-6	+21	+35
	+113	-11	-1	+8	+60
	+113	+11	-1	-8	+66
	+101	+22	-6	-21	+57
	+75	+48	-13	-24	+37
	+38	+60	-20	-16	+13

Ujf Spánitán

$\pm 60°$

$1000 Z_1$

φ		−62 sin d	−69 cos d	−5 cos 2d	+6 sin 2d	Z_{+60}		−53 sin d	+133 cos d	Z_{-60}
0	+624	0	−69	−5	0	+550	−468	0	+133	−340
20		−21	−65	−4	+4	+538		−18	+125	−361
40		−42	−52	−3	+6	+533		−35	+100	−400
60		−54	−35	−1	+5	+539		−46	+67	−443
80		−61	−11	0	+2	+544		−52	+22	−496
100		−61	+11	0	−2	+572		−52	−22	−544
120		−54	+35	−1	−5	+599		−46	−67	−587
140		−42	+52	−3	−6	+625		−35	−100	−612
160		−21	+65	−4	−4	+660		−18	−125	−609
180		0	+69	−5	0	+688		0	−133	−606
200		+21	+65	−4	+4	+710		+18	−125	−575
220		+42	+52	−3	+6	+721		+35	−100	−530
240		+54	+35	−1	+5	+717		+46	−67	−485
260		+61	+11	0	+2	+698		+52	−22	−436
280		+61	−11	0	−2	+672		+52	+22	−396
300		+54	−35	−1	−5	+657		+46	+67	−361
320		+42	−52	−3	−6	+605		+35	+100	−342
340		+21	−65	−4	−4	+572		+18	+125	−333

...00 Z.					± 40					
l. Z_{-60}		$-9\nu\sin\lambda$	$-66\cos\lambda$	$-13\cos^2\lambda$	$+14\sin 2\lambda$	Z_{+40}		$-83\sin\lambda$	$+163\cos\lambda$	Z_{-40}
-340	+426	0	-66	-13	0	+347	-384	0	+163	-234
-361		-32	-62	-11	+9	+330		-28	+153	-261
-400		-63	-49	-8	+14	+320		-55	+122	-311
-443		-82	-33	-3	+12	+320		-73	+82	-366
-496		-92	-11	0	+5	+328		-81	+27	-433
-544		-92	+11	0	-5	+340		-81	-27	-497
-587		-82	+33	-3	-12	+362		-73	-82	-554
-612		-63	+49	-8	-14	+390		-55	-122	-583
-609		-32	+62	-11	-9	+436		-28	-153	-585
-606		0	+66	-13	0	+479		0	-163	-560
-575		+32	+62	-11	+9	+518		+28	-153	-511
-530		+63	+49	-8	+14	+538		+55	-122	-445
-485		+82	+33	-3	+12	+550		+73	-82	-384
-436		+92	+11	0	+5	+534		+81	-27	-326
-396		+92	-11	0	-5	+502		+81	+27	-281
-361		+82	-33	-3	-12	+470		+73	+82	-244
-342		+63	-49	-8	-14	+418		+55	+122	-229
-333		+32	-62	-11	-9	+376		+28	+153	-223

α	ν						$\frac{\omega\kappa}{\nu^2}$			
0	82			6724			+0,00015			
10	50			2500			0,00039			+
20	45			2025			0,00046			
30	35			1225			0,00071			
40	35			1225			0,00063			
50	32			1024			0,00063			
60	32			1024			0,00049			
70	32			1024			0,00034			
80	30			900			0,00019			
90	36			1296			0			
100	30	40	50	900	1600	2500	−0,00019	+0,00011	−0,00007	+
110	28	33	60	784	1089	3600	0,00044	0,00021	−0,00009	
120	22	27	96	484	729	9216	0,00103	0,00069	−0,00005	
130	20	26	110	400	676	12100	0,00161	0,00095	−0,00005	
140	18	22	—	324	484		0,00237	0,00168		
150	18	21	—	324	441		0,00267	0,00196		
160	17	20	—	~~289~~	400		0,00325	0,00275		
170	16	20	—	~~400~~ 256	400		0,00385	0,00276		
180	17	20	—	~~400~~ 289	400		0,00346	0,00250		
190	20	26	—	~~400~~ 400	676		0,00246	0,00146		−
200	—	—	—							
210	—									
220	—									
230	—									
240	25			625			0,00080			−
250	16			256			0,00124			
260	14			196			0,00089			
270	13			169			—			
280	13			169			+0,00103			
290	13			169			0,00203	A. meridiana		
300	13			169			0,00296			
310	14			196			0,00328	$10^7 \frac{\partial^4 u}{\partial x \partial \nu^2} = -0{,}7$		
320	14			196			0,00391			
330	16			256			0,00338			
340	86			7396			0,00012			
350	84			7056			0,00014			

		$\frac{\sin\alpha}{r^2}$		
		0		
		+0,00069		
		0,00017		
		0,00041		
		0,00053		
		0,00075		
		0,00085		
		0,00092		
		0,00109		
		0,00077		
+0,00011	-0,00007	+0,00109	-0,00061	+0,00039
0,00021	-0,00009	0,00120	0,00086	0,00026
0,00069	-0,00005	0,00179	0,00119	0,00009
0,00095	-0,00005	0,00191	0,00113	0,00006
0,00168		0,00198	0,00133	
0,00196		0,00154	0,00113	
0,00275		0,00119	0,00085	
0,00246		0,00068	0,00043	
0,00250		0	0	
0,00146		-0,00043	0,00026	
		-0,00138		
		0,00359		
		0,00503		
		0,00592		
		0,00583		
a. Meridián		0,00556	Ant. meridián	
$10^7 \frac{\partial^2 U}{\partial x \partial z} = -0,73$		0,00512	$10^9 \frac{\partial^2 U}{\partial y \partial z} = +1,74$	
		0,00391		
		0,00328		
		0,00195		
		0,00046		
		0,00025		

	$\rho = 500$	$\rho = 2000$	$\rho = 150$
$\int \rho^2$	$0,000031429$ $\log = 0,497328 - 5$	$0,000033209$ $\log 0,521253 - 5$	$0,000019201$ $\log = 0,283227 - 5$
$h=100 \int \rho^3$	$0,0047207$ $\log = 0,674925 - 3$	$0,0061677$ $\log = 0,790123 - 3$	$0,0016886.$
$\int \rho^4.$	$1,01758.$ $\log = 0,007568$	$2,35869$ $\log = 0,372673$	$0,09232$ $0,965296_{-2}$

Wówczas dla $\frac{\rho^2}{h^2}$ $\frac{h^2}{\rho^2}$ mamy

$$\int \rho^2 = \frac{1}{3h^2} - \frac{1}{2\rho^2}$$

$$\frac{1}{3h^2} = 0,000033333$$

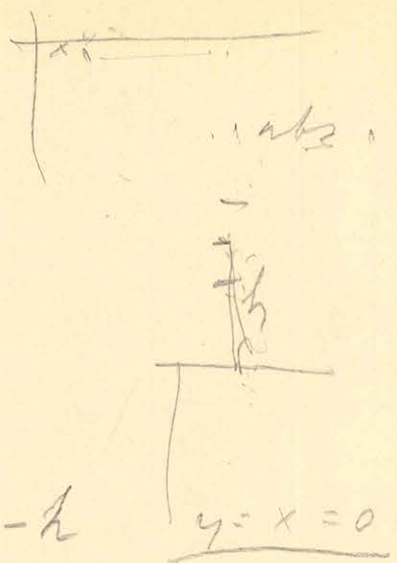
$$\int \rho^3 = \frac{2}{3}\frac{1}{h} - \frac{1}{\rho}\left(1 - \frac{5}{6}\frac{h^2}{\rho^2}\right)$$

$$\frac{2}{3}\frac{1}{h} = 0,00666667.$$

$$\int \rho^4 = \log 2\frac{\rho}{h}\left(1 + \frac{1}{4}\frac{h^2}{\rho^2}\right) + \frac{h^2}{\rho^2} - \frac{4}{3} = \log 2\frac{\rho}{h} + \frac{5}{4}\frac{h^2}{\rho^2} - \frac{4}{3}$$

$$\frac{1 + (x-a)^2}{a - x}$$

$$\frac{\partial U}{\partial x} = \int \sigma \, dm \frac{a-x}{\left((a-x)^2+(b-y)^2+(c-z)^2\right)^{\frac{3}{2}}}$$



$$\frac{\partial^2 U}{\partial x^2} = +3\int \sigma \, dm \frac{(a-x)^2}{N^5} - \int \sigma \, dm \frac{1}{N^3}$$

$$\frac{\partial U}{\partial x \partial z} = +3\int \sigma \, dm \frac{(a-x)(c-z)}{N^5}$$

$$\frac{\partial^2 U}{\partial y^2} = +3\int \sigma \, dm \frac{(b-y)^2}{N^5} - \int \sigma \, dm \frac{1}{N^3}$$

$$\frac{\partial U}{\partial x \partial y} = +3\int \sigma \, dm \frac{(a-x)(b-y)}{N^5}$$

$$\frac{\partial^2 U}{\partial y^2} - \frac{\partial^2 U}{\partial x^2} = +3\int \sigma \, dm \frac{b^2-a^2}{\left(a^2+b^2+(c+h)^2\right)^{\frac{5}{2}}}$$

$$\frac{\partial^2 U}{\partial x \partial z} = +3\int \sigma \, dm \frac{a(h+c)}{\left(a^2+b^2+(c+h)^2\right)^{\frac{5}{2}}}$$

$$dm = \rho \, d\rho \, d\alpha \, dc$$

$$b = \rho \sin\alpha \qquad a = \rho\cos\alpha$$

$$\frac{\partial^2 U}{\partial x \partial y} = +3\int \sigma \, dm \frac{ab}{(\quad)^{\frac{5}{2}}}$$

$$\int_0^{-\xi} \frac{dc}{(\quad)^{\frac{5}{2}}} = \frac{2}{3}$$

$$\frac{\partial^2 U}{\partial y^2} - \frac{\partial^2 U}{\partial x^2} = +3\int \sigma \rho^3 d\rho \cdot \frac{\cos 2\alpha \, d\alpha \, dc}{\left(a^2+b^2+(c+h)^2\right)^{\frac{5}{2}}}$$

$$\frac{\partial^2 U}{\partial x \partial y} = +3\int \sigma \rho^3 d\rho \frac{\sin 2\alpha}{2} \frac{d\alpha \, dc}{(\quad)^{\frac{5}{2}}}$$

$$\int_0^{-\xi} \frac{(h+c)\,dc}{(\quad)^{\frac{5}{2}}}$$

$$\frac{\partial^2 U}{\partial x \partial z} = +3\int \sigma \rho^2 d\rho \cos\alpha \frac{(h+c)\,d\alpha \, dc}{(N)^{\frac{5}{2}}}$$

$$\frac{\partial^2 U}{\partial y \partial z} = +3\int \sigma \rho^2 d\rho \sin\alpha \frac{h+c \; d\alpha \, dc}{(\quad)^{\frac{5}{2}}}$$

	$\frac{\cos\alpha}{\rho^3} = \frac{1}{10000}$		$\frac{\cos\alpha}{\rho^3} = \frac{1}{100000}$	
	$\rho = \sqrt[3]{10000}\sqrt[3]{\cos\alpha}$			
	$\sqrt[3]{10000} = 21{,}544$			
0°	21,544	86,2	46,416	185,7
5°	21,516	86,1	46,356	185,4
10°	21,434	85,7	46,179	184,7
15°	21,296	85,2	45,882	183,5
20°	21,102	84,4	45,464	181,8
25°	20,848	83,4	44,917	179,7
30°	20,536	82,1	44,244	177,0
35°	20,159	80,6	43,431	173,7
40°	19,713	78,8	42,471	169,9
45°	19,194	76,8	41,352	165,4
50°	18,592	74,4	40,057	160,2
55°	17,901	71,6	38,567	154,4
60°	17,099	68,4	36,840	147,3
65°	16,167	64,7	34,831	139,3
70°	15,066	60,3	32,459	129,8
75°	13,730	54,9	29,581	118,3
80°	12,019	48,1	25,896	103,6
85°	9,553	38,2	20,581	82,9
90°	0			

1–119 ételkészítő φ középszélesség = $\varphi_0 = 58° 21'$
H középmagasság = $H_0 = 1640$

			$\varphi - \varphi_0$ percben	$H - H_0$
1	55° 33·3′	1743	−167,7	+103
2	54·2	1724	−146,8	+84
3	55·6	1700	−145,4	+60
4	56° 1·8	1719	−139,2	+79
5	3·2	1715	−137,8	+75
6	9·3	1726	−131,7	+86
7	9·5	1702	−131,5	+62
8	10·5	1736	−130,5	+96
9	10·5	1712	−130,5	+72
10	11·7	1729	−129,3	+89
11	11·8	1703	−129,2	+63
12	13·0	1720	−128,0	+80
13	18·7	1718	−122,3	+78
14	19·3	1686	−121,7	+46
15	25·2	1729	−115,8	+89
16	32·2	1700	−108,8	+60
17	33·3	1689	−107,7	+49
18	37·8	1711	−103,2	+71
19	39·7	1678	−101,3	+38
20	41·7	1694	−99,3	+54
21	44·9	1698	−96,1	+58
22	45·1	1723	−95,9	+83
23	47·1	1699	−93,9	+59
24	49·7	1705	−91,3	+65
25	50·0	1722	−91,0	+82
26	52·7	1706	−88,3	+66
27	54·9	1730	−86,1	+90
28	57° 0·2	1671	−80,8	+31
29	0·2	1693	−80,8	+53
30	10·2	1670	−70,8	+30
31	19·3	1755	−61,7	+115
56 páratlan.	$S = 906,6$	53006		

				$\varphi - \varphi_0$	$\Delta l - \Delta l_0$
32	57°	21.3	1671	-59,7	+31
33		22.7	1716	-58,3	+76
34		24.3	1714	-56,7	+74
35		25.7	1666	-55,3	+26
36		30.9	1675	-50,1	+35
37		39.3	1683	-41,7	+43
38		41.1	1674	-39,9	+34
39		47.0	1680	-34,0	+40
40		47.0	1673	-34,0	+43
41		47.9	1706	-33,1	+66
42		48.5	1667	-32,5	+27
43		50.4	1670	-30,6	+30
44		51.8	1659	-29,2	+19
45		53.1	1631	-27,9	-9
46		54.6	1650	-26,4	+10
47		54.6	1651	-26,4	+11
48		55.4	1642	-25,6	+2
49		56.3	1655	-24,7	+15
50		57.0	1653	-24,0	+13
51		58.6	1659	-22,4	+19
52		59.6	1667	-21,4	+27
53	58°	1.3	1600	-19,7	-40
54		2.4	1659	-18,6	+19
55		3.0	1629	-18,0	-11
56		3.1	1662	-17,9	+22
57		12.4	1708	-8,6	+68
58		20.4	1660	-0,6	+20
59		24.0	1612	+3,0	-28
60		24.0	1603	+3,0	-37
61		25.6	1624	+4,6	-16
62		27.0	1617	+6,0	-23
56 fm		3550,3	51436		

63	58°	28.1	1657	+7,1	+17
64		30.0	1627	+9,0	−13
65		30.5	1660	+9,5	+20
66		30.8	1649	+9,8	+9
67		32.2	1623	+11,2	−17
68		32.3	1620	+11,3	−20
69		34.3	1630	+13,3	−10
70		35.0	1609	+14,0	−31
71		38.0	1608	+17,0	−32
72		42.6	1615	+21,6	−25
73		44.8	1628	+23,8	−12
74		48.6	1616	+27,6	−24
75		57.1	1623	+36,1	−27
76		59.0	1632	+38,0	−8
77	59°	0	1611	+39,0	−29
78		2.7	1606	+41,7	−34
79		3.0	1609	+42,0	−31
80		4.2	1608	+43,2	−32
81		4.2	1601	+43,2	−39
82		7.2	1558	+46,2	−82
83		7.5	1578	+46,5	−62
84		8.0	1607	+47,0	−33
85		13.0	1590	+52,0	−50
86		13.0	1522	+52,0	−118
87		14.5	1540	+53,5	−100
88		17.0	1616	+56,0	−24
89		17.2	1572	+56,2	−68
90		18.0	1585	+57,0	−55
91		19.0	1556	+58,0	−84
92		23.0	1633	+62,0	−7
93		31.1	1619	+70,1	−21
		5485,9	49808		

			$\gamma - \gamma_0$	$\lambda - \lambda_0$
94	59° 36.0	1587	+75	−53
95	36.0	1598	+75	−42
96	40.0	1600	+79	−40
97	45.0	1594	+84	−46
98	60° 4.0	1573	+103	−67
99	6.0	1610	+105	−30
100	7.0	1568	+106	−72
101	14.0	1630	+113	−10
102	17.0	1566	+116	−74
103	19.0	1621	+118	−19
104	21.0	1574	+120	−66
105	24.0	1573	+123	−67
106	24.5	1579	+123,5	−61
107	26.0	1579	+125	−61
108	27.0	1581	+126	−59
109	27.0	1587	+126	−53
110	30.0	1563	+129	−77
111	31.0	1554	+130	−86
112	33.0	1561	+132	−79
113	36.0	1567	+135	−73
114	40.0	1542	+139	−98
115	43.0	1582	+142	−58
116	61° 0	1530	+159	−110
117	0	1547	+159	−93
118	4.0	1542	+163	−98
119	9.0	1538	+168	−102
	6839,5	40946		
120	62° 29.0	1502	+248	−138
121	39.5	1478	+258,5	−162
122	50.0	1466	+269,0	−174
123	56.0	1466	+275	−174
124	63° 9.5	1480	+288,5	−160

125	63°	12·0	1476	
126		12·0	1440	
127		13·0	1475	
128	65°	42·0	1359	
129				
130				
131				
132				
133				
134				
135				

α	$\log\sqrt[3]{\cos\alpha}$	$\sqrt[3]{\cos\alpha}$
0	0,000000	1,00000
5	0,999448-1	0,99873
10	0,997784-1	0,99491
15	0,994981-1	0,98851
20	0,990995-1	0,97948
25	0,985759-1	0,96774
30	0,979177-1	0,95318
35	0,971122-1	0,93567
40	0,961418-1	0,91499
45	0,949828-1	0,89090
50	0,936022-1	0,86302
55	0,919530-1	0,83086
60	0,899657-1	0,79370
65	0,875316-1	0,75044
70	0,844684-1	0,69933
75	0,804332-1	0,63728
80	0,746957-1	0,55790
85	0,646765-1	0,44337
90	- - -	0,00000

	Allonia	φ - 54°		λ - λ₀	λ cos φ	F	Ø	X	Y
64	Crieff	142,5		— 9.6	- 5,3	107	+ 92	- 4	+ 107
65	Crieff Junction	136.4		- 16.0	- 8,9	188	- 147	- 158	- 102
66	Crinan	125.4		+ 93.5	+ 52,2	85	+ 89	+ 1	+ 85
67	Cuil Bay	218.6		+ 77.7	+ 42,7	81	- 17	+ 78	- 24
68	Cumbrae	107.8		+ 53.7	+ 30,2	233	+ 175	- 232	+ 20
69	Cupar	139.2		- 58.5	- 32,4	45	+ 111	- 16	+ 42
70	Dalmally	144.1		+ 58.1	+ 32,2	206	+ 43	+ 140	+ 150
71	Dalwhinnie	175.9		+ 14.2	+ 7,8	110	+ 39	+ 69	+ 86
72	Dingwall	215.7		+ 24.7	+ 13,2	243	- 127	- 146	- 194
73	Dingwoodie	71.6		- 35.7	- 20,4	64	+ 59	+ 33	+ 55
74	Dolphinton	102.9		- 35.5	- 20,0	91	+ 27	+ 41	+ 81
75	Island Donnan	196.5		+ 97.1	+ 49,3	157	+ 158	- 146	+ 59
76	L. Doon	77.4		+ 20.8	+ 11,9	74	+ 56	+ 41	+ 61
77	Dufftown	206.6		- 52.0	- 28.0	139	+ 43	+ 101	+ 95
78	L. Duich	193.4		+ 85.1	+ 46.1	153	+ 98	- 21	+ 151
79	Dumfries	62.2		- 24.5	- 14.0	24	+ 73	+ 7	+ 23
80	Dunbar	118.6		- 88.5	- 49.5	24	+ 83	+ 3	+ 24
81	Dunblane	131.1		- 2.3	- 1,3	137	- 144	- 110	- 81
82	Dundee	148.3		- 63.0	- 34,8	45	- 174	- 45	- 5
83	Dunkeld	153.7		- 25.1	- 13,8	250	- 102	- 52	- 245
84	Earlston	98.4		- 79.5	- 44,9	11	0	+ 11	0
85	Edinburgh	117.9		- 47.5	- 26,6	33	+ 171	- 33	+ 5
86	Elgin	218.7		- 41.0	- 21,9	85	- 81	+ 13	- 84
87	Elkon	201.8		- 115.9	- 62,5	42	- 170	- 41	- 7
88	Elvanfoot	84.6		- 25.3	- 14,4	69	+ 170	- 68	+ 12
89	L. Eriboll	269.3		+ 39.3	+ 20,5	38	- 55	+ 22	- 31
90	Ewe Island	230.5		+ 98.0	+ 52,2	298	- 83	+ 36	- 296
91	Fairlie	105.5		+ 51.1	+ 28,8	—	—	—	—
92	Falkirk	119.6		- 12.3	- 6,9	418	- 170	- 412	- 73
93	Forres	215.5		- 20.8	- 11,2	34	+ 33	+ 29	+ 18
94	Forsinard	261.8		- 6.4	- 3,4	137	+ 63	+ 62	+ 122
95	Fort Augustus	188.5		+ 40.5	+ 22,0	84	- 110	- 28	- 79
		S = + 4980.0			S = - 11,1			S = - 825	S = - 25

Z	φ X	φ Y	φ Z	X λ cos φ	Y λ cos φ	Z λ cos φ
+ 202	− 570	+15248	+28785	+ 21	− 567	− 1071
− 64	−21551	−13913	− 8730	+ 1406	+ 908	+ 570
−159	+ 125	+10659	−19939	+ 52	+4437	−8300
+ 28	+17051	− 5246	+ 6121	+ 3331	− 1025	+ 1196
+ 208	−25010	+2756	+22422	− 7006	+ 604	+ 6282
+ 134	− 2227	+ 5846	+18653	+ 518	− 1360	− 4342
−175	+20174	+21615	−25218	+ 4508	+4830	− 5635
− 258	+12137	+15127	−45382	+ 538	+ 671	− 2012
− 13	−31492	−41846	− 2804	− 1927	− 2561	− 172
− 106	+ 2363	+ 3928	− 7590	− 673	− 1121	+ 2162
− 6	+ 4219	+ 8335	− 617	− 820	− 1620	+ 120
− 12	−28689	+11594	− 2358	− 7198	+ 2909	− 592
−138	+ 3173	+ 4721	−10681	+ 488	+ 726	− 1642
+ 314	+20867	+19627	+64872	− 2828	− 2660	− 8792
+ 158	− 4061	+29203	+30557	− 968	+ 6961	+ 7284
− 107	+ 435	+ 1431	− 6655	− 98	− 322	+ 1498
− 100	+ 356	+ 2846	−11860	− 149	− 1188	+ 4950
− 151	−14421	−10619	−19796	+ 143	+ 105	+ 196
− 23	− 6673	− 742	− 3411	+ 1566	+ 174	+ 800
+ 79	− 7992	−37657	+12142	+ 718	+ 3381	− 1090
− 13	+ 1082	0	− 1279	− 494	0	+ 584
+ 74	− 3891	+ 590	+ 8725	+ 878	− 133	− 1968
+ 4	+ 2843	−18371	+ 875	− 285	+ 1840	− 88
− 17	− 8274	− 1413	− 3431	+ 2562	+ 438	+ 1063
+ 59	− 5753	+ 1015	+ 4991	+ 979	− 173	− 850
+ 159	+ 5925	− 8348	+ 42819	+ 451	− 636	+ 3260
− 314	+ 8298	−68228	−72377	+ 1879	−15451	−16391
+ 127	—	—	+13399	—	—	+ 3658
+ 56	−49275	− 8731	+ 6698	+ 2843	+ 504	− 386
− 20	+ 6250	+ 3879	− 4310	− 325	− 202	+ 224
+ 34	+16231	+31940	+ 8901	− 211	− 415	− 116
+ 53	− 5278	−14891	+ 9991	− 616	− 1738	+ 1166
S = +13	S = −93628	S = −21335	S = +33513	S = − 718	S = − 2685	S = −18434

	Allonis	φ_{-54°	λ_{-4°	$\lambda \cos\varphi$	F	Ø	X	Y
32	Bervie	+170,6	−103,4	− 56,5	80	−155	− 73 −	− 34 −
33	Berwick	+106,1	−120,1	− 67,6	162	− 17	+156	− 47 −
34	Bethyhill	+271,6	+ 13,3	+ 6,9	66	− 44	+ 48	− 46 −
35	Blair Athol	+166,1	− 9,3	− 5,1	28	− 15	+ 27	− 7 −
36	Boat of Garden	+195,0	− 14,8	− 8,0	205	+ 91	− 3 −	+ 205
37	L. Broidale	+188,9	+ 198,0	+ 107,4	301	− 113	− 117 −	− 277 −
38	Braemar	+180,7	− 36,4	− 19,8	117	+ 8	+ 116	+ 16
39	Braemore	+226,1	+ 62,2	+ 33,2	85	− 17	+ 82	− 25 −
40	Bridgend	+106,8	+ 135,2	+ 76,1	410	+ 86	+ 29	+ 409
41	Broadford	+194,6	+ 114,6	+ 62,0	457	+ 131	− 300 −	+ 345
42	Brodick	+ 95,1	+ 69,5	+ 39,3	219	+ 78	+ 46	+ 214
43	Broughton	+ 96,7	− 35,5	− 20,0	25	+ 34	+ 21	+ 14
44	Buchie	+219,8	− 63,3	− 33,8	223	+ 86	+ 16	+ 222
45	Bunnahabhain	+113,0	+ 128,0	+ 71,8	260	+ 71	+ 85	+ 246
46	Cabrach	+200,8	− 58,1	− 31,3	142	− 175	− 141 −	− 12 −
47	Cairn-o Mount	+175,8	− 85,8	− 46,7	60	+ 88	+ 2	+ 60
48	Callander	+134,4	+ 13,1	+ 7,3	240	+ 18	+ 228	+ 74
49	Callernish	+251,0	+ 162,0	+ 85,4	64	+ 20	+ 60	+ 22
50	Camas-han Gall	+169,7	+ 67,4	+ 37,0	33	+ 43	+ 24	+ 22
51	Campbeltown	+ 85,5	+ 96,1	+ 54,5	40	+ 146	− 33 −	+ 22
52	Canna	+183,5	+ 149,3	+ 81,2	741	− 112	− 393 −	− 630 −
53	Carskey	+ 78,7	+ 101,8	+ 57,9	—	—	—	—
54	Carsphairn	+ 73,1	+ 16,0	+ 9,1	12	− 156	− 11 −	− 5 −
55	Carstairs	+101,2	− 19,8	− 11,2	159	+ 14	+ 154	+ 38
56	Castle Bay	+177,2	+ 209,6	+ 114,3	510	− 121	− 263 −	− 437 −
57	Castle Douglas	+ 56,6	− 3,1	− 1,7	17	+ 40	+ 13	+ 11
58	Le Cheau Chanit	+245,1	+ 181,7	+ 96,1	149	− 30	+ 129	− 75 −
59	Clonaig	+105,1	+ 83,6	+ 47,1	185	+ 166	− 179 −	+ 45
60	Cockbridge	+190,2	− 46,3	− 25,1	48	+ 13	+ 47	+ 11
61	L. Carrie	+157,1	+ 91,1	+ 50,2	17	− 77	+ 4	− 16 −
62	Craigendowie	+168,6	− 73,2	− 40,1	100	+ 22	+ 93	+ 37
63	Crianlarich	+143,4	+ 37,1	+ 20,5	37	+ 107	− 11 −	+ 35
		S=+5028·1		S=+690,4			S=−144	S=+437

Z	φX	φY	φZ	X1cosφ	Y1cosφ	Z1cosφ
-64	-12454	-5800	-10918	+4125	+1921	+3616
+180	+16552	-4987	+19098	-10546	+3177	-12168
-75	+13037	-12494	-20370	+331	-317	-518
-201	+4485	-1163	-33386	-138	+36	+1025
+32	-585	+39975	+6240	+24	-1640	-256
-688	-22101	-52325	-129963	-12566	-29750	-73891
-330	+20961	+2891	-59631	-2297	-317	+6534
+29	+18540	-5653	+6557	+2722	-830	+963
+390	+3097	+43681	+41652	+2207	+31125	+29679
+414	-58380	+67107	+80564	-18600	+21390	+25668
+223	+4375	+20351	+21207	+1808	+8410	+8764
-3	+2031	+1354	-290	-420	-280	+60
+34	+3517	+48796	+7473	-541	-7504	-1149
+149	+9605	+27798	+16807	+6103	+17663	+10698
-17	-28312	-2410	-3414	+4413	+376	+532
-2	+352	+10548	-352	-93	-2802	+93
+138	+30643	+9946	+18547	+1664	+540	+1007
+86	+15060	+5522	+21586	+5124	+1879	+7344
+172	+4073	+3733	+29188	+888	+874	+6364
+4	-2829	+1881	+342	-1799	+1199	+218
+1871	-72116	-115605	+343329	-31912	-51156	+151925
+4	—	—	+315	—	—	+18239
-115	-804	-366	-8407	-100	-46	-1047
-103	+15584	+3846	-10424	-1724	-426	+1154
-209	-55125	-91595	-43806	-30061	-49949	-23889
-52	+736	+623	-2943	-22	-19	+88
-59	+31618	-18383	-14461	+12397	-7208	-5670
-549	-18813	+4730	-57700	-8431	+2119	-25858
-146	+8929	+2092	-27769	-1180	-276	+3665
+121	+628	-2513	+19009	+201	-803	+6074
-141	+15680	+6238	-23773	-3729	-1484	+5654
-225	-1577	+5019	-32265	-226	+718	-4613
S=+868	S=-53583	S=-7133	S=+152072	S=-82378	S=-63440	S=+140305

	Allonia	φ	λ	cos φ λ	F	Ø	X	Y
1	Aberdeen (1)	189·8	− 113·9	− 61,8	103	− 150	− 89 —	− 52
2	– Ellon (2)	199·3	− 117·6	− 63,5	199	− 135	− 141 —	− 141
3	– – – (3)	195·4	− 116·6	− 63,1	357	− 136	− 257 —	− 248
4	——— (4)	192·4	− 115·2	− 62,5	166	− 20	+ 156	− 57
5	— Stonehaven (5)	185·2	− 112·8	− 61,3	140	− 145	− 115 —	− 80
6	- – - (6)	183·5	− 111·0	− 60,4	92	+ 70	+ 31	+ 86
7	- – – (7)	180·8	− 109·7	− 59,7	96	− 159	− 90 —	− 34
8	Abington	89·7	− 18·5	− 10,5	52	+ 6	+ 52	+ 5
9	Aboyne	184·4	− 74·1	− 40,3	388	+ 164	− 373 —	+ 107
10	Achanalds	216·5	+ 54·7	+ 29,3	58	− 90	0	− 58
11	Achnashellach	+ 208·9	+ 79·3	+ 42,6	73	− 150	− 63 —	− 37
12	Alford	+ 194·4	− 78·7	− 42,6	17	+ 123	− 9 —	+ 14
13	Altnabreac	+ 263·3	− 17·6	− 9,2	63	+ 176	− 63 —	+ 4
14	Altnaharra	+ 256·8	+ 26·6	+ 14,0	115	− 17	+ 110	− 33
15	Alyth	+ 157·1	− 45·9	− 25,3	150	+ 34	+ 124	+ 84
16	Arbroath	+ 153·5	− 83·3	− 45,9	159	− 34	+ 132	− 89
17	Ardgay	+ 232·7	+ 22·0	+ 11,7	170	− 63	+ 77	− 153
18	Ardrossan	+ 99·3	+ 48·1	+ 27,1	36	− 25	+ 33	− 15
19	Arinagower	(+ 157·1)	(+ 151·2)	(+ 83,2)	—	—	—	—
20	Auchnasheen (a)	+ 214·7	+ 63·8	+ 34,2	81	− 56	+ 45	− 67
21	Auldgirth	+ 69,6	− 17,4	− 9,9	8	+ 30	+ 7	+ 4
22	Aviemore	+ 171,1	+ 107,0	+ 58,5	246	+ 130	− 158 —	+ 188
23	Ayr	+ 87,5	+ 37,2	+ 21,1	54	− 29	+ 47	− 26
24	Ballater	+ 182,9	− 57,9	− 31,5	167	− 115	− 71 —	− 151
25	Ballindalloch	+ 204,6	− 36·9	− 19,9	112	− 45	+ 79	− 79
26	Balmeanach	+ 200,2	+ 126·3	+ 68,2	607	− 119	− 294 —	− 531
27	Banavie	+ 171,0	+ 65·7	+ 35,9	163	+ 18	+ 155	+ 50
28	Banff	+ 219,9	− 88·7	− 47,5	100	+ 83	+ 12	+ 99
29	L. Bay	+ 209,7	+ 153·9	+ 82,7	333	+ 94	− 23 —	+ 332
30	Bearreraig	+ 209,9	+ 128·9	+ 69,3	103	− 175	− 103 —	− 7
31	Bernera	+ 167,2	+ 217·5	+ 119,1	443	± 180	− 443 —	0
		S = + 5491,3		S = − 101,2			S = − 1232	S = − 885
		$\frac{S}{30}$ = + 183,0						

Z	φX	φY	φZ	cosφλX	cosφλY	cosφλZ
−77	−16892	−9870	−14615	+5500	+3214	+4759
−121	−28107	−28101	−24115	+8954	+8954	+7684
+67	−50218	−48459	+13092	+16217	+15649	−4228
−159	+30014	−10967	−30592	−9750	+3563	+9938
−7	−21298	−14816	−1296	+7050	+4904	+429
+259	+5689	+15787	+47527	−1872	−5194	−15644
−127	−16272	−6147	−22962	+5373	+2030	+7582
−105	+4664	+449	−9419	−546	−53	+1025
−59	−68787	+19731	+10880	+15032	−4312	+2378
−180	0	−12557	−38970	0	+1699	+5274
−247	−13161	−7729	−51598	−2684	−1576	−10522
+37	−1750	+2722	+7193	+383	−596	−1576
−169	−16588	+1053	−44498	+580	−37	+1555
−296	+28248	−8474	−76013	+1540	−462	−4144
−22	+19480	+13196	−3456	−3137	−2125	+557
+137	+20262	−13662	+21030	−6059	+4085	−6288
−330	+17918	−35603	−76791	+901	−1790	−3861
+107	+3277	−1490	+10625	+894	−407	+2900
—	—	—	—	—	—	—
−67	+9662	−14384	−14384	+1539	−2291	−2291
−36	+487	+278	−2506	−69	−40	+356
−51	−27034	+32167	−8726	−9243	+10998	−2984
−150	+4113	−2275	−13125	+992	−549	−3165
−68	−12986	−27618	−12497	+2237	+4757	+2142
+15	+16163	−16163	+3069	−1572	+1572	−299
+1008	−58859	−106306	+201802	−20051	−36214	+68746
+269	+26505	+8550	+45999	+5565	+1795	+9657
−188	+2639	+21770	−41341	−570	−4702	+8930
+955	−4823	+69620	+200263	−1902	+27456	+78979
−88	−21620	−1469	−18471	−7138	−485	−6098
+376	−74070	0	+62867	−52761	0	+44782
S=+683	S=−243332	S=−180773	S=+97272	S=−44597	S=+26445	S=+186025

Állomás.	$\varphi_{(-54')}$	$\lambda_{(-40)}$	$\lambda \cos\varphi$	F	Φ	X	Y
245	−130·8	− 59·4	− 36,7	27	0	+27	0
246	− 81·3	− 1·3	− 0,8	100	− 5	+100	−9
247	− 96·2	+ 5·2	+ 3,2	73	− 77	+16	−71
248	−140·0	−163·2	−101,2	64	−125	−37	−52
249	−107·4	− 128·1	− 78,5	112	−103	−25	−109
250	−110·4	− 336·3	−206,2	22	+ 90	0	+22
251	−256·8	− 109·0	− 70,5	117	− 94	− 8	−117
252	− 54·0	− 156·6	− 94,1	38	−105	− 16	− 36
253	+ 85·3	− 136·1	− 77,2	19	+ 51	+ 12	+ 15
254	−175·2	− 170·1	−106,8	41	− 67	+ 16	− 38
255a	+ 48·7	− 93·5	− 53,9	36	0	+36	0
255b	+ 48·6	− 93·5	− 53,9	66	+ 15	+ 64	+ 17
256	+ 25·3	− 62·4	− 36,3	60	−179	− 60	− 1
257	− 35·2	+ 21·1	+ 12,6	64	−137	− 47	− 44
258	+ 34·2	− 90·9	− 52,7	76	+167	− 74	+17
259	−178·1	−287·2	−180,6	29	− 12	+ 28	− 6
260	+ 48·2	− 73·6	− 42,4	91	+ 14	+ 89	+22
261	− 59·0	−135·9	− 81,7	85	− 45	+ 60	− 60
262	− 85·1	−147·4	− 89,6	205	+124	−115	+170
263	−163·2	− 71·1	− 44,5	33	+ 47	+ 22	+ 24
264	+ 17·4	−121·0	− 70,6	102	−174	−101	− 11
265	− 47·2	− 139·9	− 83,8	166	− 35	+ 95	−136
266	− 67·8	− 20·6	− 12,4	117	+ 80	+ 20	+115
267	− 75·0	− 1·5	− 0,9	414	− 27	+369	−186
268	− 76·4	+ 2·2	+ 1,3	257	+ 9	+254	+ 40
269	+ 32·5	− 124·5	− 72,2	101	− 150	− 87	− 51
270	− 28·1	−146·3	− 86,9	18	+ 93	− 10	+ 48
271	+ 7·4	− 47·0	− 27,6	33	− 94	− 2	− 33
272	+ 4·4	−185·2	−108,7	91	+135	− 64	+ 64
273	− 9·6	−208·4	−123,5	90	+113	− 35	+ 83
274	−166·0	−176·1	−110,3	114	− 9	+112	− 18
275	− 45·2	+ 5·2	+ 3,1	122	+158	−113	+145
	$S = -1836,0$		$S = -2084,3$			$S = +526$	$S = -326$
	$\frac{S}{32} = -57,4$		$\frac{S}{32} = -65,1$				

Z	φ X	φ Y	φ Z	X λ cos φ	Y λ cos φ	Z λ cos φ
− 56	− 3532	− 0	+ 7325	− 991	0	+ 2055
− 186	− 8130	+ 732	+ 15122	− 80	+ 7	+ 149
− 81	− 1539	+ 6820	+ 7792	+ 51	− 227	− 259
+ 180	+ 5780	+ 7280	− 25200	+ 3744	+ 5264	− 18216
− 171	+ 2685	+ 11707	+ 18365	+ 1963	+ 8557	+ 13424
− 3	0	− 2429	+ 331	0	− 4536	+ 619
− 43	+ 2054	+ 30046	+ 11042	+ 564	+ 8249	+ 3032
+ 115	+ 864	+ 1944	− 6210	+ 1506	+ 3387	− 10822
− 99	+ 1023	+ 1280	− 8445	+ 926	+ 1158	− 7643
− 62	− 2803	+ 6658	+ 10862	− 1709	+ 4058	+ 6622
− 284	+ 1753	0	− 13831	− 1940	0	+ 15308
− 130	+ 3110	+ 826	+ 6218	− 3450	− 916	+ 7007
− 19	− 1518	− 25	− 481	+ 2178	+ 36	+ 689
+ 203	+ 1654	+ 1549	− 7146	− 592	− 554	+ 2558
− 90	− 2531	+ 581	− 3090	+ 3900	− 896	+ 4743
− 10	− 4987	+ 1069	+ 1781	− 5057	+ 1084	+ 1806
− 8	+ 4290	+ 1060	− 386	− 3774	− 933	+ 339
− 96	− 3540	+ 3540	+ 5664	− 4902	+ 4902	+ 7843
+ 42	+ 9787	− 14467	− 3574	+ 10304	− 15232	− 3763
+ 31	− 3590	− 3917	− 5059	− 979	− 1068	− 1380
− 36	− 1757	− 191	− 626	+ 7131	+ 777	+ 2542
+ 116	− 4484	+ 6419	− 5475	− 7961	+ 11397	− 9721
− 48	− 1356	− 7797	+ 3254	− 248	− 1426	+ 595
+ 95	− 27675	+ 13950	− 7125	− 41	+ 21	− 9
+ 205	− 19405	− 3056	− 15662	+ 330	+ 52	+ 267
− 92	− 2828	− 1658	− 2990	+ 6281	+ 3682	+ 6642
+ 56	+ 281	− 506	− 1574	+ 869	− 1564	− 4866
− 92	− 15	− 244	− 681	+ 55	+ 911	+ 2539
+ 2	− 281	+ 281	+ 9	+ 6957	− 6957	− 217
+ 165	+ 336	− 797	− 1584	+ 4323	− 10251	− 20378
+ 54	− 18592	+ 2988	− 8964	− 12354	+ 1985	− 5956
+ 158	+ 5707	− 2034	− 7142	− 350	+ 140	+ 490
S = − 184	S = − 68682	+ 61619	S − 37380	S = + 6654	S = + 11107	S = − 3961

Nr	Name	φ − 54°	λ − 40	λ cos φ	F	Φ	X	Y
308	Brightlingsea	−131,6	−301,7	−186,5	26	+159	− 24	+ 9
309	Bramsgrove	−100,4	−116,9	− 71,4	129	− 61	+ 62	− 112
310	Bromyard	−107,9	−91,2	− 55,9	35	−168	− 34	− 7
311a	Bude Haven (a)	−190,4	+32,6	+ 20,6	52	+157	− 48	+ 20
311b	" " (b)	−190,3	+32,9	+ 20,7				
312	Builwas	−81,8	−89,0	− 54,0	30	+ 88	+ 1	+ 30
313	Builth	−110,4	−35,3	− 21,6	69	+168	− 67	+ 14
314	Burnley	−14,0	−104,5	− 61,8	88	−111	− 32	+ 82
315	Burrough o.t. Hill	−68,6	−187,5	−113,7	122	+ 61	+ 59	+106
316	Burton on Trent	−61,1	−141,1	− 85,3	18	− 34	+ 15	− 10
317	Bury	−106,4	−282,7	− 173,1	16	+ 55	+ 9	+ 13
318	Butterwick	− 27,6	−195,9	− 116,4	53	− 16	+ 51	− 14
319	Buxton	− 44,6	−123,7	− 74,0	61	− 21	+ 57	− 22
320	Carmarthen	−128,4	+18,2	+ 11,2	119	−169	− 117	− 23
321	Caerphilly	−146,0	− 44,9	− 27,9	15	−152	− 13	− 7
322	Cambridge	−108,5	−247,3	− 151,6	71	+162	− 67	+ 22
323a	Cardiff (a)	−150,4	− 49,5	− 30,8	29	− 71	+ 25	− 15
323b	" (b)	−150,4	− 49,5	− 30,8	36	− 32	+ 31	− 19
324	Cardigan	−114,7	+ 40,2	+ 24,7	58	−179	− 58	− 1
325	Carlisle	+ 53,9	− 94,3	− 54,2	41	+ 90	0	+ 41
326	Carnarvon	− 52,5	+ 16,1	+ 9,7	80	−124	− 45	− 66
327	Carno	− 86,3	− 27,7	− 16,8	78	−169	− 77	− 15
328	Castle Cary	−174,7	− 89,9	− 56,5	36	− 13	+ 35	− 8
329	Castleton	− 39,4	−133,5	− 79,7	47	− 45	+ 33	− 33
330	Chelmsford	−139,5	−267,9	−166,1	79	+138	− 58	+ 53
331a	Chepstow (a)		− 78,9	—	—	—	—	—
331b	" (b)	−142,0	− 78,9	− 49,0	7	+ 74	+ 2	+ 7
332	Chester	− 48,9	− 66,2	− 39,7	30	− 6	+ 30	− 3
333	Chesterfield	− 46,0	−135,4	− 87,0	58	+ 86	+ 4	+ 38
334	Chichester	−190,0	−193,6	− 121,9	29	+ 55	+ 17	+ 24
335	Chilcompton	−164,2	− 90,4	− 56,6	7	+106	− 2	+ 7
336	Chippenham	−153,1	− 114,1	− 71,1	74	− 59	+ 38	− 64
		S = −3025,9		S = −1987,2			S = −173	S = +67
		$\frac{S}{30}$ = −100,8		$\frac{S}{30}$ = − 66,0				

ζ	φX	φY	φZ	$X\lambda\omega\varphi$	$Y\lambda\omega\varphi$	$Z\lambda\omega\varphi$
−13	+3158	− 1184	+ 1711	+ 4476	− 1678	+ 2425
+4	− 6225	+11245	− 402	− 4427	+ 7997	− 286
−80	+ 3669	+ 755	+ 8632	+ 1901	+ 391	+ 4472
+67	+ 9139	− 3808	−12757	− 989	+ 412	+ 1380
−87	− 82	− 2454	+ 7117	− 54	− 1620	+ 4698
−28	+ 7397	− 1545	+ 3091	+ 1447	− 302	+ 604
+110	+ 448	− 1148	− 1540	+ 1978	− 5068	− 6798
+76	− 4047	− 7271	− 5214	− 6708	−12393	− 8641
+20	− 917	+ 611	− 1222	− 1280	+ 853	− 1706
+17	− 958	− 1383	− 1809	− 1558	− 2250	− 2943
+220	− 1407	+ 386	− 6072	− 5936	+ 1630	− 25608
+68	− 2542	+ 981	− 3033	− 4218	+ 1628	− 5032
−38	+15022	+ 2953	+ 4879	− 1310	− 257	− 426
+11	+ 1898	+ 1022	− 1606	+ 363	+ 195	− 307
+29	+ 7269	− 2387	− 3147	+10157	− 3335	− 4396
−62	− 3760	+ 2256	+ 9325	− 770	+ 462	+ 1910
−32	− 4662	+ 2858	+ 4813	− 955	+ 585	+ 985
−52	+ 6653	+ 115	+ 5964	− 1433	− 25	− 1284
−82	0	+ 2210	− 4420	0	− 2222	+ 4444
+227	+ 2363	+ 3465	−11918	− 437	− 640	+ 2202
+16	+ 6645	+ 1295	− 1381	+ 1294	+ 252	− 269
−22	− 6115	+ 1398	+ 3843	− 1977	+ 452	+ 1243
+76	− 1300	+ 1300	− 2994	− 2630	+ 2630	− 6057
+63	+ 8091	− 7293	− 8789	+ 9624	− 8803	− 10464
—						
+26	− 282	− 994	− 3692	− 98	− 343	− 1274
−54	− 1467	+ 147	+ 2641	− 1191	+ 119	+ 2144
+76	− 184	− 2668	− 3496	− 324	− 4698	− 6156
+66	− 3230	− 4560	−12540	− 2072	− 2926	− 8045
−23	+ 1328	− 1149	+ 3777	+ 113	− 396	+ 1302
+3	− 5818	+ 9798	− 459	− 2702	+ 4550	− 213
ζ=+602	S=+29084	S=+4851	S=−30708	S=−9706	S=−24800	S=−62094

	Allonia	φ − φ₀		λ − λ₀	λ cos φ	F	Φ	X	Y	
276	Beccles	−92,6		−333,6	−203,3	67	+173	− 60	+ 7	
277	Bedford	−112,0		−213,2	− 130,9	146	+167	− 142	+ 33	
278	Bellingham	+98,7		− 104,6	− 59,8	42	+ 1	+ 42	+ 1	
279	Bettws y Coed	−53,6		− 12,5	− 7,5	176	+146	− 146	+ 99	
280	Bewerley	− 9,5		−212,7	− 125,5	135	+116	− 59	+ 122	
281	Bewdley East	−97,7		−101,5	− 62,0	5	+127	− 3	+ 4	
282	Bewdley West	−97,6		− 100,8	− 61,6	16	+97	− 2	+ 16	
283	Bideford	−179,4		+ 13,3	+ 8,0	88	+177	− 88	+ 4	
284	Bingham	− 62,4		−182,5	− 109,9	25	−56	+ 21	− 14	
285	Birkenhead	− 35,9		− 55,7	− 33,2	19	+18	+ 18	+ 6	
286	Birmingham	−92,4		−126,3	− 77,0	119	−29	+ 92	− 76	
287	Bishop Auckland	+39,8		−140,1	− 81,0	119	−152	− 105	− 56	
288	Bishops Castle	−90,4		− 60,5	− 36,8	74	−174	− 74	− 8	
289	Billerby	−96,6		− 87,9	− 50,0	46	+94	− 3	+ 46	
290	Blakeney	−134,3		− 92,9	− 57,5	71	−123	− 38	+ 60	
291	Blandford	−188,8		−109,9	− 69,4	11	−34	+ 9	− 6	
292	Boothe	+17,4		− 36,2	− 21,1	46	−126	− 27	− 37	
293	Borrowbridge	+4,0		− 155,5	− 91,2	47	+144	− 28	+ 38	
294	Boston	− 61,4		− 238,9	− 143,8	134	+60	+ 67	+117	
295	Boulmer (1)	+85,3		− 145,0	− 82,3	—	—	—	—	
296	" (2)	+85,3		− 145,0	− 82,3	23	−119	− 11	− 20	
297	" (3)	+85,3		− 145,0	− 82,3	29	−27	+ 26	+6 − 13	−17
298	" (4)	+85,3		− 145,0	− 82,3	21	−79	+ 4	− 19	
299	Bourne	− 73,8		−217,5	− 131,6	35	−45	+ 25	− 25	
300	Bourton on the Water	−127,5		−135,1	− 82,4	179	−110	− 61	−168	
301	Bovey Tracey	−144,5		− 18,8	− 11,9	132	−12	+129	− 28	
302	Braintree	−127,3		−272,7	− 168,3	104	+145	− 85	+ 59	
303	Brecon	−123,1		− 35,3	− 21,8	23	−135	− 16	− 16	
304	Brent Tor (1)	−203,9		+ 9,9	+ 6,3	157	+30	+137	+ 79	
305	" " (2)	−203,9		+ 9,2	+ 5,8	39	+26	+ 35	+ 17	
306	Bridgend	−150,2		− 26,0	− 16,2	50	−25	+ 45	− 21	
307	Brigg	− 26,8		−211,0	− 125,4	68	+112	− 25	+ 63	
		S = −2136,5			S = −2048,4			S = −371	S = +282	S =
		$\frac{S}{28}$ = −76,2			$\frac{S}{28}$ = −69,6					

Z	φX	φY	φZ	$X \lambda \cos\varphi$	$Y \lambda \cos\varphi$	$Z \lambda \cos\varphi$
−31	+5556	− 648	+2871	+12198	−1423	+6302
−35	+15904	− 3696	+3920	+18588	−4320	+4582
−129	+ 4145	+ 99	+12732	− 2512	− 60	+7714
+128	+ 7826	−5306	− 6861	+1095	−743	− 960
+10	+ 561	−1159	− 95	+ 7405	−15311	−1255
−97	+ 293	− 391	+9477	+ 186	− 248	+6014
−66	+ 195	−1562	+6442	+ 123	− 986	+4066
−70	+15787	− 718	+12558	− 704	+ 32	− 560
+156	−1310	+ 874	−9734	− 2308	+1539	−17144
+ 7	− 646	− 215	− 251	− 598	− 199	− 232
+100	−8501	+7022	−9240	−7084	+5852	− 7700
−156	−4179	−2229	−6209	+8505	+4536	+12636
+ 3	+6690	+ 723	− 271	+2723	+ 294	+ 110
− 53	+ 290	−4444	+5120	+ 246	−3767	+4341
−18	+5703	− 8058	+2417	+2185	−3450	+1035
−104	−1699	+1133	+19635	− 625	+ 416	+7218
−25	− 470	− 644	− 435	+ 570	+ 781	+ 528
+178	− 182	+ 152	− 712	+ 2554	−3466	−16234
+115	−4113	−7184	−7061	− 9635	−16825	−16537
−120	—	—				
−43						
−46	+ 512	−1450	−5545	− 494	+1399	+5350
−107						
−31	− 1845	+ 1845	+2288	− 3290	+ 3290	+4080
+40	+ 7778	+21420	− 5100	+ 5087	+14011	− 3336
−92	−18641	+ 4046	+13294	− 1535	+ 333	+1095
−42	+10821	− 7511	+5347	+14306	− 9930	+7069
− 8	+1970	+1970	+ 985	+ 349	+ 349	+ 175
+10	−27934	−16108	− 2039	+ 863	+ 498	+ 63
—	(− 7137	− 3466	)	—	—	—
−68	− 6759	+ 3154	+10214	− 729	+ 340	+1102
+172	+ 670	−1688	− 4610	+3135	− 7900	−21569
$S = -171$	$S = +7893$	$S = -20573$	$S = +23673$	$S = +50604$	$S = -34958$	$S = -12047$

y kiekter pontos.

1829

$\varphi = -40$

λ	X	y	Z	sin λ	$X_{sin\lambda}$	$y_{sin\lambda}$	$Z_{sin\lambda}$	cos λ	$X_{cos\lambda}$	$y_{cos\lambda}$	$Z_{cos\lambda}$
0	0,204	−0,079	−0,237	0	0	0	0	1	+0,204	−0,079	−0,237
40	0,165	−0,099	−0,370	+0,643	+0,106	−0,064	−0,238	+0,766	+0,126	−0,076	−283
80	0,188	−0,076	−0,496	+0,985	+0,185	−0,075	−0,489	+0,174	+0,033	−0,013	−0,086
120	0,208	−0,022	−0,593	+0,866	+0,180	−0,019	−0,514	−0,50	−0,104	+0,011	+0,297
160	0,232	+0,059	−0,549	+0,341	+0,079	+0,020	−0,188	−0,940	−0,218	−0,055	+0,516
200	0,266	+0,055	−0,471	−0,341	−0,091	−0,019	+0,161	−0,940	−0,250	−0,052	+0,443
240	0,279	+0,051	−0,433	−0,866	−0,242	−0,044	+0,375	−0,50	−0,140	−0,026	+0,217
280	0,279	+0,099	−0,343	−0,985	−0,275	−0,098	+0,338	+0,174	+0,049	−0,017	−0,060
320	0,280	+0,017	−0,219	−0,643	−0,180	−0,011	+0,141	+0,766	+0,214	+0,012	−0,168
						−0,310	−0,414			−0,296	+0,639

$\varphi = -15$

0	0,259	−0,094	−0,104	0	0	0	0		+0,259	−0,094	−0,104
40	0,241	−0,072	−0,262		+0,154	−0,046	−0,168		+0,185	−0,055	−0,201
80	0,291	−0,014	−0,295		+0,287	−0,014	−0,291		+0,057	−0,002	−0,050
120	0,342	−0,003	−0,303		+0,296	−0,002	−0,262		−0,171	+0,001	+0,152
160	0,344	+0,064	−0,269		+0,118	+0,022	−0,092		−0,323	−0,060	+0,253
200	0,344	+0,050	−0,171		−0,118	−0,017	+0,058		−0,323	−0,047	+0,161
240	0,332	+0,041	−0,157		−0,288	−0,036	+0,136		−0,166	−0,021	+0,079
280	0,325	+0,055	−0,059		−0,320	−0,054	+0,058		+0,057	+0,009	−0,010
320	0,297	−0,015	+0,008		−0,191	+0,010	−0,005		+0,228	−0,012	+0,006
						−0,137	−0,566			−0,281	+0,286

$\varphi = 0$

0	0,302	−0,115	0	0	0	0	0		+0,302	−0,115	0
40	0,310	−0,077	−0,152		+0,199	−0,050	−0,098		+0,237	−0,059	−0,116
80	0,339	−0,007	−0,133		+0,334	−0,007	−0,131		+0,059	−0,001	−0,023
120	0,370	+0,002	−0,101		+0,320	+0,002	−0,087		−0,185	−0,001	+0,051
160	0,353	+0,054	−0,047		+0,121	+0,018	−0,016		−0,332	−0,051	+0,044
200	0,328	+0,049	+0,015		−0,112	−0,017	+0,005		−0,308	−0,046	−0,014
240	0,344	+0,026	+0,019		−0,298	−0,023	−0,016		−0,172	−0,013	−0,010
280	0,349	+0,052	+0,093		−0,344	−0,051	−0,091		+0,061	+0,009	+0,016
320	0,307	−0,027	+0,155		−0,197	+0,017	−0,099		+0,235	−0,021	+0119
						−0,111	−0,543			−0,298	+0,067

$\varphi = +15°$

λ	X	Y	Z	sin λ	X sin λ	Y sin λ	Z sin λ	cos λ	X cos λ	Y cos λ	Z cos λ
0	0,274	−0,115	+0,196	0	0	0	0		+0,274	−0,115	+0,196
40	0,321	−0,071	+0,023		+0,206	−0,046	+0,015		+0,246	−0,054	+0,018
80	0,356	+0,007	+0,067		+0,351	+0,007	+0,066		+0,062	+0,001	+0,012
120	0,360	+0,002	+0,105		+0,312	+0,002	+0,091		−0,180	−0,001	−0,053
160	0,319	+0,032	+0,116		+0,109	+0,011	+0,040		−0,300	−0,030	−0,109
200	0,299	+0,051	+0,189		−0,102	−0,017	−0,065		−0,281	−0,048	−0,178
240	0,336	+0,036	+0,217		+0,291	+0,031	−0,188		−0,168	−0,018	−0,109
280	0,346	+0,041	+0,297		−0,341	−0,040	−0,293		+0,060	+0,007	+0,052
320	0,280	+0,050	+0,316		−0,180	−0,032	−0,203		+0,214	+0,038	+0,242
						−0,144	−0,537			−0,220	+0,071

$\varphi = +40°$

λ	X	Y	Z	sin λ	X sin λ	Y sin λ	Z sin λ	cos λ	X cos λ	Y cos λ	Z cos λ
0	0,215	−0,067	+0,381	0	0	0	0		+0,215	−0,067	+0,381
40	0,270	−0,029	+0,335		+0,174	−0,019	+0,215		+0,207	−0,021	+0,257
80	0,292	+0,024	+0,395		+0,288	+0,024	+0,389		+0,071	+0,004	+0,069
120	0,191	−0,009	+0,412		+0,252	−0,008	+0,357		−0,146	+0,004	−0,206
160	0,256	+0,022	+0,334		+0,088	+0,007	+0,114		−0,240	−0,021	−0,314
200	0,233	+0,063	+0,405		−0,080	−0,021	−0,139		−0,219	−0,059	−0,387
240	0,228	+0,066	+0,496		−0,197	−0,057	−0,430		−0,114	−0,033	−0,248
280	0,199	−0,013	+0,594		−0,196	+0,013	−0,585		+0,035	−0,002	+0,103
320	0,157	−0,064	+0,489		−0,101	+0,041	−0,315		+0,120	−0,049	+0,375
						−0,020	−0,394			−0,244	+0,036

λ	$\varphi = +60$	$\varphi = -60$	$\varphi = 0$		$\varphi = +40$	$\varphi = -40$
	95	65				
-180	+264	-315	-25		190	-244
-160	+276	-304	0		208	-224
-140	+285	-288		+13	226	-208
-120	+301	-270		+25	247	-194
-100	+306	-250		+43	261	-170
-80	+304	-230		+64	264	-145
-60	+288	-213		+76	257	-125
-40	+285	-204		+70	240	-118
-20	+271	-204		+40	217	-128
0	+260	-220		+5	194	-150
+20	+252	-226	-27		180	-177
+40	+250	-252	-48		176	-203
+60	+257	-270	-62		180	-224
+80	+257	-290	-60		185	-244
+100	+261	-307	-68		190	-262
+120	+261	-322	-64		190	-270
+140	+260	-328	-50		188	-269
+160	+261	-322	-40		186	-260
			-424	+316	3759	3615

4895 4825

+272 kisz. -268

közép

4860

$\frac{108}{18}$ kisz. = -6

3702

$\frac{4860}{3702} = 1,313$ $\frac{2\text{ m }60}{2\text{ m }40} = 1,248$

	11 h 9 m	— — — —	207,8	nagy ünő ~~16,8~~	16,8	ab. Ütközés 19,6
	11 h 27 m	— — — —	237,8	erős nagy ünő	16,9	15,4
	12 h 2 m	— — — —	250,0	Ditto	16,9	20,6
	12 h 20 m	— — — —	255,5	bomló	16,9	21,4
	12 h 33 m	— — — —	258,2	nagy ünő	16,95	21,5
	12 h 47 m	— — —	260,0	„ Ditto	17,0	22,0
D. u.	4 h 12 m	— — —	194,0	Dermes	16,85	16,4
	4 h 45 m	— — —	179,3	Dermes	16,8	16,2
	7 h 21		150,0	erős nagy	16,5	15,7
	8 h 0	— — — —	150,0		16,5	15,7
	9 h 14 m	— — — —	151,1	—	16,5	15,5
No. 12	D. 7 h 45 m		163,0	bomlás	15,9	14,9
	10 h 23 m	— — — —	170,0	nagy Dermes	16,1	15,6
	11 h 11 m	— — —	175,7	bomlás	16,1	15,6
D. u.	4 h 30 m	— — —	180,2	erős	16,1	15,1
	7 h 30		178,0	erős		

Nov. 7. 8 11 h 0 187,8

11 h. 25 m 170,4

41 m. 170,1

1 h 15 174,8

d. u 4 h 23 184,2

5 h 12 185,8

ost 9 h 5 — 186,9

Nov. 8

r. 7 h 25 187,0

8 h 10 — 186,9

9 h 5 — 186,5

10 h 15 m 186,8

11 h 10 m 186,7

Dezember — 11 h 16 hm. 186,5

20 m 186,8

11 24 m 186,8

" 29 m 186,9

" 35 — 187,0

42 m 186,8

47 — 186,8

49

51 — 186,8

56 — 187,0

Nov. 6 i am Ende der Linie.

Nov. 7 r. 8 h. 0 187,0

10 h. 187,4 k

Kö dö

12 h 4 m 15 s 517 × dnů

9 m 20 s 140,6 nál ú trojnůh

12 m 0 144,2 trnáho kalad

14 m 148,8 d. kalad

16 m 154,7 1. k.

18 m 159,7

20 m 161,5 × dnů

28 m. 158,7

45 m 159,5

2 h 50 m — 170,8

3 h 37 m 171,2

4 h 11 m 171,6

5 h 0 172,1

November 8 este 9h 14m 169,7

November

r.	7h	27m	169,2	Derült	t=16,2
	8h	15m	170,8	----	
	9h	7m	175,1	Derült	
	9h	20m	176,7	nyp. kevés	
	10h	10m	179,2	nyp. sűrű	
	11h	5m	201,4	nyp. sűrű	
	11h	54m	214,8	borult	t=16,25
	12h	5	214,1	borult	
	12h	27m	205,4	borult	t=16,4
2. n	2h	52m	180,8	Derült	t=16,4
	3h	35m	180,0	----	
	4h	15m	176,1	Derült	t=16,2
	4h	50m	174,1	Derült	
	6h	18m	169,8	----	t=16,2
	7h	8m	169,8		t=16,2
este	9h	28	169,0	csill	t=16,15

November 10

r.	7h	55m	171,8	csill	t=16°2
	9h	18m	175,1	Derült	t=16,15
	9h	48m	177,7	nyp. sűrű	
	11h	9m	181,1	Derült	16,15
	12h	11m	196,3	csill	16,2
	12h	56	196,7	nyp. sűrű	
	3h	38	208,9	Derült	16°5
	4h	40	191,7	Derült	16°5
	8h	22m	161,7	csillagos	16°2
	9h	29	162,6	csillagos	16°2

November 11.

r.	7h	56	170,0	Derült	16°0
	9h	13	172,7	Derült	16°2 alakredő 15°5
	10h	7	177,8	nyp. sűrű De nem a szokás alakúak	16°2 " " 15°6

$$\begin{cases} X = \alpha \dfrac{\partial x_e}{\partial \eta_c} + \beta \dfrac{\partial x_e}{\partial \eta_c} + \gamma \dfrac{\partial x_e}{\partial \eta_c} \\ Y = \alpha \dfrac{\partial y_e}{\partial \eta_c} + \beta \dfrac{\partial y_e}{\partial \eta_c} + \gamma \dfrac{\partial y_e}{\partial \eta_c} \\ Z = \alpha \dfrac{\partial z_e}{\partial \eta_c} + \beta \dfrac{\partial z_e}{\partial \eta_c} + \gamma \dfrac{\partial z_e}{\partial \eta_c} \end{cases}$$

$$\begin{cases} \dfrac{\partial x_e}{\partial \eta_c} = -\dfrac{x_c}{r^3} + 3\dfrac{(x-x_c)^2}{r^5} \\ \dfrac{\partial x_e}{\partial \eta_2} = -\dfrac{x_c}{r^3} + 3\dfrac{(x-y)^2}{r^5} \\ \dfrac{\partial x_e}{\partial \eta_3} = -\dfrac{x_c}{r^3} + 3\dfrac{(x-z)^2}{r^5} \\ \dfrac{\partial y_e}{\partial x_c} = \dfrac{\partial x_e}{\partial y_c} = 3\dfrac{(y-y_c)(x-x_c)}{r^5} \\ \dfrac{\partial z_e}{\partial x_c} = \dfrac{\partial x_e}{\partial z_c} = 3\dfrac{(z-z_c)(x-x_c)}{r^5} \\ \dfrac{\partial z_e}{\partial y_c} = \dfrac{\partial y_e}{\partial z_c} = 3\dfrac{(z-z_c)(y-y_c)}{r^5} \end{cases}$$

$$\begin{aligned} &-\frac{1}{r^3} + 3\frac{(R-\rho\sin(\varphi-\eta))^2}{r^5} \\ &-\frac{1}{r^3} + 3\frac{b}{r^5} \\ &-\frac{1}{r^3} + 3\frac{(R-\rho\cos(\varphi-\eta))^2}{r^5} \\ &= \frac{3b(R-\rho\sin(\varphi-\eta))}{r^5} \\ &= 3\frac{(R-\rho\sin(\varphi-\eta))(R-\rho\cos(\varphi-\eta))}{r^5} \\ &= 3\frac{b(R-\rho\cos(\varphi-\eta))}{r^5} \end{aligned}$$

$$X = \mu\sin(\varphi-\delta)\left\{-\frac{1}{r^3} + 3\frac{(R-\rho\sin(\varphi-\eta))^2}{r^5}\right\} + \beta\frac{3b(R-\rho\sin(\varphi-\eta))}{r^5} + \mu\cos(\varphi-\delta)3\frac{(R-\rho\sin(\varphi-\eta))(R-\rho\cos(\varphi-\eta))}{r^5}$$

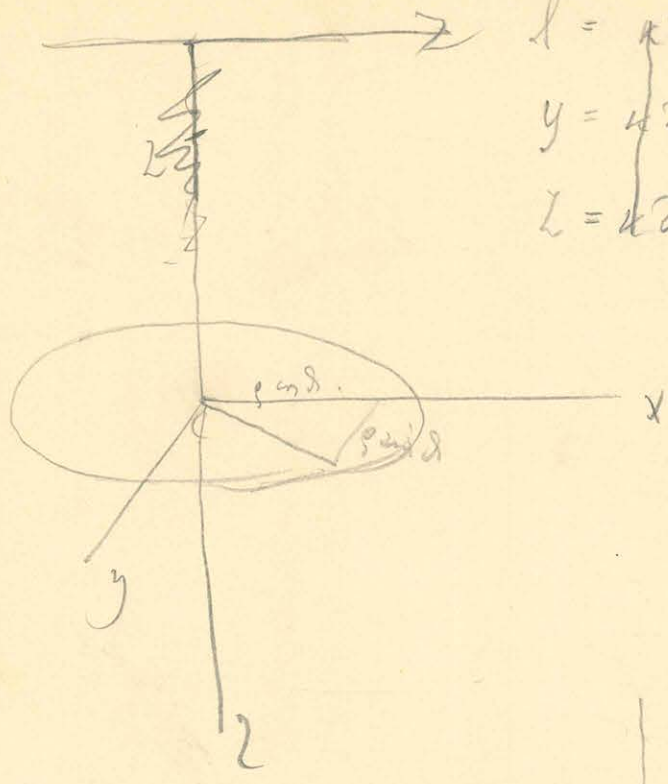
$$Y = \mu\cos(\varphi-\delta)\left\{\frac{3b(R-\rho\sin(\varphi-\eta))}{r^5} + \beta\left\{-\frac{1}{r^3} + 3\frac{b}{r^5}\right\} + \mu\cos(\varphi-\eta)\frac{3b(R-\rho\cos(\varphi-\eta))}{r^5}\right.$$

$$Z = \mu\sin(\varphi-\delta)\left\{3\frac{(R-\rho\sin(\varphi-\eta))(R-\rho\cos(\varphi-\eta))}{r^5}\right\} + \beta\frac{3b(R-\rho\cos(\varphi-\eta))}{r^5} + \mu\cos(\varphi-\delta)\left(-\frac{1}{r^3} + 3\frac{(R-\rho\cos(\varphi-\eta))}{r^5}\right)$$

$$r^2 = R^2 + r^2 - 2R\rho(\sin\varphi\sin\eta + \cos(\varphi-\eta)) + b^2$$

$\gamma \quad \delta \quad \beta \quad b$

$\mu \quad \rho$



$$X = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \, \frac{\rho\cos\delta - x}{R^3}$$

$$Y = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \, \frac{\rho\sin\delta - y}{R^3}$$

$$Z = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \, \frac{c - z}{R^3}$$

$$R = \sqrt{(\rho\cos\delta - x)^2 + (\rho\sin\delta - y)^2 + (c-z)^2}$$

$$R = \sqrt{\rho^2 + x^2 + y^2 - 2\rho(\cos\delta\, x) - 2\rho\sin\delta\, y + (c-z)^2}$$

$x = 0 \qquad y = 0$

$$R = \sqrt{\rho^2 + (c-z)^2}$$

$$\frac{\partial X}{\partial x} = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \left(-\frac{1}{R^3} + 3\frac{(\rho\cos\delta - x)^2}{R^5}\right)$$

$$\frac{\partial X}{\partial y} = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \left(+3\frac{(\rho\cos\delta - x)(\rho\sin\delta - y)}{R^5}\right)$$

$$\frac{\partial X}{\partial z} = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \left(3\frac{(\rho\cos\delta - x)(c-z)}{R^5}\right)$$

$$\frac{\partial Y}{\partial y} = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \left(-\frac{1}{R^3} + 3\frac{(\rho\sin\delta - y)^2}{R^5}\right)$$

$$\frac{\partial Y}{\partial z} = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \left(3\frac{(\rho\sin\delta - y)(c-z)}{R^5}\right)$$

$$\frac{\partial Z}{\partial z} = k\sigma \int\int\int \rho\, d\rho\, d\delta\, d\lambda \left(-\frac{1}{R^3} + 3\frac{(c-z)^2}{R^5}\right)$$

$$\frac{\partial X}{\partial x} = \sigma \int\int \rho\, d\rho\, d\lambda \left(-\frac{2\pi}{R^3} + 3\frac{\rho^2\pi}{R^5}\right) = -2\pi\sigma \frac{\rho\, d\rho}{(\rho^2 + (c-z)^2)^{\frac{3}{2}}} + 3\pi\sigma \frac{\rho^3 d\rho}{(\rho^2 + (c-z)^2)^{\frac{5}{2}}}$$

$$\frac{\partial Y}{\partial y} = \sigma \int\int \rho\, d\rho\, d\lambda \left(-\frac{2\pi}{R^3} + 3\pi\frac{\rho^2}{R^5}\right)$$

$$\frac{\partial Z}{\partial z} = \sigma \int\int \rho\, d\rho\, d\lambda \left(-\frac{2\pi}{R^3} + 3\pi\frac{2(c-z)^2}{R^5}\right)$$

$$\frac{\partial X}{\partial x} = \frac{\partial Y}{\partial y} = -2\pi\sigma \int_0^{\infty} \left(-\frac{1}{\sqrt{\rho^2 + (c-z)^2}}\right) + 3\pi\sigma \int_0^{\infty} \left(-\rho^2 - \frac{2}{3}(c-z)^2\right) \frac{1}{(\rho^2 + (c-z)^2)^{\frac{5}{2}}}$$

$$\frac{\partial X}{\partial x} = \frac{\partial Y}{\partial y} = 2\pi\sigma \left(\frac{1}{\sqrt{r^2 + (c-z)^2}} - \frac{1}{(c-z)}\right) + 3\pi\sigma \left\{\frac{r^2 + \frac{2}{3}(c-z)^2}{(r^2 + (c-z)^2)^{\frac{3}{2}}}\right\} + \frac{2\pi\sigma}{(c-z)} = -\pi\sigma \frac{r^2}{(r^2 + (c-z)^2)^{\frac{3}{2}}}$$

$$\frac{\partial x}{\partial z}, \frac{\partial y}{\partial z}, \frac{\partial x}{\partial z} = 0$$

$$\frac{\partial x}{\partial x} = \frac{\partial y}{\partial y} = -\pi \varrho \frac{x^2}{\left(x^2+(z-z')^2\right)^{\frac{3}{2}}}$$

$$\frac{\partial}{\partial z}\left(\frac{\partial x}{\partial z}\right) = -3\pi \varrho \frac{x^2(z-z')}{\left(x^2+(z-z')^2\right)^{\frac{5}{2}}}$$

Észlelési idő.	Észlelés helye.	Hőmérséklet.	300 allotriköre és függőleges helyzetének redukált értéke.	353 hőmp. coefficienssel 10° C-ra redukált érték.		0° ra redukált barométer állás.
febr 5. d.e 11h	Lk	6·65	314·0	302·2		
7 " "	S	1·00	334·2	302,3		
9 " "	Lk	6·15	314·2	300·6		
11 " "	S	0·45	334·4	300·7		
13 " "	Lk	5·40	317·1	300·9		
15 " "	S	—	Kimaradt érték	—		
17 " "	Lk	4·65	319·2	300·3		
19 " "	S	-0·75	338·1	300·1		
21 " "	Lk.	5·00	317·3	299·7		
23 " "	S	0·50	333·6	300·1		
25 " "	Lk.	6·75	310·4	298·9		
27 " "	S	1·75	328·3	299·2		
márcz 1. " "	Lm	6·00	312·9	298·8		748·6
3 " "	S	3·00	323·0	298·3		723·3
5 " "	Lm	6,80	308,3	297,0		754,6
7 " "	S	3,05	320,8	296,3		724,9
9 " "	Lm	6,25	309,7	296,5		756,8
11 " "	S	3,75	317,7	295,6		728,5
13 " "	Lm	9,35	295,1	292,8		752·9
15 " "	Lm	÷9 kmr 9,75	296,9	295,3		

$$-\frac{1}{(a^2+b^2+c^2-2ax+x^2)^{\frac{3}{2}}}\,x\,dx + 3\frac{(b-y)^2\,x\,dx}{(\quad)^{\frac{5}{2}}}.$$

$$3\int\frac{x\,dx}{(\quad)^{\frac{5}{2}}} = \frac{1}{(\quad)^{\frac{3}{2}}}\left(-1+3a\frac{x-a}{(b-y)^2+(c-z)^2}+2a\frac{(x-a)^2}{((b-y)^2+(c-z)^2)^2}\right)$$

$$\int\frac{x\,dx}{(\quad)^{\frac{3}{2}}} = -\frac{4(a^2+b^2+c^2)-4ax}{4(b^2+c^2)\sqrt{X}}.$$

$$\frac{(a^2+b^2+c^2)-ax}{(b^2+c^2)\sqrt{X}}+\frac{b^2}{(\quad)^{\frac{3}{2}}}\left(-1+3a\frac{x-a}{b^2+c^2}+\frac{2a(x-a)^2}{(b^2+c^2)^2}\right)$$

$$+\frac{c^2}{(\quad)^{\frac{3}{2}}}\left(\qquad\qquad\right)$$

$$3\int\frac{x\,dx}{(\quad)^{\frac{5}{2}}} = -\frac{1}{(\quad)^{\frac{3}{2}}}+a\left(\frac{1}{4(b^2+c^2)(\quad)}+\frac{1}{2(b^2+c^2)^2}\right)\frac{4(x-a)}{\sqrt{(\quad)}}$$

$$=\frac{1}{(\quad)^{\frac{3}{2}}}\left(-1+\frac{4a(x-a)}{b^2+c^2}+\frac{2(x-a)x}{(b^2+c^2)^2\sqrt{\quad}}\right)$$

$$+\frac{a2(x-a)(a^2+b^2+c^2)+(-2ax+x^2)2(x-a)a}{(b^2+c^2)^2}$$

$$-1+\frac{6a(x-a)}{b^2+c^2}+\frac{2a^3(x-a)-2a(x-a)(2ax+x^2)}{(b^2+c^2)^2}$$

$$+\frac{+2a(x-a)^3}{(b^2+c^2)^2}(a^2-2ax+x^2)$$

$$-2\frac{(a^2+b^2+c^2)-ax}{(b^2+c^2)\sqrt{x}}+2\frac{(b^2+c^2)(x-a)}{b^2+c^2\sqrt{x}}.$$

+0,36 $20,1 = k + 5,1\alpha$ 20,46

−0,34 $20,2 = k + 5,42\alpha$ 20,54

−1,46 $18,7 = k + 5,32\alpha$ 20,16 $\alpha = 3,79$

−1,30 $19,85 = k + 5,58\alpha = k + 21,15$

−0,85 $18,55 = k + 5,12\alpha = k + 19,40$

−0,69 $19,7 = k + 5,38\alpha = k + 20,39$

−0,79 $20,55 = k + 5,60\alpha = k + 21,24$

−0,95 $16,6 = k + 4,65\alpha = k + 17,155$

$12,8 = k + 3,62\alpha = k + 13,72$

−0,92 $12,8 = k + 3,4\alpha = k + 12,89$

−0,49 $12,4 = k + 3,77\alpha = k + 14,29$

−0,69 $13,6 = k + 3,48\alpha = k + 13,19$

−1,39 $11,80,7 = k + 2,85\alpha = k + 10,80$

−1,20 $9,6 = k + 4,05\alpha = k + 15,35$

−0,05 $15,3 = k + 4,05\alpha = k + 15,35$

$-\frac{11,48}{14} = -0,82$

12,93

7 | 538 / 15,68 | 77.

7. 7,80

−0,4 $19,40 = k + 5,28\alpha$

−0,177 $12,93 = k + 3,60\alpha$

$6,67 = 1,78\alpha$.

−0,8

+0,8

−0,12 = 600000x

−0,18

−0,15

+28

+68

3,5 / 100 = 600000 + 38

3,5 / 100 m = x

0,9 / 15 m

5,44 19,88

3,57 12,65

1 87 7,23

5,58

3,9

22

5,44 −0,9

5,98 − 4,46

20,03 5,53 1,13

38

4,050 / 321 / 3,79

840

749

910

30000 / m.

3,48

279

2132

2436

1044

13,19

3,3

3,6

96 − 30 − 10

m

56 / m

187 / 728 / 386

361

1620

36 480 / 60,0000 m

1,240

178 / 667 / 375

534

1330

1246

667 / 1780 / 3840

1780

+0,4.

+0,3.

279 / 384 / 30132 / 1137 / 14,40

285 / 379 / 2565 / 1995 / 855

1080 0,8 319,2 / 338,1 / 335,2 / 316,25 / 2,85

300,32 −12

100 m

300.20 / 100 m.

6 / 100 000

215

1895

3795

8014,8

6,5

1681

17

300 / 150 m.

12 / 100 m

Különböző anyagok vonzása

Balaton-i eszköz ennek mellett

Víz

Aluminium hengeres edénybe (Kb. 10 C. magas) 14,077. gramm víz.

Az ónos fellógyorsulás vízre eső = 25,516

Beakasztom a kettős fali súlyra pokrócba.

Súlyost távolra a rúdtól keresztül

$$s = l \frac{T^2 - 0{,}010187\, l}{(T^2 - T'^2) + 0{,}020374\, l}$$

$l = 10{,}15$

Fekvés	T' Rekaí	Előtt
95,8	96,4	96,0
71,8	72,4	72,2

Közép von $T' = 96{,}07$

$T = 72{,}13$

$T' = 0{,}4804$

$T = 0{,}3607.$

Fekvő I állásban erő vízben 43°

II állás 133° erő levegőben.

Elkészült 1904 Nov. 18 este 7 h. 0.

Ülőkéjű súly 87-055 Vízű 220

	este 9 h 22 m	---	229,8	$t = 15°2$
Nov. 19	12 h 45 m		233'0	14'4 alsó ki
r.	8 h. 16 m	------	233,3	14°2 Kinn benn
	9 h 22 m	---	233,7	14°2 ---
	11 h 7 m	---	233,6	14°2 ---
	12 30 m		233,7	14,2
	3 h 37 m	---	233,7	14,1
	5 h 27 m	----	233,75	14,1
	6 h 50 m	---	233,6	14,75
	9 h 25 m	---	233,4	14,0
	12 h 0 m	———	233'3	14'0
Nov. 20 r.	8 h 19 m	---	233,25	14,0 benn
	10 h 37 m	----	233,25	14,1 nyp kinn
	11 h 32 m	-----	233,25	14,2 nyp enn
d. u.	3 h 46 m		233,65	14,3 Deneb
	5 h 44 m		233,20	14,2 ---
	7 h 40 m		233,3	14,2
	2 h 30 m		233'3	14'0 elmult

Nov. 21 reggel	7 h	52 m	233,3	t=14,1	Derült
	9 h	0 m	233,25	t=14,0	Derült
	11 h	4 m	233,45	t=14,0	nagyon szép
	4 h	45 m	233.3	t=14.1	derült
	7 h	22 m	233,25	t=14,15	
	12 h	15 m	233.35	t=14.0	enyhe
Nov. 22 r.	7 h	20 m	233,3	t=14,0	enyhe
	12 h	23 m	233.3	t=14.0	enyhe

Kiváltozások nyugodt időben Nov. 22 d.u. 7 h

(Egyéb 12 h 7 m ——— 312.0) elcsavarhatna

Nov. 23 r.	7 h	20 m	218,9	t=14,0	Derült
	11 h	5 m	218,7	t 14,0	nagyon szép
	1/2 h	25 m	218,9	14,2	nagyon
	3 h	45 m	219,15	14,15	Derült
	7 h	26 m	220,0	14,15	Derült
		31	220,0	"	"
	9 h	22 m	220,2	14,15	"
	3 h	0 m	220.9	14.1	"
Nov. 24 r.	7 h	20 m	220,0	14,1	
	10 h	48 m	220,0	14,15	Derült
	12 h	52 m	220,1	14,2	
	3 h	38 m	220,0	14,2	Derült
	7 h	50 m	219,9	14,25	
	12 h	25 m	219.6	14.3	enyhe
Nov. 25 r.	7 h	31 m	219,3	14,2	hamuz
	10 h	0 m	219,25	14,25	
	1 h	10 m	219,6	14,9	nagyon szép
	7 h	10 m	219,5	14,5	
	12 h	40 m	219.6	14.4	derült
Nov. 26 r	8 h	18 m	219,0	14,4	hamuz
	3 h	20 m	218.8	14.3	nagyon szép
Nov. 27 r.	8 h	7 m	218,8	14,2	