Ms 5107/2. Eötvös L. vegyes jegyzetei

A variométer a földön. A skála, melyen a kitéréseket olvassuk, mm.-ekre van osztva.

Hely	Kitérések	Egyensúly	Kitérés	Skálatávol (cm.)	$\frac{\text{A kitérés fele}}{\text{skálatávol}}$ = a forg. ív mértéke
II.	−23,5 −123,5 −31,0	−75,4	−75,4	118	$\frac{37,7}{1180}$ = = 0,031949 −
II.–III.	−150,5 +110,0 −127,5	−14,2	−14,2	120	$\frac{7,1}{1200}$ = = 0,005917 −
III.	−207,5 +201,4 −171,0	+6,6	+6,6	116·5	$\frac{3,3}{1165}$ = = 0,002833 +
III.–IV.	+132,0 −126,0 +109,5	−2,9	−2,9	117	$\frac{1,45}{1170}$ = = 0,001248 −
IV.	+208,5 −143,0 +178,0	+24,8	+24,8	117	$\frac{12,4}{1170}$ = = 0,010598 +
IV.–I.	−115,0 +202,0 −86,5	+51,0	+51,0	117	$\frac{25,5}{1170}$ = = 0,021795 +
I.	−202,5 +190,4 −168,5	+12,8	+12,8	117	$\frac{6,4}{1170}$ = = 0,005471 +
I.–II.	+52,5 −192,5 +31,5	−75,0	−75,0	117	$\frac{37,5}{1170}$ = − = 0,032137 −
II.	+97,0 −230,0 +68,0	−74,1	−74,1	117	$\frac{37,05}{1170}$ = = 0,031667. −

31949
31667
31616
71
31808

A − jelek bal felől vannak.

A variométer áll a II — III. helyzetben.

Skála-távol	A ki nem téritett var. egyensúlya.	A mágnes távola	Mely sarka néz a var. felé?	Kitérések	Egyensúly	A kitérés nagysága	$\frac{\text{Kitérés fele}}{\text{Skálatáv.}}$
118 cm.	−17,4	200 cm.	D.	−81,0 +198,5 −56,7	+65,1	82,5	0,034958
"	"	"	É.	−199,7 −11,0 −183,2	−101,1	83,7	0,035466
"	"	"	D.	+186,8 −45,0 +160,0	+65,5	82,9	0,035127
"	"	"	É.	+16,0 −208,6 −5,0	−101,9	84,5	0,035805

Közép 0,035379

$$\left(\frac{\partial^2 V}{\partial x^2} - \frac{\partial^2 V}{\partial y^2}\right)\sin 2\alpha + 2\frac{\partial^2 V}{\partial x \partial y}\cos 2\alpha = 0{,}002377\,\delta$$

Variométer Jena

Hely.	Kitérések.	Egyensúly	Kitérés	Skálatávol.	Kitérés kétszerese	ε szög	φ szög.
I – II. IV.–I.	202,1 306,7 212,0	257,0	+7,0	1045	+14,0		+23'03
I.	57,8 433,0 92,5	254,6	+4,6	1770	+9,2	+8'92	
IV.–I I.–II.	146,4 342,1 164,4	249,0	−1,0	1060	−2,0		−3'26
IV. II.	473,2 81,6 437,3	264,4	+17,4	1845	+34,8	+32'43	
III.–IV. II.–III.	370,6 177,5 352,7	269,3	+19,3	1060	+38,6	~~+1°2'72~~	+1°2'73
III.	467,0 77,0 430,4	262,4	+12,4	1870	+24,8	+22'81	
II – III. III.–IV.	341,8 152,8 324,2	242,6	−7,4	1055	−14,8	~~+24'19~~	−24'19
II. IV.	357,0 144,3 337,6	245,6	−4,4	1835	−8,8	−8'22	
I – II IV.–I.	127,9 375,0 151,1	257,6	+7,6	1085	+15,2		+24'11

I. dél, II. kelet, III. észak, IV. nyugat.

$\frac{rr'}{r-r}(Ir^3 - IIr'^3)$

Az „eltérítő" mágnes hatása nélkül az egyensúly: 248,1

Skála-távol (m.m.)	Eltérítő mágnes távola (m.m.)	A kitérített kereszt fordulói	A fordulók redukálva	Az egyensúly-helyzet	A különbség δ	A közepes kitérés	A kitérés ívmértéke (egység sugarú körön)
1040	É. 2360	157,9	158,8				
	+150	301,5	301,3	233,4	−14,7		
	=251 cm.	170,8	171,4			15,05	0,014471
		203,0	203,1				
″	D. 2360	319,0	318,6				
	+150	213,2	213,2	263,5	+15,4		
	=251 cm.						
″	D. 1860	282,0	282,0				
	+150	290,1	290,1	286,3	+38,2		
	=201 cm.	282,7	282,7			38,1	0,036635
″	É. 1860.	253,0	253,0				
	+150	173,0	173,4	210,1	−38,0		
	=201 cm.	246,0	246,0				
″	É. 1460	194,6	194,8				
	+150	123,5	127,9	159,5	−88,6		
	=161 cm.	188,4	188,7			90,75	0,87259
″	D. 1460	265,2	265,2				
	+150	415,0	410,0	341,0	+92,9		
	=161 cm.	278,1	278,1				

2

Mágnesség próbában; lenn.

I.	$+0,005867$	$+0,006603$
I.–II.	$-0,009118$	$-0,052557$
II.	$-0,015347$	$-0,017913$
II.–III.	$+0,003961$	$+0,050145$
III.	$+0,012333$	$+0,012463$
III.–IV.	$-0,005928$	$-0,049044$
IV.	$-0,017823$	$-0,021165$
IV.–I.	$-0,003019$	$+0,043133$

lehr
tiv.
ford.
ved ford.
egy.
kiség
kitag.
pkie.
egyirós

Mágnesek közelebb a forgástengelyhez.

I.	$-0,017758$	$-0,016621$ ~~−0,00[illegible]8~~
I–II.	$-0,022627$	$-0,041964$
II.	$-0,023105$	$-0,024482$
II–III.	$-0,013852$	$+0,006591$
III.	$-0,009957$	$-0,008421$
III–IV.	$-0,019496$	$-0,038596$
IV.	$-0,027152$	$-0,028947$
IV–I.	$-0,022735$	$-0,003108$

016621
008421
−025042

024482
028947
−053429
−025042
−028421

041964
038596
−080560

006591
003108
+003483
−080560
−077077
078421
001394

0,017758
009957
0,027709
050257
0,077966
0,078710
000744

0,023105
027152
0,050257

0,022627
019496
042123
036587
078710

0,013852
0,022735
036587

Májnepégi 213 próba (I. az ablak felől, ~~25,4~~ ~~Fergő~~: lenézve az óra mutató járásával egyező)

$$\tau = t_2 + \frac{t_1 - t_2}{1+\vartheta}$$

124
28,9
95,1

100 } 232 ↑ jobb
90 } ↘ bal

II. táv. 107,9 cm.
Es. = 232,7
τ = 95,3 mp.

219,8 } 219,8) 24,5
244,3 } 244,3) 22,0
222,3 } 222,3

$t_1 = 89$
$t_2 = 101$

$t_1 = 69$ | 94
$t_2 = 124$ | 98

12 6,3

~~II–III. táv. 114,5 cm. egyenlő 254,2~~

22:245 = 0,898
2450
1950
244,3
22:1898 = 11,6
3020
11220
232,7
10:1898 = 5,3
5100
1304

III. táv. 104,6 cm.
Es. 262,9
τ = 94,7 mp.

132,8 } 134,7) 243,7
381,0 } 378,4) 219,4
158,0 } 159,0

89 }
190 }

219,4:243,7 = 0,900
000700

III–IV. táv. 102,9 cm.
Es. 243,9
τ = ~~92,5~~ mp.
93,6

204,5 } 204,6) 74,7
279,3 } 279,3) 67,3
212,0 } 212,0

104 } = t_1
186 }

378,4
219,4:19 = 115,5
29
104
90
262,9

1087:1207 = 0,901
00700

101–89
12:1,9 = 6,3
60

183,5
1087:1901 = 57,2
13650
3430
240,7

IV. táv. 103,8 cm.
Es. 231,5
τ = ~~95,1~~ mp.
τ = 95,1

277,2 } 277,2) 86,9
190,0 } 190,3) 78,2
268,5 } 268,5

69
193

673:747 = 0,901
0200

19:19 = 19
229,3
673:1901 = 35,4
10270
7650
243,9

1542:1714 = 0,899
17080
16540
153,1

IV–I. táv. 109,3 cm.
Es. 246,7
τ = 95,9 mp.

340,5 } 339,7) 176,6
162,3 } 163,1) 158,9
322,4 } 322,0

94
192

104
82
1542:1899 = 81,2
2280
3810
234,3
184
22:1901 = 11,5
2990
10890
92,5

24:1899 = 12,7
5010
13120
95,3
108

787:869 = 0,899
8680
8590

I. táv. 114,2 cm.
Es. 256,7
τ = ~~94,3~~ mp.
94,7 mp.

357,4 } 350,4) 178,0
171,9 } 172,4) 160,2
333,2 } 332,6

99
189

757:841 = 0,90
0100
293,9
757:19 = 39,8
187
160
254,1
11:19 = 5,8
150

190,3
787:1899 = 41,2
2280
8410
231,5

124
55:1899 = 28,9
17020
1828
92,9

I–II. táv. 102,0 cm.
Es. 240,7
τ = 94,0 mp.

304,4 } 304,2) 120,7
183,1 } 183,5) 108,7
292,3 } 292,2

85
189

19:1,9 = 10,0

158,9:176,6 = 0,899
17620
163,1
1589:1899 = 83,6
6980
12830
246,7

94

II. táv. 102,3 cm.
Es. 234,3
τ = 95,3 mp.

325,0 } 324,5) 171,4
151,9 } 153,1) 154,2
307,5 } 307,3

84
192

104
82
22:1,9 = 11,6
30
111
93,6

4:1,899 = 2,1
2020

1602:176 = 0,9
00
172,4
1602:19 = 84,3
82
60
256,7

II–III. táv. 103,5 cm.
Es. 254,1
τ = 96,2 mp.

209,7 } 209,8) 84,1
294,0 } 293,9) 75,7
218,2 } 218,2

91
193

9:1,9 = 4,7
76
140

108

9:1,9 = 4,7
102
5,8
96,2

~~II–III. táv. 103,5 cm. 209,2 / 294,0 / 218,2 — 91 / 193~~

I. mágnes hat a variométerre; középpontja a variométer forgástengelyétől 200 cm. távolban van; I. mágnes a mágneses meridiánban, a variométertől délre, é-fali [illegible] a variométer felé.

I–III. táv. 103,5 cm. Es. 301,9 T = 95,7 mp.	325,6 / 281,0 / 321,0	325,1 / 281,0 / 320,6	44,1 / 39,6	100 / 191
III. táv. 100,3 cm. Es. 262,5 T = 90,5 mp.	341,1 / 192,4 / 326,8	340,3 / 192,6 / 326,2	147,7 / 133,6	70 / 183
III–IV. táv. 104,6 cm. Es. 198,7 T = 92,4 mp.	152,2 / 239,5 / 161,0	153,4 / 239,5 / 161,7	86,1 / 77,8	89 / 185
IV. táv. 103,0 cm. Es. 228,2 T = 99,4 mp.	158,5 / 289,8 / 172,5	159,5 / 289,7 / 173,1	130,2 / 116,6	80 / 201
IV.–I. táv. 103,4 cm. Es. 294,6 T = 95,7	331,2 / 262,0 / 324,3	330,6 / 262,0 / 323,3	68,6 / 61,3	107 / 190
I. táv. 104,5 cm. Es. 256,9 T = 90,4 mp	168,2 / 336,8 / 185,0	169,3 / 336,1 / 185,3	166,8 / 150,8	88 / 181
I.–II. táv. 105,6 cm. Es. 194,5 T = 93,2 mp.	257,4 / 136,0 / 245,6	257,4 / 137,8 / 245,6	119,6 / 107,8	97 / 186
II. táv. 108,3 cm. Es. 230,6 T = 100,2 mp.	104,5 / 341,7 / 130,5	107,8 / 340,9 / 132,4	233,1 / 208,5	79 / 203

Betolva a mágneseket, úgy, hogy belső végük távola a forgástengelytől 44 mm.

I. táv. 111,5 cm.
Es. 230,2
T = 61,6 mp.

258,9 | 258,9 | 54,0
204,8 | 204,9 |
252,8 | 252,8 | 47,9

62,5
123,0

−19,8 : 1115 = 0,0

I–II. táv. 104,3 cm.
Es. 226,4
T = 61,6 mp.

167,5 | 168,3 | 109,8
278,1 | 278,1 |
180,0 | 180,4 | 97,7

71
122
51

−23,6 : 1043 =

II. táv. 108,2 cm.
Es. 225,0
T = 62,0 mp.

~~191,9~~
198,9 | 199,0 | 49
248,0 | 248,0 |
204,4 | 204,5 | 43,5

70
123

−25 : 1082

II–III. táv. 105,4 cm.
Es. 235,4
T = 62,1

321,7 | 321,3 | 161,8
158,6 | 159,5 |
303,2 | 303,0 | 143,5

64,8
124,0
59,2

−14,6 : 1054

III. táv. 102,5 cm.
Es. 239,8
T = 61,4 mp.

288,0 | 287,9 | 90,7
197,0 | 197,2 |
277,8 | 277,8 | 80,6

61,3
122,8
61,5

−10,2 : 1025

III–IV. táv. 103,1 cm.
Es. = 229,9
T = 61,2 mp.

293,8 | 293,7 | 120,5
172,8 | 173,2 |
280,3 | 280,3 | 107,1

61,4
122,2
60,8

−20,1 : 1031

IV. táv. 99,8 cm.
Es. 222,9
T = 61,6 mp.

185,0 | 185,4 | 70,9
256,3 | 256,3 |
193,0 | 193,2 | 63,1

69,2
122,2
53,0

−27,1 : 998 = 0,0

IV–I. táv. 112,6 cm.
Es. 224,4
T = 61,8 mp.

309,0 | 308,8 | 159,3
148,4 | 149,5 |
291,0 | 291,0 | 141,5

59,0
124,0
65

25,6 : 1126 =

479 : 54 = 0,89
470
479 : 189 = 25,3
1010
650
83
204,9
25,3
230,2
2,0 : 189 = 1,1
110

977 : 1098 = 0,89
9860
977 : 189 = 51,7
320
1310
278,1
51,7
226,4
20 : 189 = 10,6
1100

43,5 : 49 = 0,89
430
435 : 189 = 23,0
570
30
248
23,0
225,0
17,00 : 189 = 9,0
1880

1435 : 1618 = 0,89
14620
1435 : 189 = 75,9
1120
1750
159,5
75,9
235,4
5,60 : 189 = 2,9
1820
1190
59,2
62,1

80,6 : 90,7 = 0,89
8040
806 : 189 = 42,6
500
1220
197,2
42,6
239,8

0,200 : 1,89 = 0,1

1071 : 1205 = 0,89
10700
1071 : 189 = 56,7
1260
1260
173,2
56,7
229,9
0,600 : 1,89 = 0,3

631 : 709 = 0,89
6380
631 : 189 = 33,4
640
730
256,3
33,4
222,9
16,20 : 189 = 8,6
1080
135
53
8,6
61,6

1415 : 1593 = 0,89
14080
1415 : 189 = 74,9
920
1640
128
149,5
74,9
224,4
6,00 : 181 = 3,2
330
65
61,8

táv. 112,6 cm.

IV–I.

Es. 246,5
T = 62,2 mp.

−3,5 : 1126 = 0,00

232,8 | 232,8 | 23,5) 42,5
258,9 | 258,9 | 66,0) 84,3
235,5 | 235,5 | 150,3

418 : 189 = 22,1 — 84,3
400 — 62,2
220

26,1
23,4

234 : 261 = 0,89
2520 — 258,9
234 : 185 = 12,4
450 — 246,5
220

137 : 1539 = 0,89
13880 — 304,2
137 : 189 = 72,5
420 — 231,7
920
00 — 61,2
47 : 189 = 0,9
60,3

Es. $T = t_1 - \tau = \frac{\tau}{\vartheta}$

I. táv. 110,1 cm.

231,7
T = 60,3 mp. $T = t_2 + \frac{T}{\vartheta} + \frac{\tau}{\vartheta^2}$

−18,3 : 1181 = 0,0

149,2 | 150,3) 153,9
304,4 | 304,2) 137,0
166,5 | 167,2

1,5) 59,5
61,0) 61,2
122,2

1185 : 1335 = 0,89
11200 — 145,5
1185 : 189 = 62,7
510 — 208,2
1320

I–II. táv. 99,6 cm.

Es. 208,2
T = 61,2 mp

−41,8 : 996 = 0,
0,0

279,0 | 279,0) 133,5
143,9 | 145,5) 118,5
264,0 | 264,0

9,4) 65,9
72,3) 56,0
128,3

9,9 : 189 = 5,2
450

II. táv. 106,2 cm.

Es. 224,0
T = 63,2 mp

−26 : 1062 = 0,0

265,7 | 265,7) 78,4
187,0 | 187,3) 69,4
256,7 | 256,7

12,0) 57
69,0) 70
139,0

694 : 784 = 0,89
6680 — 187,3
694 : 189 = 36,7
1270
1360 — 224,0

13 : 1,89 = 6,8
1560

II–III. táv. 106,2 cm.

Es. 257,0
T = 62,1 mp.

+7 : 1062
= 0,00

237,0 | 237,0) 37,6
274,6 | 274,6) 33,4
241,2 | 241,2

42,5) 47,7
90,2) 78,2
168,4

334 : 376 = 0,89
3320
3120 — 274,6
334 : 19 = 17,6
144
110 — 257,0

III. táv. 104,5 cm

Es. 241,2
T = 60,2 mp.

−8,8 : 1045
0,00

295,5 | 295,4) 102,2
193,0 | 193,2) 90,8
284,1 | 284,0

43,0) 61
104,0) 59,3
163,3

334 : 1888 = 17,6
14520
13040
1212

305 : 19 = 16,1 — 78,2
115
10 — 62,1

III–IV. táv. 108,3 cm.

Es. 208,2
T = 60,8 mp.

−41,8 : 1083
0,0

143,1 | 144,5) 120,3
264,8 | 264,8) 107,0
157,0 | 157,8

44,4) 81,6
126,0) 37,5
163,5

908 : 1022 = 0,89
9040 — 193,2
908 : 189 = 48
1520
080 — 241,2

IV. táv. 102,6 cm.

Es. 220,3
T = 62,6 mp.

−24,7 : 1026
0,0

165,0 | 165,8) 102,8
268,6 | 268,6) 90,9
177,2 | 177,2

14,0) 62,4
76,4) 62,9
139,3

1,7 : 189 = 0,9

107 : 1203 = 89
10260 — 264,8
107 : 189 = 56,6
1250
1160 — 208,2

2,2

909 : 1028 = 0,88
8860 — 268,6
909 : 188 = 48,3
1570
860 — 220,3

441 : 189 = 23,3 — 37,5
630 — 60,8
630
00
0,5 : 1,88 = 0,3

1898 Nov.

Adott $\underline{b}$-vel adott $\underline{V}$ vonó tömeg kifejtettel kecstetett $\frac{a}{c}$ azon értéke mely $H_l - H_t$ értékét végtelen kicsiny t-re a legnagyobbá teszi ...?

$$A = \frac{H_l - H_t}{4\pi . 4} = \Big|_c^a - \Big|_c^b = A.$$

$$\frac{V}{8} = V = abc - b^2c \qquad V \text{ az egész térfogat}$$

$$= b(ac - bc) = bc(a-b) \qquad c(a-b) = q$$

$$A = \operatorname{arctg} \frac{ac}{b\sqrt{a^2+b^2+c^2}} - \operatorname{arctg} \frac{bc}{a\sqrt{a^2+b^2+c^2}}$$

vagy $$A = \operatorname{arctg} \frac{c\sqrt{a^2+b^2+c^2}\left(\frac{a}{b} - \frac{b}{a}\right)}{a^2+b^2+2c^2}$$

tegyük $x = \frac{a}{b}$ akkor:

$$A = \operatorname{arctg} \frac{\frac{q}{b^2}(x^2-1)\sqrt{(x^2+1)(x-1)^2 + \frac{q^2}{b^4}}}{x\left\{(x^2+1)(x-1)^2 + 2\frac{q^2}{b^4}\right\}}$$

$b = 1$-re.

$$A = \operatorname{arctg} \frac{q(x^2-1)\sqrt{(x^2+1)(x-1)^2 + q^2}}{x\{(x^2+1)(x-1)^2 + 2q^2\}}$$

például ~~x = 2~~-re $q = 4$ és $x = 2$-re. $A = 0,639081$ $c = 4$

$q = 1$ és $x = 2$ $A = 0,483459$ " $c = 1$

$x = 3$ $A = 0,386139$ "

$x = 2,5$ $A = 0,445199$

$x = 2,2$ $A = 0,475064$

$x = 1,9$ $A = 0,480498$

$x = 2,1$ $A = 0,481997$

$x = 2,05$ $A = 0,482753$

$x = 2,01$ $A = 0,483335$

$x = 1,99$ $A = 0,483335$

$x = 3$-ra $A = 0,836877$ $c = 2$

$x = 4$-re $A = 0,811709$ $c = \frac{4}{3}$

$x = 3,1$-re $A = 0,840749$

$x = 3,2$-re $A = 0,842664$

$x = 3,3$-ra $A = 0,842858$

$x = 3,24$ $A = 0,842936$

$x = 3,22$ $A = 0,842834$

$x = 3,25$ $A = 0,842965$

$x = 3,26$ $A = 0,842974$ $c = 1,77$

$x = 3,27$ $A = 0,842967$

$$\mathfrak{A} = \frac{q(x^2-1)\sqrt{(x^2+1)(x-1)^2+q^2}}{x\left((x^2+1)(x-1)^2+2q^2\right)} \qquad A = \operatorname{arctg}\mathfrak{A}.$$

~~$q = 10$ re. $x = 5$ re. $A = 1{,}056545$~~ $c = 2{,}5$

~~$x = 4$ $A = 0{,}940786$~~

~~$x = 6$ $A = 1{,}062362$~~ $c = 2$

$q = 10$ re

$x = 4$ — $\mathfrak{A} = 1{,}6897277$

$x = 4{,}2$

$x = 4{,}4$

$x = 4{,}6$ — $\mathfrak{A} = 1{,}7700089$

$x = 4{,}8$ — $\mathfrak{A} = 1{,}7745575$

$x = 5{,}0$ — $\mathfrak{A} = 1{,}7700050$

$x = 6{,}0$ $\mathfrak{A} = 1{,}6600681$

$x = 4{,}79$ $\mathfrak{A} = 1{,}7745577$

$A_{max} = 1{,}0576357$ — $x = 4{,}795$ $\mathfrak{A} = 1{,}7745579$ $c = 2{,}635046.$

$x = 4{,}80$ $\mathfrak{A} = 1{,}7745575$

$x = 4{,}81$ $\mathfrak{A} = 1{,}7745551$

$q = 10$ $a = 4{,}795$ $c = 2{,}635046$ $b = 1$

	$\frac{M_l}{4f\sigma}$	$\frac{M_t}{4f\sigma}$	$\frac{M_t - M_l}{4f\sigma}$
$\lambda = 0$	$-2{,}115271$	$+2{,}115271$	$4{,}230542$
$\lambda = \frac{1}{2}$	$-2{,}110939$	$+2{,}125570$	$4{,}235611$
$\lambda = 1$	$-2{,}097387$	$+2{,}154951$	$4{,}252338$

$\mathfrak{F}$ $\lambda = 1$

$\lambda = 1$ vagyis lineáris

hajlít $\frac{F}{4f\sigma} = -2{,}0973870\,\varphi + 1{,}3355852\,\varphi^3$

tors $\frac{F}{4f\sigma} = +2{,}1549510\,\varphi - 1{,}4894440\,\varphi^3$

$$\mathfrak{F} = 4f\sigma\{-1{,}0635468 \sin 2\varphi + 0{,}0071900 \sin 4\varphi + 0{,}00015410 \sin 6\varphi + 0{,}00000277 \sin 8\varphi\}$$

$\mathfrak{F}$ $\lambda = 1$

A maximális vonzás parallelogrammánál ~~[illegible]~~ az oldalviszonytól függ.

$a=2 \quad b=1 \quad c=1$

	$\frac{M_l}{4f\sigma}$	$\frac{M_t}{4f\sigma}$	$\frac{M_t - M_l}{4f\sigma}$.
$\lambda=0$	$-0,966918$	$+0,966918$	$1,933836$
$\lambda=1$	$-0,787412$	$+1,229946$	$2,017358$
$\lambda=\frac{1}{2}$	$-0,834564$	$+1,036303$	$1,870867$

$q=4 \quad b=1 \qquad a=3,26 \qquad c=1,769911$

	$\frac{M_l}{4f\sigma}$	$\frac{M_t}{4f\sigma}$	$\frac{M_t - M_l}{4f\sigma}$.
$\lambda=0$	$-1,685948$	$+1,685948$	$3,371896$
$\lambda=1$	$-1,632589$	$+1,786210$	$3,418799$

$b=1 \quad a=3,26 \quad c=1,769911 \quad \lambda=1$ re, egy kissé.

longitud. $\frac{F}{4f\sigma} = -1,6325891\,\varphi + 0,909323\,\varphi^3$

trans $\frac{F}{4f\sigma} = +1,786210\,\varphi - 1,322841\,\varphi^3$.

ebből

$$F = 4f\sigma l^2 \left\{ -0,8566506 \sin 2\varphi + 0,0192512 \sin 4\varphi + 0,0006779 \sin 6\varphi - 0,0000035 \sin 8\varphi \right\}$$

próbálni.

ebből

$$F = 4f\sigma l^2 \left\{ -0,8569046 \sin 2\varphi + 0,0191422 \sin 4\varphi + 0,0007349 \sin 6\varphi + 0,0003018 \sin 8\varphi \right\}$$

$\lambda = \frac{1}{2}$ $\quad a = 10$ $\qquad 8{,}471145$

$$\text{hajlít} = -2{,}1109394 + 1{,}3920679\,4\varphi^2$$

$$\text{hossz} = +2{,}1255704\varphi - 1{,}4310469\,4\varphi^2 . \qquad 116967$$

$$0{,}014631 = 8\alpha_4 + 16\alpha_8$$
$$0{,}038989 = \frac{64}{3}\alpha_4 + \frac{512}{3}\alpha_8$$

$$0{,}0018289 = \alpha_4 + 2\alpha_8$$
$$18276 = \alpha_4 + 8\alpha_8$$

$$\alpha_8 = -0{,}0000002 = 0 .$$

$$\alpha_4 = 0{,}0018289$$

$$4\alpha_4 = 0{,}0073126$$

$$-4{,}226509 = 4\alpha_2 + 12\alpha_6$$
$$-2{,}8237 15 = \frac{8}{3}\alpha_2 + 72\alpha_6$$

$$-1{,}0591272 = \alpha_2 + 3\alpha_6 \quad 292$$
$$-1{,}0588932 = \alpha_2 + 27\alpha_6 .$$
$$+0{,}0002340 = 24\alpha_6$$

$$\alpha_6 = 0{,}0000097\overset{5}{} \qquad 2925$$

$$16\alpha_6 = 0{,}0001560 .$$

$$\alpha_2 = 1{,}0591564 .$$

$$-1{,}0591564 \sin 2\varphi + 0{,}0018289 \sin 4\varphi + 0{,}0000097 5 \sin 6\varphi + 0 .$$

1,0576356, 0,0015208
1,0591564,
1,0625468 0,0043904

$$0{,}0071900 = k + \mu$$
$$0{,}0073156 = k + \frac{\mu}{4}$$
$$-0{,}0001256 = \frac{3}{4}.$$

0,0005024
+ 0,0001675
71900
0,0073575

$$\frac{k}{4} + \frac{\mu}{16} = 0{,}0015208$$

$$k + \mu = \cancel{0{,}0043904} . \quad 0{,}0059112$$

$$k + \frac{\mu}{4} = \cancel{0{,}0014778} \quad 0{,}0060832$$

$$\frac{3}{4}\mu = -0{,}0001720$$

$$\frac{\mu}{4} = -0{,}0000573 3$$

$$\mu - 0{,}0002293 2 \quad 59112$$

0059112
2193
0,0061305

~~1,059~~

1,0591564.
576356
0,0015208.
15418
-0,0000210
336.

16
21
16
λ^2

126
16
2.86.

$$F = 4\mu\sigma l^2 \Big\{\Big(-\big(\overset{1{,}0576356}{\cancel{1{,}057\,106}} + 0{,}0061405\lambda^2 - 0{,}000\overset{3360}{2293 2}\lambda^4\big)\sin 2\varphi + \big(0{,}0073575\lambda^2 - 0{,}0001675\lambda^4\big)\sin 4\varphi$$
$$+ \lambda^4\, 0{,}0001541 \sin 6\varphi + \lambda^6\, 0{,}0000027 7 \sin 8\varphi \Big\}$$

X Quadratikus formulával végzés $\alpha_2 = -1{,}0576356$ $\left(+ 0{,}0061671\lambda^2\right.$
ered otól $\lambda = \frac{1}{2}$ -ig.

$$F = 4\mu\sigma l^2 \Big\{\Big(-1{,}0576356 + 0{,}0061671\lambda^2 - 0{,}0003360\lambda^4\Big)\sin 2\varphi + \Big(0{,}0073575\lambda^2 - 0{,}0001675\lambda^4\Big)\sin 4\varphi$$
$$+ \lambda^4\, 0{,}0001541 \sin 6\varphi + \lambda^6\, 0{,}0000277 \sin 8\varphi\Big)\Big\}$$

lásd túloldalon hozzá való quadratikus anyag.

Quadratikus oszlop. $a=1 \quad b=1 \quad c=2,635046.$

$$\lambda=\frac{1}{2}.$$

$\lambda=\frac{1}{2}$ re véges húr egyenlet $\frac{F}{4fol^2}=0,165894\varphi-0,436585\varphi^3$ 1)

ebből kettős formula
$$4\alpha_4+8\alpha_8=0,165894$$
$$\frac{64}{6}\alpha_4+\frac{512}{6}\alpha_8=0,436587$$

$\frac{1}{2}$ re kettős formula $F=0,0416547\sin 4\varphi-0,0000906\sin 8\varphi$

---

legjobban a 45 fok körül $\left(\frac{\partial F}{\partial\varphi}\right)_{45}\frac{1}{4fol^2}=-0,1674336.$ 2)

1) és 2 ből hármas formula.

$$4\alpha_4+8\alpha_8+12\alpha_{12}=0,165894$$
$$\frac{64}{6}\alpha_4+\frac{512}{6}\alpha_8+\frac{1728}{6}\alpha_{12}=0,436585$$
$$4\alpha_4-8\alpha_8+12\alpha_{12}=0,1674336$$

$$\frac{F}{4fol^2}=0,0416617\sin 4\varphi-0,0000962\sin 8\varphi+0,0000014\sin 12\varphi.$$

véges húr λ ra $\alpha_4=0,1661723 \qquad \frac{\alpha_4}{4}=0,0415431$

$$(\alpha)_{\lambda=\frac{1}{2}}=0,0415431+\beta\lambda^4=0,0416617 \qquad \beta=0,0018976.$$

.5421
1186

$\lambda=0$ tól $\lambda=\frac{1}{2}$ ig.

$$\cancel{\frac{F}{4fol^2}=(0,0416617\lambda^2+0,0018976\lambda^4)\sin 4\varphi-0,0000962\lambda^6\sin 8\varphi}$$
$$\cancel{+0,0000014\lambda^{10}\sin 12\varphi.}$$

$\lambda=0$ tól $\lambda=\frac{1}{2}$ ig

$$\frac{F}{4fol^2}=(0,1661723\lambda^2+0,0018976\lambda^4)\sin 4\varphi-0,0061568\lambda^6\sin 8\varphi$$
$$+0,0014336\lambda^{10}\sin 12\varphi.$$

$b = 1$ re. Quadratikus alapú $\varphi = 45$ fokos négyzetes [illegible] legyen lejtőszöge 1 re.

$$F = \frac{4\sqrt{5}}{\sqrt{2}} l^2 w \left(\frac{1}{l} \Bigg/ \begin{matrix} b+lk \\ b-lk \\ c \end{matrix} + \frac{1}{l} \Bigg/ \begin{matrix} b+lk \\ b+lk \\ c \end{matrix} - \frac{1}{l} \Bigg/ \begin{matrix} b-lk \\ b-lk \\ c \end{matrix} - \frac{1}{l} \Bigg/ \begin{matrix} b-lk \\ b+lk \\ c \end{matrix} \right)$$

$$+ \frac{4\sqrt{5}\, l^2}{\sqrt{2}} w \left\{ \left(\frac{1}{l} - 2k \right) \left(\Bigg// \begin{matrix} b+lk \\ b-lk \\ c \end{matrix} - \Bigg// \begin{matrix} b-lk \\ b-lk \\ c \end{matrix} \right) + \left(\frac{1}{l} + 2k \right) \left(\Bigg// \begin{matrix} b+lk \\ b+lk \\ c \end{matrix} - \Bigg// \begin{matrix} b-lk \\ b+lk \\ c \end{matrix} \right) \right\}$$

$$+ \frac{4\sqrt{5}\, l^2}{\sqrt{2}} w \left\{ \frac{c}{l} \left\{ \Bigg/// \begin{matrix} b+lk \\ b-lk \\ c \end{matrix} - \Bigg/// \begin{matrix} b-lk \\ b-lk \\ c \end{matrix} \right\} + \frac{c}{l} \left(\Bigg/// \begin{matrix} b+lk \\ b+lk \\ c \end{matrix} - \Bigg/// \begin{matrix} b-lk \\ b+lk \\ c \end{matrix} \right) \right\}$$

$$\cancel{\frac{4\sqrt{5}}{\sqrt{2}} (b-lk)\, l = 2\sqrt{5}\, l^2}$$

$$\cancel{\frac{4\sqrt{5}}{\sqrt{2}} b l = 4\sqrt{5}} \, l^2$$

$$1 + \frac{1}{2\sqrt{2}}$$

2,4225

$$A_{II} - A_{I} = V_{II} - V_{I} = \int_0^{\frac{\pi}{2}} F d\vartheta = \int_0^{\frac{\pi}{2}} \alpha_2 \sin 2\vartheta \, d\vartheta + \int_0^{\frac{\pi}{2}} \alpha_4 \sin 4\vartheta \, d\vartheta = 4/\sigma \, \alpha_2$$

$$-\frac{A_{II}-A_{I}}{4/\sigma l^2} = \int_c^b a - \int_c^a b - \frac{\lambda^2}{12} abc \left[\underbrace{\frac{1}{(b^2S^2+a^2c^2)S}\left(3 - \frac{b^2}{S^2} - 2\frac{(S^2+b^2)^2}{b^2S^2+a^2c^2}\right)}_{s_1} - \underbrace{\frac{1}{(a^2S^2+b^2c^2)S}\left(3 - \frac{S^2}{S^2} - 2\frac{(S^2+a^2)^2}{a^2S^2+b^2c^2}\right)}_{s_2} \right]$$

$S^2 = 30,935492$ $\qquad S = 5,561968$

$$-s_1 = \frac{1}{(30,935492 + 22,992025 c^2)\,5,561968}\left[3 - 2\frac{1019,8756}{N} - \frac{1}{30,935492}\right] = 0,0072973590$$

159,64437
30,93549
190,57986 = N

1059,9991

5,3514343
7,7028686
0323253
7,7351939

53,927517

$$-s_2 = \frac{1}{(22,992025 \cdot 30,935492 + c^2)\,5,561968}\left[3 - 2\frac{2908,1771}{N} - \frac{22,992025}{30,935492}\right] = 0,0014623439$$

0,0058350151

711,26961
6,94347
718,21308 = N

3994,6782

4,0491842
5,0983684
7432248
5,8415932

0,027978897
0,074005469

~~0,00[illegible]~~ λ^2

0,006167122 λ^2

0,0

1,0576256
15418
1,0591774
00000210
1,0591564

$$\mathcal{H} = -\left\{ \Big|_2^{1-l} + \Big|_2^{1+l} \right\} + \frac{1}{l}\left[(1+l)\Big|_{2}^{1}{}^{1+l} - (1-l)\Big|_{2}^{1}{}^{1-l} + \left(\underline{II}_2^{1}{}^{1+l} - \underline{II}_2^{1}{}^{1-l} \right) + 2\left(III_2^{1}{}^{1+l} - \underline{III}_2^{1}{}^{1-l} \right) \right]$$

$$\Big|_2^{1-l} = \operatorname{arctg} \frac{2(1-l)}{\sqrt{5+(1-l)^2}}$$

$$\Big|_2^{1+l} = \operatorname{arctg} \frac{2(1+l)}{\sqrt{5+(1+l)^2}}$$

$$\Big|_{2}^{1}{}^{1+l} = \operatorname{arctg} \frac{2}{(1+l)\sqrt{5+(1+l)^2}}$$

$$\Big|_{2}^{1}{}^{1-l} = \operatorname{arctg} \frac{2}{(1-l)\sqrt{5+(1-l)^2}}$$

$$\left(\underline{II}_2^{1}{}^{1+l} - II_2^{1}{}^{1-l} \right) = \log \frac{\sqrt{(1+l)^2+1}}{\sqrt{(1-l)^2+1}} \, \frac{2+\sqrt{5+(1-l)^2}}{2+\sqrt{5+(1+l)^2}}$$

$$\left(\underline{III}_2^{1}{}^{1+l} - \underline{III}_2^{1}{}^{1-l} \right) = \log \frac{\sqrt{(1+l)^2+4}}{\sqrt{(1-l)^2+4}} \, \frac{1+\sqrt{5+(1-l)^2}}{1+\sqrt{5+(1+l)^2}}$$

+) December 5-én újra számítva $= 0,624405$

$l = 1$ re $\mathcal{H} = 0,\cancel{624381}$ +)

$l = 0,9$ re $\mathcal{H} = 0,516420$

$l = 0,8$ re $\mathcal{H} = \cancel{0,414779}$ $\cancel{0,3926242 \text{ Jan. 4.}}$ $= 0,4145142$ Jan. 5.

$l = 0,7$ $\mathcal{H} =$

$l = 0,6$ $\mathcal{H} = 0,237561$

$l = 0,5$

$l = 0,4$ $\mathcal{H} =$

$l = 0,3$ $\mathcal{H} = \cancel{0,06088}$ 0,059916 Jan. 4.

$$\mathcal{H} = \alpha l + \beta l^2$$

$l = 0,3$ ra $\mathcal{H} = 0,06088$

és $l = 0,9$ re $\mathcal{H} = 0,51642$

tehát $l = 0,8$-tól $l = 1$-ig

~~$\mathcal{H} = 0,095001 l + \beta$~~

$\mathcal{H} = 0,095001\, l + 0,529350\, l^2$

tehát $l = 0$-tól $l = 0,8$-ig

$\mathcal{H} = 0,01360\, l + 0,63108\, l^2$

A rúd felére jutó nyomaték $= \kappa \int_0^{12,125} l^2 \left(0,01360 \frac{l}{a} + 0,63108 \frac{l^2}{a^2} \right) dl = \kappa \frac{l^4}{4} \frac{\alpha}{a} + \kappa\beta \frac{l^5}{5 a^2}$

$a = 14,925$

vagyis $= m l^2 \left(\alpha \frac{l}{4a} + \beta \frac{l^2}{5a^2} \right) = m \frac{l^2}{3} \left(\alpha \frac{3}{4} \frac{l}{a} + \beta \frac{3}{5} \frac{l^2}{a^2} \right)$

$= \frac{m l^2}{3} 0,25719 = m l^2 \, 0,08573$

vége.

ezek szerint a rúdra nézve a forgási momentum állandója

$$A = f\frac{m\,l^2}{3}\,0{,}25719$$ a hol m a rúd tömege $m = 7{,}203$

a rúd hossza $l = 12{,}125$

A rúdon ~~…~~ a két lyukas golyóra:

$$B = f M \lambda^2 U_0 \left(1 + \frac{2}{5}\,\frac{U_0 + \frac{B}{a^2}\lambda^2}{\lambda^2 U_0}\,r^2 + \frac{3}{35}\,\frac{B'}{a^2\lambda^2 U_0}\,r^4\right) + f\mu U_0 \lambda^2 -$$

$$- f\mu\,(\lambda - r + 0{,}445)^2\,U_{(\lambda - r + 0{,}445)}$$

a hol M a két lyukas golyó össz tömege $= 60{,}006$

a golyó középpontjának távolsága $\lambda = 12{,}79$

a golyó sugara $r = 0{,}955$

a négyzetes [illegible] fél oldala $a = 14{,}925$

a golyó [illegible] $U_0 = 0{,}095001\,\frac{\lambda}{a} + 0{,}529250\,\frac{\lambda^2}{a^2}$

a golyóban a lyuk hossza $= 0{,}89$

a lyuk sugara ~~átmérője~~ $= 0{,}1765$

ennek $\frac{\mu}{M+\mu} = \frac{\pi\,0{,}1765^2\,0{,}89}{\frac{4}{3}\pi\,0{,}955^3}$ és ebből $\mu = 1{,}467$.

$U_0 = 0{,}47015$

$U_{(\lambda - r + 0{,}445)} = 0{,}43652$

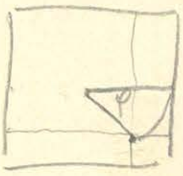
$$B = f M \lambda^2 U_0 \cdot 1{,}006113 + f \cdot 16{,}256 = f \cdot 4659{,}47 = f M \lambda^2\,0{,}4749$$

$$\frac{f M \lambda^2\,0{,}4749 + f\frac{m}{3}\,l^2\,0{,}25719}{f M \lambda^2 + f\frac{m}{3}\,l^2} = 0{,}46735$$

Négyzetes oszlopban $c=2$ $b=1$ $a=1$

$l=1$ re

Pontonkint $\varphi=0$. pontban.



$$V_0 = +4/\sigma\, l^2 \cdot 2{,}854519$$

$\varphi=45°$-ra $$V_{45°} = +4/\sigma\, l^2\, 2{,}937913.$$

$$U_1 = 2\Big(U_1\Big)_{2}{\Big|}_{1-\frac{1}{\sqrt2}}^{1-\frac{1}{\sqrt2}} + 2\Big(U_1\Big)_{2}{\Big|}_{1+\frac{1}{\sqrt2}}^{1+\frac{1}{\sqrt2}} + 4\Big(U_1\Big)_{2}{\Big|}_{1+\frac{1}{\sqrt2}}^{1-\frac{1}{\sqrt2}}$$

$\cancel{(1-k^2)}/\ \cancel{\varphi = \quad V}$

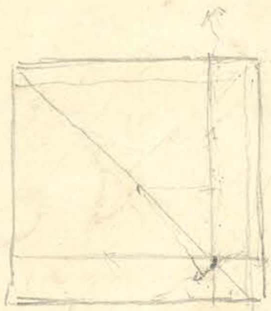
$$V_{45}-V_0 = +\frac{\alpha_4}{2} = 0{,}083394 \qquad \alpha_4 = 0{,}166788$$

ebből és $4\alpha_4 + 8\alpha_8 = 0{,}624405$-ből

$$F = +4/\sigma\, l^2\left(0{,}166788 \sin 4\varphi - 0{,}0053434 \sin 8\varphi\right)$$

ebből $$F_0 = 4/\sigma\, l^2\left(0{,}667152\,\varphi - 0{,}042747\right)$$

<u>$\varphi=45°$ körüli végtelen kicsiny lengések.</u>



$b=1$ $l=1$-re.

$$\begin{aligned}F = +\frac{4/\sigma}{\sqrt2}\Bigg[\, & l(1+k)\Big|_{c}^{l(1+k)}{}_{l(1-k)} + l(1-k)\Big\|_{c}^{l(1+k)}{}_{l(1-k)} + c\,\Big|\!\Big|\!\Big|_{c}^{l(1+k)}{}_{l(1-k)} \\ & + l(1+k)\Big|_{c}^{l(1+k)}{}_{l(1+k)} + l(1+k)\Big\|_{c}^{l(1+k)}{}_{l(1+k)} + c\,\Big|\!\Big|\!\Big|_{c}^{l(1+k)}{}_{l(1+k)} \\ & - l(1-k)\Big|_{c}^{l(1-k)}{}_{l(1-k)} - l(1-k)\Big\|_{c}^{l(1-k)}{}_{l(1+k)} - c\,\Big|\!\Big|\!\Big|_{c}^{l(1-k)}{}_{l(1-k)} \\ & - l(1-k)\Big|_{c}^{l(1-k)}{}_{l(1+k)} - l(1+k)\Big\|_{c}^{l(1-k)}{}_{l(1+k)} - c\,\Big|\!\Big|\!\Big|_{c}^{l(1-k)}{}_{l(1+k)}\Bigg]\, l\omega \\ & - 2/\sigma\Bigg[\Big|_{c}^{l(1-k)}{}_{l(1-k)} + \Big|_{c}^{l(1-k)}{}_{l(1+k)} + \Big|_{c}^{l(1+k)}{}_{l(1-k)} + \Big|_{c}^{l(1+k)}{}_{l(1+k)}\Bigg]\, l\omega.\end{aligned}$$

[illegible] $-2/\sigma\left\{\Big\|_{c}^{l(1+k)}{}_{l(1-k)} - \Big|\!\Big|\!\Big|_{c}^{l(1-k)}{}_{l(1-k)}\right\} + 2/\sigma\left\{\Big\|_{c}^{l(1+k)}{}_{l(1+k)} - \Big\|_{c}^{l(1-k)}{}_{l(1+k)}\right\} l\omega$

$$0{,}732668$$
$$0{,}254256$$
$$\overline{0{,}986924}$$

$49'$

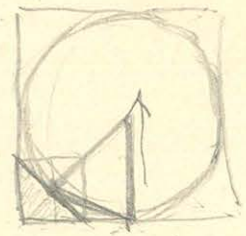
$$16\,\alpha_8 = 0{,}438635 \,/\, 0{,}027415$$

118

66

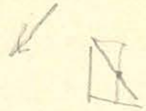
75

$$\alpha_8 = +0{,}027415$$
$$\alpha_{12} = -0{,}024569$$
$$\alpha_4 = +0{,}174979$$



$$\alpha_4 + 3\alpha_{12} = 0{,}101272$$

$$\alpha_4 + \frac{1}{3}\alpha_{12} = 0{,}166788$$



$$0{,}174979$$
$$54830$$
$$\overline{0{,}229809}$$
$$73707$$
$$\overline{0{,}156102}$$
$$624408$$

$$174979$$
$$128537$$
$$\overline{0{,}046442}$$
$$185768$$

$$\frac{8}{3}\alpha_{12} = -0{,}065516$$

$$0{,}196548$$
$$0{,}024569$$

$$101272$$
$$73707$$
$$\overline{174979}$$

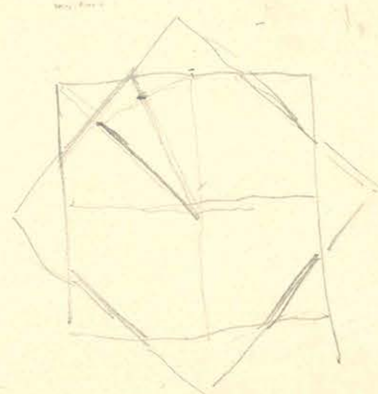
$$174979$$
$$8190$$
$$\overline{166789}$$
$$166788$$

$$0{,}221121$$
$$-0{,}663363$$

$$144$$
$$12$$
$$\overline{144}$$

6.

$$\frac{1}{6}64\,\alpha_4 + \frac{1}{6}512\,\alpha_8 + 1728\,\frac{1}{6}\,\alpha_{12}$$



$$\frac{64}{6}\left(\alpha_4 + 8\alpha_8 + 27\alpha_{12}\right)$$

$$0{,}219320$$
$$174979$$
$$\overline{0{,}394299}$$

$$0{,}667152$$
$$42747$$
$$\overline{624229}$$

$$\cancel{\alpha_4 + \alpha_8 + \alpha_{12}}$$

$$4\alpha_4 + 8\alpha_8 + 12\alpha_{12} = 0{,}624405$$
$$-4\alpha_4 + 8\alpha_8 - 12\alpha_{12} =$$

~~1707107~~

3

0,477121
0,234449 −1
0,242672
0,621336

0,606654
0,667056
0,939598 −1
621336
0,560934

0,748912 −1
362216
0,111128
0,466709 −1
0,577837 −1

0,378301

~~470~~

0,765552
477121
0,288431

0,144216

0,667056
0,710544
0,956512 −1
144216
0,100728

0,003150 −1
362216
0,365366 −1
0,232261
0,597627 −1

0,395938
0,378301
0,066490
0,322224
0,128977
0,567858
1,859788

0,839743
0,611275
0,228468

0,114234.

0,368350
0,468146
0,900204 −1
114234
0,014438

0,159507 −2
362216
0,521723 −2

1,347607
774899
2,122506
1859788
0,262718

[illegible]

0,114234

0,638775
0,683079
0,955736 −1
114234
0,069970

0,844912 −2
362216
0,207128 −1

0,419490 −1
150515
0,268975 −1

0,185770

$(1-k)^2\Big|\begin{smallmatrix}1-k\\1-k\\2\end{smallmatrix}$ ~~+(1+k)^2~~ $= (1-k)^2 \cdot$ ~~0,780087~~ 0,774899

$(1-k)^2\Big|\begin{smallmatrix}1-k\\2\\1-k\end{smallmatrix} = (1-k)^2$ ~~0,780087~~

$4\Big|\begin{smallmatrix}2\\1-k\\1-k\end{smallmatrix} = 4 \cdot$ ~~0,021220~~ 0,020997.

$(1+k)^2\Big|\begin{smallmatrix}1+k\\1+k\\2\end{smallmatrix} = (1+k)^2 \cdot 0{,}567858$

$(1+k)^2\Big|\begin{smallmatrix}1+k\\2\\1+k\end{smallmatrix} = (1+k)^2\, 0{,}567858$

$4\Big|\begin{smallmatrix}2\\1+k\\1+k\end{smallmatrix} = 4 \cdot 0{,}435077$

$2(1-k)^2\Big|\begin{smallmatrix}1-k\\1+k\\2\end{smallmatrix} = 2(1-k)^2 \cdot 1{,}347607$

$2(1+k)^2\Big|\begin{smallmatrix}1+k\\2\\1-k\end{smallmatrix} = 2(1+k)^2\, 0{,}128977$

$8\Big|\begin{smallmatrix}2\\1-k\\1+k\end{smallmatrix} = 8 \cdot 0{,}094212$

Pars algebr. =
0,132951
0,083988
3,309724
1,740308
0,231212
0,751733
0,753696
~~7,005398~~
7,003612

~~$2(1-k)\log\frac{2,314\,25}{1,72847} =$~~

~~Ugyanaz =~~

~~$(1-k)^2\log\frac{4,02136}{0,02136} =$~~

—

$2(1-k)\log\frac{2{,}335341}{1{,}749555} = 2(1-k)M\cdot 0{,}125421$

Ugyanaz

$(1-k)^2\log\frac{4{,}042448}{0{,}042448} = (1-k)^2 M \cdot 1{,}978788$

—

$2(1+k)\log\frac{4{,}84215}{1{,}42793} = 2(1+k)M\, 0{,}530332$

Ugyanaz

$(1+k)^2\log\frac{5{,}13504}{1{,}13504} = (1+k)^2 M\, 0{,}655533$

—

$4(1+k)\log\frac{2{,}93864}{2{,}35286} = 4(1+k)M\, 0{,}096550$

$4(1-k)\log\frac{4{,}35286}{0{,}93864} = 4(1-k)M\, 0{,}666276$

$2(1-k^2)\log\frac{4{,}64575}{0{,}64575} = 2(1-k^2)M\, 0{,}856992$

~~Pars log~~

Pars log = 18,75526
7 00361
11,75165
2,93791[3]

Expectata

0,268350
0,242929
0,125421

~~0,9~~
0,098370-1
0,466709-1
0,301030
0,866109-2

0,606645
0,627857-2
1,978788

0,296400
0,933479-2
0,229819-1

0,685039
0,154707
0,530332

0,724548-1
0,232261
0,301030
0,257839

0,710544
0,055011
0,655533

0,876595-1
0,464522
0,281117

0,468146
0,371596
0,096550

0,984775-2
0,232261
0,602060
0,819096-1

0,638775
0,972499-1
0,666276-1

0,823654-1
466709-1
602060
0,892423-1

0,667056
0,810064-1
0,856992

0,932977-1

0,07347[illegible]
0,169754
1,810667
1,910368
0,659220
0,780590
0,856992
0,073470
1,810667
8,145298

0,910907
362216
1,273123

0,667152

667152
$4d_4 + 8d_8 =$ 624405
0,042747
0,0053434

Quadrat.

$a + l\cos\varphi = 3{,}707107$ — $13{,}74263$

$a - l\cos\varphi = 2{,}292893$ — $5{,}25734$

~~$a + l\sin\varphi$~~

$b + l\sin\varphi = 1{,}707107$ — $2{,}91422$

$b - l\sin\varphi = 0{,}292893$ — $0{,}08579$

$\sqrt{(a+l\cos\varphi)^2+(b+l\sin\varphi)^2+4} = 4{,}54498$ $0{,}657532$

$\sqrt{(a+l\cos\varphi)^2+(b-l\sin\varphi)^2+4} = 4{,}22238$ $0{,}625557$

$\sqrt{(a-l\cos\varphi)^2+(b+l\sin\varphi)^2+4} = 3{,}48878$ $0{,}542675$

$\sqrt{(a-l\cos\varphi)^2+(b-l\sin\varphi)^2} = 3{,}05665$ $0{,}485246$

2,91422	2,91422	13,74263	13,74263
5,25734	13,74263	0,08579	2,91422
8,17156	16,65685	13,82842	16,65685
0,08579	0,08579	5,25734	5,25734
5,25734	13,74263	0,08579	2,91422
5,34313	13,82842	5,34313	8,17156
0,912305	1,221592	1,140772	1,221592
0,727795	1,140772	0,727795	0,912305
0,184510	0,080820	0,412977	0,309287
0,092255	0,040410	0,206489	0,154644

5,05665	6,22238	5,05665	5,48878
5,48878	6,54499	6,22238	6,54499
0,703863	0,793957	0,703863	0,739475
0,739475	0,815909	0,793957	0,815909
0,964388 −1	0,978048 −1	0,909906 −1	0,923566 −1
92255	40410	206489	154644
0,056643	0,018458	0,116395	0,078210
0,753146 −2	0,266185 −2	0,065935 −1	0,893262 −2
637784 −1	637784 −1	637784 −1	637784 −1
0,115362 −1	0,628401 −2	0,428151 −1	0,255478 −1
0,130425	0,042501	0,268010	0,180089
362216			

$4d_2 + 12d_6 = 3{,}37440$

$4d_2 - 4d_6 = 3{,}39008$

$16d_6 = -0{,}01568$
144
128

$0{,}84752$
98
$0{,}84850$

$0{,}466709$
$0{,}933418 - 2$

$d_2 + 2d_4 + 3d_6 = 0{,}80010$

$2d_4 =$

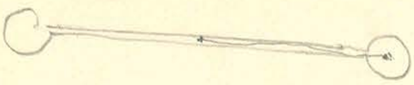
$-0{,}04840$
294
$-0{,}04546$
~~$0{,}04546$~~
~~$0{,}04546$~~
~~$d_6 = \ldots$~~

$d_6 = 0{,}000980$

$d_2 = 0{,}84850$

$d_4 = -0{,}02273$

7



$$y^2 = r^2 - x^2$$

$$\sigma \int (\lambda+x)^2 (\pi y^2)\left(\alpha \frac{l+x}{a} + \beta \frac{(l+x)^2}{a^2}\right) \qquad \frac{\alpha}{a} = \alpha' \quad \frac{\beta}{a^2} = \beta'$$

$$\pi\sigma \int (\lambda+x)^2(r^2-x^2)(\alpha'(\lambda+x)+\beta'(\lambda+x)^2)\,dx$$

$$\pi\sigma\int (\lambda^2 r^2 + 2x\lambda r^2 + x^2 r^2 - \lambda^2 x^2 - 2\lambda x^3 - x^4)(\alpha'\lambda + \alpha' x + \beta'\lambda^2 + 2\beta'\lambda x + \beta' x^2)$$

$$(\alpha'\lambda+\beta'\lambda^2 + (\alpha'+2\beta'\lambda)x + \beta' x^2)$$

$$(\lambda^2 r^2 + 2\lambda r^2 x + (r^2-\lambda^2)x^2 - 2\lambda x^3 - x^4)(\alpha'\lambda+\beta'\lambda^2+(\alpha'+2\beta'\lambda)x+\beta'x^2)$$

$$(\lambda^2r^2(\alpha'\lambda+\beta'\lambda^2)) + (2\lambda r^2(\alpha'\lambda+\beta'\lambda^2) + \lambda^2 r^2(\alpha'+2\beta'\lambda))x$$

$$+ \left[2\lambda r^2(\alpha'+2\beta'\lambda) + \beta'\lambda^2 r^2 + (r^2-\lambda^2)(\alpha'\lambda+\beta'\lambda^2)\right]x^2$$

$$+ \left[-2\lambda(\alpha'\lambda+\beta'\lambda^2) + (r^2-\lambda^2)(\alpha'+2\beta'\lambda) + 2\lambda r^2\beta'\right]x^3$$

$$+\left[-(\alpha'\lambda+\beta'\lambda^2) - 2\lambda(\alpha'+2\beta'\lambda) + (r^2-\lambda^2)\beta'\right]x^4$$

$$+\left[-(\alpha'+2\beta'\lambda) - 2\beta'\lambda\right]x^5$$

$$+\left[-\beta'\right]x^6$$

$\frac{x^2}{2}$ $\frac{x^3}{3}$ $\frac{2}{3}r^3$

$$\pi\sigma\int\left\{2(\lambda^2r^2(\alpha'\lambda+\beta'\lambda^2)r + \frac{2}{3}(2)r^3 + \frac{2}{5}(4)r^5 - \frac{2}{7}\beta' r^7\right\} \qquad \alpha'\lambda+\beta'\lambda^2 = \mu_0$$

$$\pi\sigma\int\left\{2\lambda^2r^3(\alpha'\lambda+\beta'\lambda^2)\right.$$

$$\pi\sigma\int\Big(2\lambda^2r^3\mu_0 + \frac{2}{3}\big(2r^2\mu_0 + 2\lambda^2\beta' r^2 + \beta'\lambda^2r^2 + (r^2-\lambda^2)\mu_0\big)r^3$$

$$+\frac{2}{5}\big(-\mu_0 - 2\mu_0 - 2\beta'\lambda^2 + (r^2-\lambda^2)\beta'\big)r^5$$

$$-\frac{2}{7}\beta' r^7$$

$$\pi\sigma\Big[\frac{4}{3}\lambda^2r^3\mu_0 + \Big(\frac{4}{3}\mu_0 + \frac{4}{3}\lambda^2\beta' + \frac{2}{3}\lambda^2\beta' + \frac{2}{3}\mu_0 - \frac{6}{5}\mu_0 - \frac{4}{5}\beta'\lambda^2 - \frac{2}{5}\beta'\lambda^2\Big)r^5$$

$$+\left(\frac{2}{5}\beta' - \frac{2}{7}\beta'\right)r^7$$

$$\pi\sigma\left[\frac{4}{3}\lambda^2r^3\mu_0 + \left(\frac{4}{5}\mu_0+\frac{4}{5}\beta'\lambda^2\right)r^5 + \frac{4}{35}\beta' r^7\right]$$

$$fm\lambda^2\mu_0\left(1+\frac{\left(\frac45\mu_0+\frac45\beta'\lambda^2\right)}{\frac43\lambda^2r^3\mu_0}r^5 + \frac{3}{35}\frac{\beta'}{\lambda^2r^3\mu_0}r^7\right] = fm\lambda^2\mu_0\left(1+\frac35\frac{\mu_0+\beta'\lambda^2}{\lambda^2\mu_0}r^2 + \frac{3}{35}\frac{\beta'}{\lambda^2\mu_0}r^4\right)$$

$\kappa = \frac{1}{K}$ $\quad$ $\underline{\underline{b = 1 \text{ re.}}}$ $\quad$ $l = 1$ re.

$$F = \frac{4 f \sigma}{\sqrt{2}} l^2 \omega \Big[\Big|_{0}^{l(1+k)}{}_{l(1-k)} + \Big|_{0}^{l(1+k)}{}_{l(1+k)} - \Big|_{0}^{l(1-k)}{}_{l(1-k)} - \Big|_{0}^{l(1-k)}{}_{l(1+k)}$$

1) $\quad$ 2)

$$+ (1-\cancel{2}k)\Big\{ \Big\|_{0}^{l(1+k)}{}_{l(1-k)} - \Big\|_{0}^{l(1-k)}{}_{l(1-k)} \Big\} + (1+\cancel{2}k)\Big\{ \Big\|_{0}^{l(1+k)}{}_{l(1+k)} - \Big\|_{0}^{l(1-k)}{}_{l(1+k)} \Big]$$

$$+ c \Big\{ \Big|\Big|\Big|_{0}^{l(1+k)}{}_{l(1-k)} - \Big|\Big|\Big|_{0}^{l(1-k)}{}_{l(1-k)} \Big\} + c \Big\{ \Big|\Big|\Big|_{0}^{l(1+k)}{}_{l(1+k)} - \Big|\Big|\Big|_{0}^{l(1-k)}{}_{l(1+k)} \Big\}$$

3) $\quad$ 4)

$$\Big|_{0}^{l(1+k)}{}_{l(1-k)} = 0{,}128977 \qquad \Big|_{0}^{l(1-k)}{}_{l(1-k)} = 0{,}774899$$

$$\Big|_{0}^{l(1+k)}{}_{l(1+k)} = 0{,}567858 \qquad \Big|_{0}^{l(1-k)}{}_{l(1+k)} = 1{,}347607.$$

<u>négy pontos</u> $(\|-\|)_1 = 1{,}291\cancel{600}$ 583 $\qquad (\|-\|)_2 = 0{,}231925$

$(|||-|||)_3 = 0{,}03224\cancel{48}$ 25 $\qquad (|||-|||)_4 = \cancel{0{,}161112}$ 0,156508

jó → $-0{,}7221132$ $\qquad$ ~~F ...~~

~~$F = 4 f \sigma l^2\, 0{,}7156034\, \varphi$~~

$\boxed{F = 4 f \sigma l^2\, 0{,}\cancel{722}1132\, \varphi \text{ új négy korrektúrás}}$

Fourier formula 45 fok és 0 fok körüli új kiegyenlítés és 45°-os potenciálkiegyenlítés.

$$\cancel{V_{45}} \ldots V_0 = \quad -V_0 = \frac{\alpha_4}{4} + \frac{\alpha_8}{8} + \frac{\alpha_{12}}{12}$$

$$-V_{45} = -\frac{\alpha_4}{4} + \frac{\alpha_8}{8} - \frac{\alpha_{12}}{12}$$

$$V_{45} - V_0 = \frac{\alpha_4}{2} + \frac{\alpha_{12}}{6} = 0{,}083394.$$

$$\left(\frac{\partial F}{\partial \varphi}\right)_0 = 4\alpha_4 + 8\alpha_8 + 12\alpha_{12} = 0{,}624405$$

$$\left(\frac{\partial F}{\partial \varphi}\right)_{45} = -4\alpha_4 + 8\alpha_8 - 12\alpha_{12} = -0{,}\cancel{715600}\,722113 \quad \text{értékül.}$$

$$F = 4 f \sigma l^2 \{ 0{,}165972 \sin 4\vartheta - 0{,}006106 \sin 8\vartheta + 0{,}000572 \sin 12\vartheta \}$$

értékül $\vartheta = 22^0\tfrac{1}{2}$-re $F = 0{,}166025$ míg a régi 0,165997

Fourier formula 0 és 45 közötti egyezőség, hogyha polarizált 45°, forgás maximum 22½

$$\frac{1}{4}\,\frac{\partial F}{\partial \varphi_0} = \alpha_4 + 2\alpha_8 + 3\alpha_{12} + 4\alpha_{16}$$

$$\frac{1}{4}\left(\frac{\partial F}{\partial \varphi}\right)_{45} = -\alpha_4 + 2\alpha_8 - 3\alpha_{12} + 4\alpha_{16}$$

$$V_{45} - V_0 = \frac{\alpha_2}{2} + \frac{\alpha_{12}}{6} = 0{,}083394$$

$$F_{22\frac{1}{2}} = \alpha_4 - \alpha_{12}$$

Horizontális erő hatása Nov. 25 58

Mechanikai megfontolásból.

longitudinális $$H_l = -2f\sigma m l^2 D\left(\frac{\partial \overset{b}{\mathrm{III}}{}^{a+l}_{c}}{\partial b} + \frac{\partial \overset{b}{\mathrm{III}}{}^{a-l}_{c}}{\partial b}\right) + 2f\sigma m \frac{l^2 D}{l}\left(\mathrm{III}^{a+l}_{\,b\,c} - \mathrm{III}^{a-l}_{\,b\,c}\right)$$

transversalis $$H_t = -2f\sigma m l^2 D\left(\frac{\partial \overset{a}{\mathrm{III}}{}^{b+l}_{c}}{\partial a} + \frac{\partial \overset{a}{\mathrm{III}}{}^{b-l}_{c}}{\partial a}\right) + 2f\sigma m \frac{l^2 D}{l}\left(\mathrm{III}^{b+l}_{\,a\,c} - \mathrm{III}^{b-l}_{\,a\,c}\right)$$

$$\mathrm{III}^{x}_{y\,z} = \log \frac{\sqrt{x^2+z^2}\left(y+\sqrt{y^2+z^2}\right)}{z\left(y+\sqrt{x^2+y^2+z^2}\right)}$$

$$\frac{\partial \mathrm{III}^{x}_{y\,z}}{\partial x} = \frac{xy}{S(x^2+z^2)}, \quad S = \sqrt{x^2+y^2+z^2}$$

$$\left(\frac{\partial \overset{b}{\mathrm{III}}{}^{a+l}_{c}}{\partial b} + \frac{\partial \overset{b}{\mathrm{III}}{}^{a-l}_{c}}{\partial b}\right) = \frac{b}{b^2+c^2}\left(\frac{a+l}{\sqrt{(a+l)^2+b^2+c^2}} + \frac{a-l}{\sqrt{(a-l)^2+b^2+c^2}}\right)$$

$$\mathrm{III}^{a+l}_{\,b\,c} - \mathrm{III}^{a-l}_{\,b\,c} = \log \frac{\sqrt{(a+l)^2+c^2}}{\sqrt{(a-l)^2+c^2}} \cdot \frac{b+\sqrt{(a-l)^2+b^2+c^2}}{b+\sqrt{(a+l)^2+b^2+c^2}} \;+)$$

$$\left(\frac{\partial \overset{a}{\mathrm{III}}{}^{b+l}_{c}}{\partial a} + \frac{\partial \overset{a}{\mathrm{III}}{}^{b-l}_{c}}{\partial a}\right) = \frac{a}{a^2+c^2}\left(\frac{b+l}{\sqrt{a^2+(b+l)^2+c^2}} + \frac{b-l}{\sqrt{a^2+(b-l)^2+c^2}}\right)$$

$$\mathrm{III}^{b+l}_{\,a\,c} - \mathrm{III}^{b-l}_{\,a\,c} = \log \frac{\sqrt{(b+l)^2+c^2}}{\sqrt{(b-l)^2+c^2}} \cdot \frac{a+\sqrt{(b-l)^2+a^2+c^2}}{a+\sqrt{(b+l)^2+a^2+c^2}} \;+)$$

$a=3 \quad b=1$

		$\frac{H_l}{2f\sigma m l^2 D}$	$\frac{H_t}{2f\sigma m l^2 D}$	$H_t - H_l$
$c=2$	$l=0$	$-0{,}197362$	$+0{,}197362$	$0{,}394724$
	$l=1$	$-0{,}183119$	$+0{,}159202$	$0{,}342321$
$c=3$	$l=0$			
	$l=1$		$+0{,}052856$	
$c=2{,}5$	$l=1$		$+0{,}090151$	

ha l végtelen kicsiny akkor $\frac{1}{l}\left(\mathrm{III}^{a+l}_{\,b\,c} - \mathrm{III}^{a-l}_{\,b\,c}\right) = \frac{2ab}{(a^2+c^2)\sqrt{a^2+b^2+c^2}}$ és $\frac{1}{l}\left(\mathrm{III}^{b+l}_{\,a\,c} - \mathrm{III}^{b-l}_{\,a\,c}\right) = \frac{2ab}{(b^2+c^2)\sqrt{a^2+b^2+c^2}}$

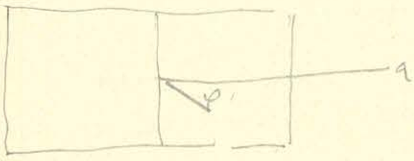
ennek ha l végtelen $H_l = 4f\sigma m l^2 D\left(-\frac{ab}{(b^2+c^2)\sqrt{a^2+b^2+c^2}} + \frac{ab}{(a^2+c^2)\sqrt{a^2+b^2+c^2}}\right)$

$a = 3 \quad b = 1 \quad c = 0.$

	$\frac{M_l}{2\pi\sigma m l^2 D}$	$\frac{M_t}{2\pi\sigma m l^2 D}$	$\frac{M_t}{2\pi\sigma m} - \frac{M_l}{2\pi\sigma m}$
$l = 0$	$-1{,}686547$	$+1{,}686547$	$3{,}373094$
$l = \frac{1}{2}$	$-1{,}673856$	$+1{,}892411$	$3{,}566267.$
$l = 0{,}8$	$-1{,}645722$	$+2{,}448984$	$4{,}094716.$
$l = 1$		∞	∞

Horizontális lemez forgási momentuma.

1 lemez.



$$F = -D\varrho\sigma l\cos\varphi\left\{\left(\iiint\Big|^{b+l\sin\varphi}_{a-l\cos\varphi,\;c} - \iiint\Big|^{b-l\sin\varphi}_{a+l\cos\varphi,\;c}\right) + \left(\iiint\Big|^{b+l\sin\varphi}_{a+l\cos\varphi,\;c} - \iiint\Big|^{b-l\sin\varphi}_{a+l\cos\varphi,\;c}\right)\right\}$$

$$+ D\varrho\sigma l\sin\varphi\left\{\left(\iiint\Big|^{a+l\cos\varphi}_{b-l\sin\varphi,\;c} - \iiint\Big|^{a-l\cos\varphi}_{b-l\sin\varphi,\;c}\right) + \left(\iiint\Big|^{a+l\cos\varphi}_{b+l\sin\varphi,\;c} - \iiint\Big|^{a+l\cos\varphi}_{b+l\sin\varphi,\;c}\right)\right\}$$

$a = 3 \qquad b = 1 \qquad \underline{\underline{c = 2}} \qquad l = 1$ cm.

---

1) $\varphi = 22\tfrac{1}{2}^\circ \quad \frac{1}{D\varrho\sigma l^2} F_{22\frac12} = -0{,}1269229 = -\left(\frac{1}{\sqrt2}d_2 + d_4 + \frac{1}{\sqrt2}d_6 + 0 - \frac{1}{\sqrt2}d_{10}\right)$

$\varphi = 45^\circ \quad \frac{1}{D\varrho\sigma l^2} F_{45} = -0{,}1708675 = -\left(d_2 - d_6 + d_{10}\right)$

2) $\varphi = 67\tfrac{1}{2}^\circ \quad \frac{1}{D\varrho\sigma l^2} F_{67\frac12} = -0{,}1149360 = -\left(\frac{1}{\sqrt2}d_2 - d_4 + \frac{1}{\sqrt2}d_6 + 0 - \frac{1}{\sqrt2}d_{10}\right)$

3) kezd. $\frac{1}{D\varrho\sigma l^2}\left(\frac{\partial F}{\partial\varphi}\right)_0 = -0{,}366238 = -\left(2d_2 + 4d_4 + 6d_6 + 8d_8 + 10d_{10}\right)$

4) harm. $\frac{1}{D\varrho\sigma l^2}\left(\frac{\partial F}{\partial\varphi}\right)_{\frac{\pi}{2}} = +0{,}318408 = -\left(-2d_2 + 4d_4 - 6d_6 + 8d_8 - 10d_{10}\right)$

$$F = -D\varrho\sigma l^2\big(0{,}1709428\sin 2\vartheta + 0{,}00599345\sin 4\vartheta + 0{,}000074775\sin 6\vartheta$$
$$- 0{,}00000701\sin 8\vartheta - 0{,}00001502\sin 10\vartheta\big)$$

Négyes formula. 1) 2) 3) és 4 ből

$$F = -D\varrho\sigma l^2\big(0{,}1709499\sin 2\vartheta + 0{,}00599345\sin 4\vartheta + 0{,}0000702\sin 6\vartheta$$
$$- 0{,}00000701\sin 8\vartheta\big)$$

ennél $F_{45} = -D\varrho\sigma l^2\, 0{,}1708797$ látszik a felső 5ös formula nagyon jó.

---

verticalis irány mellett

$\not b$ ha $\underline{a = b} = 14{,}925$ $\quad c = 29{,}25$ $\quad l = 12{,}986$

akkor $\not b$ szerint.

longitudinalis $\quad \dfrac{A+B}{2} = -\delta l^2 \varphi\, \underline{\cancel{0{,}1604186}}$ egyebb számításból $0{,}151680$

transversalis $\quad \dfrac{AB}{2} = +\delta l^2 \varphi\; 0{,}\cancel{0629}485$ egyebben $0{,}0912228$

Quadratikus vs. logs.

$a = b = 14{,}925 \quad l = 6{,}5 \quad c = 29{,}25$

$a - l = 8{,}425 \quad a + l = 21{,}425$

$a^2 = b^2 = 222{,}75 \quad c^2 = 855{,}567 \quad (a-l)^2 = 70{,}9807$

$(a+l)^2 = 459{,}037$

$I_c^{b-l\,a} = 0{,}453228$

$I_c^{b+l\,a} = 0{,}819621$

$I_c^{b\,a+l} = 0{,}479258$

$I_c^{b\,a-l} = 0{,}991439$

$II_c^{b\,a+l} - II_c^{b\,a-l} = 0{,}340711$

$III_c^{b\,a+l} - III_c^{b\,a-l} = 0{,}056956$

$\log a = 1{,}173914 \qquad \log a^2 = 2{,}347828$

$\log c = 1{,}466126 \qquad \log c^2 = 2{,}932252$

$\log(a-l) = 0{,}925570 \qquad \log(a-l)^2 = 1{,}851140$

$\log(a+l) = 1{,}330924 \qquad \log(a+l)^2 = 2{,}661848$

~~log l = 1,119475~~ $\qquad$ ~~log l² = 2,238950~~

$\log l = 0{,}812913 \qquad \log l^2$

v log

$\log\sqrt{a^2+(a-l)^2+c^2} = 1{,}530215 \qquad 33{,}9012 = \sqrt{a^2+(a-l)^2+c^2} = \sqrt{1149{,}29}$

$\log\sqrt{a^2+(a+l)^2+c^2} = 1{,}593387 \qquad 39{,}2099 = \sqrt{a^2+(a+l)^2+c^2} = \sqrt{1537{,}35}$

$\log\sqrt{(a+l)^2+a^2} = 1{,}416825 \qquad 26{,}1111 = \sqrt{(a+l)^2+a^2} = \sqrt{681{,}787}$

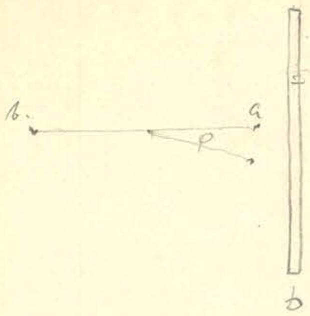
$\log\sqrt{(a-l)^2+a^2} = 1{,}233975 \qquad 17{,}1386 = \sqrt{(a-l)^2+a^2} = \sqrt{293{,}731}$

$\log\sqrt{(a+l)^2+c^2} = 1{,}559397 \qquad 36{,}2574 = \sqrt{(a+l)^2+c^2} = \sqrt{1314{,}60}$

$\log\sqrt{(a-l)^2+c^2} = 1{,}483433 \qquad 30{,}4092 = \sqrt{(a-l)^2+c^2} = \sqrt{926{,}544}$

forg. momentum $+4\rho\delta l^2 w \cdot 0{,}52771\ \delta\vartheta\varphi$

longitudinalis ... lemez hatása



$$a \text{ pontra forgási momentum} = -2\vartheta l^2\varphi \frac{\partial \mathrm{II}_c^{b\,a-l}}{\partial b} - 2\vartheta l\varphi\, \mathrm{I}_c^{b\,a-l} = A$$

$$b \text{ pontra forgási momentum} = +2\vartheta l^2\varphi \frac{\partial \mathrm{II}_c^{b\,a+l}}{\partial b} + 2\vartheta l\varphi\, \mathrm{I}_c^{b\,a+l} = B.$$

c mint $\frac{\cancel{A+B}}{2} = \cancel{\ }$

... a rúdhoz ... tömegpontok.

$$\frac{A+B}{2} = -\vartheta l^2\varphi\left[\frac{\partial \mathrm{II}_c^{b\,a-l}}{\partial b} + \frac{\partial \mathrm{II}_c^{b\,a+l}}{\partial b} + \frac{1}{l}\mathrm{I}_c^{b\,a-l} - \frac{1}{l}\mathrm{I}_c^{b\,a+l}\right]$$ jó 10/9 '91

transversalis

~~a pontra forgási momentum~~

$$a\text{-ra momentum} = -\vartheta l\left[\mathrm{I}_c^{a\,b-l} + \mathrm{I}_c^{a\,b+l}\right] - \frac{\partial\left(\mathrm{I}_c^{a\,b-l} + \mathrm{I}_c^{a\,b+l}\right)}{\partial a}\vartheta l^2\varphi + \vartheta l\varphi\left[\mathrm{II}_c^{a\,b+l} - \mathrm{II}_c^{a\,b-l}\right]$$

$$b\text{-re} \quad \ldots = +\vartheta l\left[\mathrm{I}_c^{a\,b-l} + \mathrm{I}_c^{a\,b+l}\right] + \frac{\partial\left(\mathrm{I}_c^{a\,b-l} + \mathrm{I}_c^{a\,b+l}\right)}{\partial a}\vartheta l^2\varphi + \vartheta l\varphi\left[\mathrm{II}_c^{a\,b+l} - \mathrm{II}_c^{a\,b-l}\right]$$

c mint

$$\frac{A+B}{2} = -\vartheta l^2\varphi\left[\frac{\partial\left(\mathrm{I}_c^{a\,b-l} + \mathrm{I}_c^{a\,b+l}\right)}{\partial a} - \frac{1}{l}\left(\mathrm{II}_c^{a\,b+l} - \mathrm{II}_c^{a\,b-l}\right)\right]$$ jó 10/9 '91

$$\frac{\partial \mathrm{I}_c^{a\,l}}{\partial a} = -\frac{bc}{a^2S^2+b^2c^2}\left(S+\frac{a^2}{S}\right) \qquad S = \sqrt{a^2+b^2+c^2}$$

c mint

$$\boxed{\frac{\partial}{\partial a}\left(\mathrm{I}_c^{a\,b-l} + \mathrm{I}_c^{a\,b+l}\right) = -c\left[\left(S+\frac{a^2}{S}\right)\left(\frac{b-l}{a^2S^2+(b-l)^2c^2}\right) + \left(\frac{b+l}{a^2S'^2+(b+l)^2c^2}\right)\left(S'+\frac{a^2}{S'}\right)\right] \quad S^2 = a^2+(b-l)^2+c^2 \quad S'^2 = a^2+(b+l)^2+c^2}$$

$$\cancel{\frac{\partial \mathrm{II}_c^{a}}{\partial b} = \frac{b}{a^2+b^2} - \frac{b}{\sqrt{b^2+c^2}\left(c+\sqrt{b^2+c^2}\right)} + \frac{1}{b} - \frac{b}{S(c+S)}}$$

$$\cancel{\frac{\partial \mathrm{II}_c^{b\,a-l}}{\partial b} + \frac{\partial \mathrm{II}_c^{b\,a+l}}{\partial b} = b\left(\frac{1}{(a-l)^2+b^2} + \frac{1}{(a+l)^2+b^2} - \frac{1}{S(c+S)} - \frac{1}{S'(c+S')}\right) + \frac{2b}{\sqrt{b^2+c^2}\left(c+\sqrt{b^2+c^2}\right)} - \frac{2}{b}}$$

$$\cancel{S^2 = (a-l)^2+b^2+c^2 \qquad S'^2 = (a+l)^2+b^2+c^2}$$

$$\frac{\partial}{\partial b}\mathrm{II}_c^{a\,b} = \frac{b}{a^2+b^2} - \frac{b}{S(c+S)} = \frac{bc}{S(a^2+b^2)}$$

$$\frac{\partial}{\partial b}\left(\mathrm{II}_c^{b\,a-l} + \mathrm{II}_c^{b\,a+l}\right) = bc\left(\frac{1}{S\left((a-l)^2+b^2\right)} + \frac{1}{S'\left((a+l)^2+b^2\right)}\right)$$

A négy hiányzót kifejező formula [illegible] Decemb 2.

$$-P\varphi + Q\varphi^3 = A_2 \sin 2\varphi + A_4 \sin 4\varphi + A_6 \sin 6\varphi + A_8 \sin 8\varphi$$

$$P'\varphi - Q'\varphi^3 = -A_2 \sin 2\varphi + A_4 \sin 4\varphi - A_6 \sin 6\varphi + A_8 \sin 8\varphi$$

$$(P'-P)\varphi - (Q'-Q)\varphi^3 = 2A_4 \sin 4\varphi + 2A_8 \sin 8\varphi$$

$$-(P'+P)\varphi + (Q'+Q)\varphi^3 = 2A_2 \sin 2\varphi + 2A_6 \sin 6\varphi$$

$$P'-P = 8A_4 + 16A_8$$

$$+(Q'-Q) = \frac{2}{6}\,64\,A_4 + \frac{2}{6}\,512\,A_8$$

$$-(P'+P) = 4A_2 + 12A_6$$

$$-(Q'+Q) = \frac{2}{6}\,8A_2 + \frac{2}{6}\,216\,A_6.$$

[illegible] $Y l\cos\varphi - X l \sin\varphi = -4/\sigma l^2 (\overset{P}{1{,}600203}\,\varphi - \overset{Q}{\cancel{0{,}8443504}}\ \varphi^3)$ $0{,}85846$

[illegible] $Y l\cos\varphi - X l \sin\varphi = +4/\sigma l^2 (\overset{P'}{1{,}774195}\,\varphi - \overset{Q'}{\cancel{1{,}229218}}\ \varphi^3)$ $1{,}32805$

$$\left.\begin{aligned} P'-P &= 0{,}173992 = 8A_4 + 16A_8 \\ Q'-Q &= \overset{0{,}46959}{\cancel{0{,}384868}} = \frac{64}{3}A_4 + \frac{512}{3}A_8 \end{aligned}\right\}\quad \begin{aligned} A_4 &= \cancel{+0{,}0226701}\ \cancel{+0{,}021701} + 0{,}021661 \\ A_8 &= -\cancel{0{,}0009205} = +0{,}0000438 \end{aligned}$$

$$\left.\begin{aligned} -(P'+P) &= -3{,}374298 = 4A_2 + 12A_6 \\ -(Q'+Q) &= \overset{-2{,}18657}{\cancel{2{,}133568}} = \frac{8}{3}A_2 + 72A_6 \end{aligned}\right\}\quad \begin{aligned} A_2 &= -\cancel{0{,}849058}\ \cancel{+0{,}0027}01 = -0{,}846556 \\ A_6 &= +\cancel{0{,}0018128}\ \cancel{+0{,}00082}95 = 0{,}0009854 \end{aligned}$$

[illegible][+] $F_{45} = \cancel{-4/\sigma(0{,}849028)} = 0{,}847540$ [illegible] !!!
$0{,}8475\,25$ [illegible]
[illegible] $\overline{98}$

[illegible] $-4/\sigma\,(0{,}84752$ [illegible][+]) $F_{22\frac{1}{2}} = 0{,}576249$
$0{,}5762\,45$ [illegible]

$F_{67\frac{1}{2}} = 0{,}619571$ [illegible].
$0{,}6195\,69$ [illegible]

[illegible] $\overline{98}$ [illegible]

+) $F = -4/\sigma l^2 (0{,}846556 \sin 2\varphi - 0{,}021661 \sin 4\varphi - 0{,}0009854 \sin 6\varphi - 0{,}0000438 \sin 8\varphi)$

[illegible]

$$F = -4\pi\sigma l^2\left(\alpha_{20}(1+k_1\lambda^2+k_2\lambda^4)\sin 2\vartheta + (\alpha'_{4}\lambda^2+\alpha''_{4}\lambda^4)\sin 4\vartheta + \alpha_6\lambda^4\sin 6\vartheta + \alpha_8\lambda^6\sin 8\vartheta\right)$$

[illegible] longitudinális és transzverzális [illegible]

$$\frac{\left(\frac{\partial F}{\partial\varphi}\right)_{\frac{\pi}{2}} - \left(\frac{\partial F}{\partial\varphi}\right)_0}{4\pi\sigma l^2} = 4\alpha_{20}(1+k_1\lambda^2+k_2\lambda^4) + 12\alpha_6\lambda^4$$

$$\frac{\left(\frac{\partial F}{\partial\varphi}\right)_{\frac{\pi}{2}} + \left(\frac{\partial F}{\partial\varphi}\right)_0}{4\pi\sigma l^2} = -8(\alpha'_4\lambda^2+\alpha''_4\lambda^4) - 16\alpha_8\lambda^6$$

[illegible] $\cancel{\left(\frac{\partial F}{\partial\varphi}\right)_{\frac{\pi}{2}}}$

	$\left(\frac{\partial F}{\partial\varphi}\right)_0$	$\left(\frac{\partial F}{\partial\varphi}\right)_{\frac{\pi}{2}}$	Differencia	Summa
$\lambda = 0$ -ra	−1,673752	+1,673752	3,347504	0,000000
$\lambda = 0{,}5$ -re	−1,656543	+1,700360	3,356903	+0,043817
$\lambda = 1$ -re	−1,600203	+1,774195	3,374398	+0,173992

[illegible]

$$F = -4\pi\sigma l^2\{0{,}836876(1+0{,}012297\lambda^2-0{,}0007303\lambda^4)\sin 2\vartheta - (0{,}021925\lambda^2-0{,}0000885\lambda^4)\sin 4\vartheta - 0{,}0009854\lambda^4\sin 6\vartheta - 0{,}0000438\lambda^6\sin 8\vartheta\}$$

[illegible] $\mu_l = -1{,}627927$ $\mu_t = 1{,}740076$ $\mu_l - \mu_t = 3{,}368004$

$1{,}628309$ $1{,}739551$ [illegible] $3{,}267860$

Ψ

$$Yl\cos\varphi = -4f\sigma l^2\left\{\Big|_c^b a-l + \Big|_c^b a+l\right\}\varphi + 4f\sigma l^2\left\{\frac{2}{3}\Big|_c^b a-l + \frac{2}{3}\Big|_c^b a+l - \frac{lbc}{2}\left[\frac{1}{\varsigma_1((a-l)^2+b^2)} - \frac{1}{\varsigma_2((a+l)^2+b^2)}\right]\right.$$

$$\left. - \frac{l^2}{6}\frac{(a-l)bc}{(b^2\varsigma_1^2+(a-l)^2c^2)\varsigma_1}\left[-3+2\frac{(b^2+\varsigma_1^2)^2}{b^2\varsigma_1^2+(a-l)^2c^2}+\frac{b^2}{\varsigma_1^2}\right] - \frac{l^2}{6}\frac{(a+l)bc}{(b^2\varsigma_2^2+(a+l)^2c^2)\varsigma_2}\left[-3+2\frac{(b^2+\varsigma_2^2)^2}{b^2\varsigma_2^2+(a+l)^2c^2}+\frac{b^2}{\varsigma_2^2}\right]\right\}\varphi^3$$

$$Xl\sin\varphi = -4f\sigma l\left\{(a+l)\Big|^{a+l}_{\substack{b\\c}} - (a-l)\Big|^{a-l}_{\substack{b\\c}} + b\left\{\Big\|^{a+l}_{\substack{b\\c}} - \Big\|^{a-l}_{\substack{b\\c}}\right\} + c\left\{\Big|\!\Big|\!\Big|^{a+l}_{\substack{b\\c}} - \Big|\!\Big|\!\Big|^{a-l}_{\substack{b\\c}}\right\}\right\}\varphi$$

$$+4f\sigma l^2\left\{\frac{1}{6}\left[(a+l)\Big|^{a+l}_{\substack{b\\c}} - (a-l)\Big|^{a-l}_{\substack{b\\c}} + b\left\{\Big\|^{a+l}_{\substack{b\\c}} - \Big\|^{a-l}_{\substack{b\\c}}\right\} + c\left\{\Big|\!\Big|\!\Big|^{a+l}_{\substack{b\\c}} - \Big|\!\Big|\!\Big|^{a-l}_{\substack{b\\c}}\right\}\right] + \right.$$

$$\left. + \frac{1}{2}\Big|^{a+l}_{\substack{b\\c}} + \frac{1}{2}\Big|^{a-l}_{\substack{b\\c}} + \frac{1}{2}bcl\left(\frac{1}{\varsigma_1((a-l)^2+b^2)} - \frac{1}{\varsigma_2((a+l)^2+b^2)}\right)\right\}\varphi^3$$

$$\varsigma_1^2 = (a-l)^2+b^2+c^2$$
$$\varsigma_2^2 = (a+l)^2+b^2+c^2$$

E szerint $a = 3$ $b = 1$ $c = 2$ $l = 1$ re.

longitud. $Yl\cos\varphi - Xl\sin\varphi = -4f\sigma l^2\left(1{,}600203\varphi - \overset{0{,}85846}{\cancel{0{,}89495}}\varphi^3\right)$

transversalis $Yl\cos\varphi - Xl\sin\varphi = +4f\sigma l^2\left(1{,}774195\varphi - \overset{1{,}32805\varphi^3}{\cancel{1{,}239218\varphi^3}}\ \cancel{1{,}303729\varphi^3}\right)$

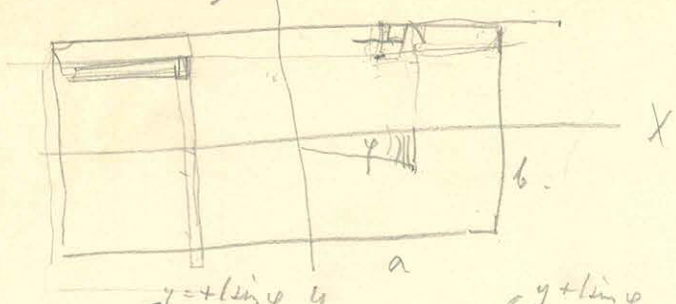
Quadratikus oszlopra $a = 1$ $b = 1$ $c = 2$ $l = 1$ re.

$Yl\cos\varphi - Xl\sin\varphi = +4f\sigma l^2\left(0{,}624408\varphi - \overset{1{,}393217}{\cancel{1{,}139516}}\varphi^3\right)$

~~ebből $A\sin 4\varphi + A_2\sin 8\varphi = +4f\sigma l^2(0{,}166151\sin 4\varphi - 0{,}01601\sin 8\varphi)$~~

amiből kitérés from $+4f\sigma l^2(0{,}1645963\sin 4\vartheta - 0{,}0042475\sin 8\vartheta)$

négyes hiány φ-vel [illegible] 58 Decemb 2. 1)



$$-\frac{Y}{f\sigma} = 2\int_{y=-l\sin\varphi}^{y=+l\sin\varphi} dy \Big|_c^{b+y}{}_{a-l\cos\varphi} + 2\int_{y=-l\sin\varphi}^{y+l\sin\varphi} dy \Big|_c^{b+y}{}_{a+l\cos\varphi} = 2\int_{y=-l\sin\varphi}^{y=+l\sin\varphi} dy \Big|_c^{b+y}{}_{a-l+\frac{1}{2}\frac{y^2}{l}} + 2\int_{y=-l\sin\varphi}^{y=+l\sin\varphi} dy \Big|_c^{b+y}{}_{a+l-\frac{1}{2}\frac{y^2}{l}}$$

$$-\frac{X}{f\sigma} = 2\int_{x=-l\cos\varphi}^{x=+l\cos\varphi} dx \Big|_c^{a+x}{}_{b-l\sin\varphi} + 2\int_{x=-l\cos\varphi}^{x=+l\cos\varphi} dx \Big|_c^{a+x}{}_{b+l\sin\varphi}$$

Kész Dec. 24.

$$f(x+h, y+k) = f(x\,y) + h\frac{\partial f}{\partial x} + k\frac{\partial f}{\partial y} + \frac{1}{2}h^2\frac{\partial^2 f}{\partial x^2}$$

$$\Big|_c^a{}_b = \operatorname{arctg}\frac{bc}{a\sqrt{a^2+b^2+c^2}} \qquad \varsigma = \sqrt{a^2+b^2+c^2}$$

$$\frac{\partial}{\partial a}\Big|_c^a{}_b = -\frac{bc}{a^2\varsigma^2+b^2c^2}\,\frac{\varsigma^2+a^2}{\varsigma}$$

$$\frac{\partial^2}{\partial a^2}\Big|_c^a{}_b = -\frac{abc}{(a^2\varsigma^2+b^2c^2)\varsigma}\left\{3-\frac{a^2}{\varsigma^2}-2\frac{(\varsigma^2+a^2)^2}{(a^2\varsigma^2+b^2c^2)}\right\}$$

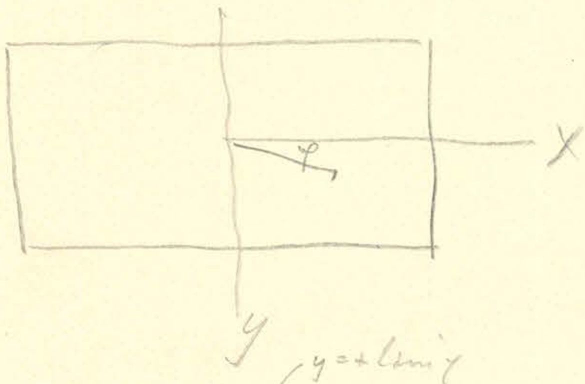
$$\frac{\partial}{\partial b}\Big|_c^a{}_b = +\frac{ac}{a^2\varsigma^2+b^2c^2}\,\frac{\varsigma^2-b^2}{\varsigma} = \frac{ac}{\varsigma(a^2+b^2)} \quad +)$$

$$\Big|_c^{b+y}{}_{a-l+\frac{1}{2}\frac{y^2}{l}} = \Big|_c^{b}{}_{a-l} - y\,\frac{(a-l)c}{b^2\varsigma_1^2+(a-l)^2c^2}\,\frac{\varsigma_1^2+b^2}{\varsigma_1} + \frac{1}{2}\,\frac{y^2bc}{(b^2\varsigma_1^2+(a-l)^2c^2)\varsigma_1}\left\{\frac{\varsigma_1^2-(a-l)^2}{l} - (a-l)\left(3-\frac{b^2}{\varsigma_1^2}-2\frac{(\varsigma_1^2+b^2)^2}{b^2\varsigma_1^2+(a-l)^2c^2}\right)\right\}$$

$$\int_{-l\sin\varphi}^{+l\sin\varphi} dy \Big|_c^{b+y}{}_{a-l\cos\varphi} = 2l\sin\varphi \Big|_c^{b}{}_{a-l} + \frac{1}{3}l^3\sin^3\varphi\,\frac{bc}{(b^2\varsigma_1^2+(a-l)^2c^2)\varsigma_1}\left\{\frac{\varsigma_1^2-(a-l)^2}{l} - (a-l)\left(\qquad\right)\right\}$$

$$\int_{-l\sin\varphi}^{l\sin\varphi} dy \Big|_c^{b+y}{}_{a+l\cos\varphi} = 2l\sin\varphi \Big|_c^{b}{}_{a+l} + \frac{1}{3}l^3\sin^3\varphi\,\frac{bc}{(b^2\varsigma_2^2+(a+l)^2c^2)\varsigma_2}\left\{-\frac{\varsigma_2^2-(a+l)^2}{l} - (a+l)\left(3-\frac{b^2}{\varsigma_2^2}-2\frac{(\varsigma_2^2+b^2)^2}{b^2\varsigma_2^2+(a+l)^2c^2}\right)\right\}$$

Véges hiány φ-re. 1898 Október.



$$-\frac{Y}{f\sigma} = 2\int_{y=-l\sin\varphi}^{y=+l\sin\varphi} dy \Big|_{c}^{b+y}{}_{(a-l)+l(1-\cos\varphi)} + 2\int_{y=-l\sin\varphi}^{y=+l\sin\varphi} dy \Big|_{c}^{b+y}{}_{(a+l)-l(1-\cos\varphi)}$$

$$f(x+h, y+k) = f(xy) + h\frac{\partial f}{\partial x} + k\frac{\partial f}{\partial y} + \frac{1}{2}h^2\frac{\partial^2 f}{\partial x^2}$$

$$\Big|_{c}^{b}{}^{a} = \operatorname{arctg}\frac{bc}{a\sqrt{a^2+b^2c^2}} \qquad S = \sqrt{a^2+b^2+c^2}$$

$$\frac{\partial}{\partial a}\Big|_{c}^{b}{}^{a} = -\frac{bc}{a^2S^2+b^2c^2}\,\frac{S^2+a^2}{S}$$

$$\frac{\partial^2}{\partial a^2}\Big|_{c}^{b}{}^{a} = -\frac{abc}{(a^2S^2+b^2c^2)S}\left\{3 - \frac{a^2}{S^2} - 2\frac{(S^2+a^2)^2}{(a^2S^2+b^2c^2)}\right\}$$

$$\frac{\partial}{\partial b}\Big|_{c}^{b}{}^{a} = \frac{ac}{S(a^2+b^2)}$$

$$\Big|_{c}^{b+y}{}_{(a-l)+l(1-\cos\varphi)} = \Big|_{c}^{b}{}_{a-l} - y\frac{(a-l)c}{b^2S_1^2+(a-l)^2c^2}\,\frac{S_1^2+b^2}{S_1} - \frac{y^2}{2}\frac{b(a-l)c}{(b^2S_1^2+(a-l)^2c^2)S_1}\left\{3-\frac{b^2}{S_1^2} - 2\frac{(S_1^2+b^2)^2}{b^2S_1^2+(a-l)^2c^2}\right\}$$
$$+\, l(1-\cos\varphi)\frac{bc}{S_1(b^2+(a-l)^2)}$$

$$\int_{-l\sin\varphi}^{+l\sin\varphi} dy \Big|_{c}^{b+y}{}_{(a-l)+l(1-\cos\varphi)} = 2l\sin\varphi \Big|_{c}^{b}{}_{a-l} - \frac{1}{3}l^3\sin^3\varphi\,\frac{b(a-l)c}{(b^2S_1^2+(a-l)^2c^2)S_1}\left\{3-\frac{b^2}{S_1^2} - 2\frac{(S_1^2+b^2)^2}{b^2S_1^2+(a-l)^2c^2}\right\}$$
$$+\, 2l^2\sin\varphi(1-\cos\varphi)\frac{bc}{b^2S_1^2+(a-l)^2c^2}\cdot\frac{S_1^2-(a-l)^2}{S_1}$$

$S_1^2 = (a-l)^2+b^2+c^2$
$S_2^2 = (a+l)^2+b^2+c^2$

$$\int_{-l\sin\varphi}^{+l\sin\varphi} dy \Big|_{c}^{b+y}{}_{(a+l)-l(1-\cos\varphi)} = 2l\sin\varphi \Big|_{c}^{b}{}_{a+l} - \frac{1}{3}l^3\sin^3\varphi\,\frac{b(a+l)c}{(b^2S_2^2+(a+l)^2c^2)S_2}\left\{3-\frac{b^2}{S_2^2} - 2\frac{(S_2^2+b^2)^2}{b^2S_2^2+(a+l)^2c^2}\right\}$$
$$-\, 2l^2\sin\varphi(1-\cos\varphi)\frac{bc}{b^2S_1^2+(a+l)^2c^2}\cdot\frac{S_2^2-(a+l)^2}{S_2}$$

Végin hiány φ-ról $\varrho_1^2=(a-l)^2+b^2+c^2 \quad \varrho_2^2=(a+l)^2+b^2+c^2$

$$\cancel{Y=-4f\sigma l\sin\varphi\left\{\Big|_c^{a-l}+\Big|_c^{a+l}\right\}-4f\sigma l\sin^2\varphi\left\{\frac{l^2(a-l)bc}{6(b^2\varrho_1^2+(a-l)^2c^2)\varrho_1}\left[-3+2\frac{(b^2+\varrho_1^2)^2}{b^2\varrho_1^2+(a-l)^2c^2}+\frac{b^2}{\varrho_1^2}\right]+\right.}$$

$$\cancel{\left.+\frac{l^2(a+l)bc}{6(b^2\varrho_2^2+(a+l)^2c^2)\varrho_2}\left[-3+2\frac{(b^2+\varrho_2^2)^2}{(b^2\varrho_2^2+(a+l)^2c^2)}+\frac{b^2}{\varrho_2^2}\right]\right\}-4f\sigma l\sin^2\varphi\frac{lbc}{6}\left\{\frac{1}{\varrho_1((a-l)^2+b^2)}-\frac{1}{\varrho_2((a+l)^2+b^2)}\right\}}$$

$$-\frac{X}{2f\sigma}=2\int_{x=+l}^{x=+l}dx\Big|_c^{a+x}b+\int_{-l}^{+l}dx\left(\frac{\partial}{\partial b}\Big|_c^{a+x}b\ \ldots\sin\varphi+\frac{1}{2}\frac{\partial^2}{\partial b^2}l\sin^2\varphi\Big|_c^{a+x}b\right.-\frac{\partial}{\partial b}\sin\varphi\Big|_c^{a+x}b+\frac{1}{2}\frac{\partial^2}{\partial b^2}\sin^2\varphi\Big|_c^{a+x}b\Bigg)$$

$$+2\int_{-l\cos\varphi=-l+\frac{1}{2}\varphi^2}^{-l}dx\Big|_c^{a+x}b+2\int_{l}^{l\cos\varphi=+l-\frac{l}{2}\varphi^2}dx\Big|_c^{a+x}b$$

$$-\frac{X}{4f\sigma}=2\left\{(a+l)\Big|_c^{a+l}b-(a-l)\Big|_c^{a-l}b+b\left\{\Big|\!\Big|\!\Big|_c^{a+l}b-\Big|\!\Big|_c^{a-l}b\right\}+c\left\{\Big|\!\Big|\!\Big|_c^{a+l}b-\Big|\!\Big|\!\Big|_c^{a-l}b\right\}\right\}$$

$$+l^2\sin^2\varphi\, bc\left(\frac{1}{\varrho_2((a+l)^2+b^2)}-\frac{1}{\varrho_1((a-l)^2+b^2)}\right)$$

$$-l\varphi^2\Big|_c^{a+l}b-l\varphi^2\Big|_c^{a-l}b$$

az az végin ...

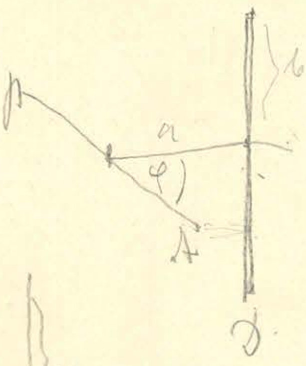
$$-\left[(a+l)\Big|_c^{a+l}b-(a-l)\Big|_c^{a-l}b+b\left\{\Big|\!\Big|_c^{a+l}b-\Big|\!\Big|_c^{a-l}b\right\}+c\left\{\Big|\!\Big|\!\Big|_c^{a+l}b-\Big|\!\Big|\!\Big|_c^{a-l}b\right\}\right]=\frac{X_0}{4f\sigma}$$

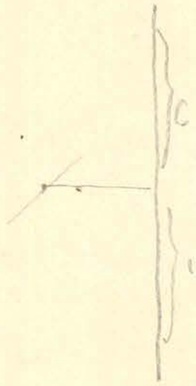
$$X=X_0+2f\sigma l^2\sin^2\varphi\, bc\left(\frac{1}{\varrho_1((a-l)^2+b^2)}-\frac{1}{\varrho_2((a+l)^2+b^2)}\right)+2f\sigma l\varphi^2\left\{\Big|_c^{a+l}b+\Big|_c^{a-l}b\right\}$$

$$Y=-4f\sigma l\sin\varphi\left\{\Big|_c^{a-l}b+\Big|_c^{a+l}b\right\}-4f\sigma l\sin^2\varphi\left\{\frac{l^2}{6}\frac{(a-l)bc}{(b^2\varrho_1^2+(a-l)^2c^2)\varrho_1}\left[-3+2\frac{(b^2+\varrho_1^2)^2}{b^2\varrho_1^2+(a-l)^2c^2}+\frac{b^2}{\varrho_1^2}\right]+\right.$$

$$\left.+\frac{l^2}{6}\frac{b(a+l)c}{(b^2\varrho_2^2+(a+l)^2c^2)\varrho_2}\left[-3+2\frac{(b^2+\varrho_2^2)^2}{b^2\varrho_2^2+(a+l)^2c^2}+\frac{b^2}{\varrho_2^2}\right]\right\}-4f\sigma l^2\frac{\sin^3\varphi}{2}\left\{\frac{bc}{\varrho_1((a-l)^2+b^2)}-\frac{bc}{\varrho_2((a+l)^2+b^2)}\right\}$$

Verticalis lineg forgásmomentuma. 1899 jun 9





A ban lévő tömegre forgásmomentum

$$A = -2f\delta l\cos\varphi \left(\Big\|_c^{b+l\sin\varphi}{}^{}_{a-l\cos\varphi} - \Big\|_c^{b-l\sin\varphi}{}^{}_{a-l\cos\varphi} \right)$$

$$-2f\delta l\sin\varphi \left(\Big|_c^{a-l\cos\varphi}{}_{b+l\sin\varphi} + \Big|_c^{a-l\cos\varphi}{}_{b-l\sin\varphi} \right)$$

B ban lévő tömegpár forgásmomentuma B:

$$B = -2f\delta l\cos\varphi \left(\Big\|_c^{b+l\sin\varphi}{}_{a+l\cos\varphi} - \Big\|_c^{b-l\sin\varphi}{}_{a+l\cos\varphi} \right)$$

$$+2f\delta l\sin\varphi \left(\Big|_c^{a+l\cos\varphi}{}_{b+l\sin\varphi} + \Big|_c^{a+l\cos\varphi}{}_{b-l\sin\varphi} \right)$$

a rúdban a forgástól egyenlő kétoldalt l távolságra gyűjtve a tömeg egyszerű tömegpontpárra mondhatjuk

$$F = \frac{A+B}{2}$$

$$F = -f l^2\cos\varphi\,\delta\,\frac{1}{l}\left\{ \left(\Big\|_c^{b+l\sin\varphi}{}_{a-l\cos\varphi} - \Big\|_c^{b-l\sin\varphi}{}_{a-l\cos\varphi} \right) + \left(\Big\|_c^{b+l\sin\varphi}{}_{a+l\cos\varphi} - \Big\|_c^{b-l\sin\varphi}{}_{a+l\cos\varphi} \right) \right\}$$

$$-f l^2\sin\varphi\,\delta\,\frac{1}{l}\left\{ \Big|_c^{a-l\cos\varphi}{}_{b+l\sin\varphi} + \Big|_c^{a-l\cos\varphi}{}_{b-l\sin\varphi} - \Big|_c^{a+l\cos\varphi}{}_{b+l\sin\varphi} - \Big|_c^{a+l\cos\varphi}{}_{b-l\sin\varphi} \right\}$$

Legszebb egyszerű lineg ... $\varphi = 0$ állás körül

A pontban forgásmomentum $= -4l^2 f\delta\varphi\,\delta \dfrac{cb}{((a-l)^2+b^2)\sqrt{(a-l)^2+b^2+c^2}} - 4f\delta\delta l\varphi\dfrac{1}{l}\Big|_c^{a-l}{}_{b}$

B pontban $= -4l^2 f\delta\varphi\,\delta \dfrac{cb}{((a+l)^2+b^2)\sqrt{(a+l)^2+b^2+c^2}} + 4f\delta\delta l^2\varphi\dfrac{1}{l}\Big|_c^{a+l}{}_{b}$

$\frac{A+B}{2}$ $$\left(\frac{\partial F}{\partial\varphi}\right)_0 = -2fl^2\delta\,\delta\left\{ \frac{bc}{((a-l)^2+b^2)\sqrt{(a-l)^2+b^2+c^2}} + \frac{bc}{((a+l)^2+b^2)\sqrt{(a+l)^2+b^2+c^2}} + \frac{1}{l}\Big|_c^{a-l}{}_{b} - \frac{1}{l}\Big|_c^{a+l}{}_{b} \right\}$$

hasonló $$\left(\frac{\partial F}{\partial\varphi}\right)_{\frac{\pi}{2}} = -2f\delta l^2\delta\left\{ \frac{\partial\left(\Big|_c^{a}{}_{b-l} + \Big|_c^{a}{}_{b+l}\right)}{\partial a} - \frac{1}{l}\left(\Big\|_c^{b+l}{}_{a} - \Big\|_c^{b-l}{}_{a} \right) \right\}$$

$S^2 = a^2+(b-l)^2+c^2$
$S'^2 = a^2+(b+l)^2+c^2$

$$\frac{\partial}{\partial a}\left(\Big|_c^{a}{}_{b-l} + \Big|_c^{a}{}_{b+l}\right) = -c\left[\left(S+\frac{a^2}{S}\right)\frac{b-l}{a^2S^2+(b-l)^2c^2} + \left(S'+\frac{a^2}{S'}\right)\frac{b+l}{a^2S'^2+(b+l)^2c^2}\right]$$

16.

$a = b = l = 1 \qquad c = 2\ \text{re}.$

$$\frac{1}{4f\sigma l^2} F_{22\frac{1}{2}} = -0{,}410278 \qquad \left(\frac{\partial F}{\partial \varphi}\right)_0 = -0{,}881463$$

$$\frac{1}{4f\sigma l^2} F_{67\frac{1}{2}} = -0{,}246254 \qquad \left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}} = 0{,}586126$$

$$\frac{1}{4f\sigma l^2} F_{45} = -0{,}521748$$

ezekből

$$F = -4\pi f\sigma l^2 \left\{0{,}492793 \sin 2\varphi + 0{,}082024 \sin 4\varphi - 0{,}033584 \sin 6\varphi - 0{,}022553 \sin 8\varphi - 0{,}005029 \sin 10\varphi\right\}$$

$a = 3 \quad b = 1 \quad l = 1 \qquad c = 2\ \text{re}.$

$$\frac{1}{4f\sigma l^2} F_{22\frac{1}{2}} = -0{,}061546 \qquad \frac{1}{4f\sigma l^2}\left(\frac{\partial F}{\partial \varphi}\right)_0 = -0{,}186078$$

$$\frac{1}{4f\sigma l^2} F_{67\frac{1}{2}} = -0{,}045773 \qquad \frac{1}{4f\sigma l^2}\left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}} = +0{,}122403 \quad \cancel{+0{,}1236012}$$

$$\frac{1}{4f\sigma l^2} F_{45} = -0{,}074666$$

ezekből

$$F = -4f\sigma l^2 \left\{0{,}0752760 \sin 2\varphi + 0{,}0078865 \sin 4\varphi + 0{,}0006105 \sin 6\varphi + 0{,}0000340 \sin 8\varphi + 0{,}0000005 \sin 10\varphi\right\}$$

$$F = -f\sigma l^2 \left\{0{,}301104 \sin 2\varphi + 0{,}031546 \sin 4\varphi + 0{,}002442 \sin 6\varphi + 0{,}000136 \sin 8\varphi + 0{,}000002 \sin 10\varphi\right\}$$

1898 Nov.

Vizsgálódás $C m l^2$re vonatkozólag legkedvezőbb alakot illetőleg.

keret magasság $m = c = 2$
szélesség $s = b = 1$
hosszúság $h = a$ különböző értékei.

$\lambda = 0$ ra.

$$\frac{\mathfrak{M}_l}{4 f \sigma \lambda^2} = -\frac{\mathfrak{M}_t}{4 f \sigma \lambda^2} = -2\left\{ \left|\begin{smallmatrix}1\\ a\\ 2\end{smallmatrix}\right. - \left|\begin{smallmatrix}a\\ 1\\ 2\end{smallmatrix}\right. \right\}$$

$\lambda = 1$ re

$$\frac{\mathfrak{M}_l}{4 f \sigma \lambda^2} = -\left\{ \left|\begin{smallmatrix}1\\ a-1\\ 2\end{smallmatrix}\right. + \left|\begin{smallmatrix}1\\ a+1\\ 2\end{smallmatrix}\right. \right\} + (a+1)\left|\begin{smallmatrix}a+1\\ 1\\ 2\end{smallmatrix}\right. - (a-1)\left|\begin{smallmatrix}a-1\\ 1\\ 2\end{smallmatrix}\right. + \left\{ \underline{II}\begin{smallmatrix}a+1\\ 1\\ 2\end{smallmatrix} - \underline{II}\begin{smallmatrix}a-1\\ 1\\ 2\end{smallmatrix} \right\} + 2\left\{ \underline{III}\begin{smallmatrix}a+1\\ 1\\ 2\end{smallmatrix} - \underline{III}\begin{smallmatrix}a-1\\ 1\\ 2\end{smallmatrix} \right\}$$

$$\frac{\mathfrak{M}_t}{4 f \sigma \lambda^2} = -\left\{ \left|\begin{smallmatrix}a\\ 0\\ 2\end{smallmatrix}\right. + \left|\begin{smallmatrix}a\\ 2\\ 2\end{smallmatrix}\right. \right\} + 2\left|\begin{smallmatrix}2\\ a\\ 2\end{smallmatrix}\right. + a\left\{ \underline{II}\begin{smallmatrix}2\\ a\\ 2\end{smallmatrix} - \underline{II}\begin{smallmatrix}0\\ a\\ 2\end{smallmatrix} \right\} + 2\left\{ \underline{III}\begin{smallmatrix}2\\ a\\ 2\end{smallmatrix} - \underline{III}\begin{smallmatrix}0\\ a\\ 2\end{smallmatrix} \right\}$$

1) $\left|\begin{smallmatrix}1\\ a\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{2a}{\sqrt{a^2+5}}$

2) $\left|\begin{smallmatrix}a\\ 1\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{2}{a\sqrt{a^2+5}}$

3) $\left|\begin{smallmatrix}1\\ a-1\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{(a-1)2}{\sqrt{(a-1)^2+5}}$

4) $\left|\begin{smallmatrix}1\\ a+1\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{(a+1)2}{\sqrt{(a+1)^2+5}}$

5) $\left|\begin{smallmatrix}a+1\\ 1\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{2}{(a+1)\sqrt{(a+1)^2+5}}$

6) $\left|\begin{smallmatrix}a-1\\ 1\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{2}{(a-1)\sqrt{(a-1)^2+5}}$

7) $\left|\begin{smallmatrix}a\\ 0\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \cancel{0}$

8) $\left|\begin{smallmatrix}a\\ 2\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{4}{a\sqrt{a^2+8}}$

9) $\left|\begin{smallmatrix}2\\ a\\ 2\end{smallmatrix}\right. = \operatorname{arctg} \frac{a}{\sqrt{a^2+8}}$

10) $\left(\underline{II}\begin{smallmatrix}a+1\\ 1\\ 2\end{smallmatrix} - \underline{II}\begin{smallmatrix}a-1\\ 1\\ 2\end{smallmatrix} \right) = \log \frac{\sqrt{(a+1)^2+1}}{\sqrt{(a-1)^2+1}} \frac{2+\sqrt{(a-1)^2+5}}{2+\sqrt{(a+1)^2+5}}$

11) $\left(\underline{II}\begin{smallmatrix}2\\ a\\ 2\end{smallmatrix} - \underline{II}\begin{smallmatrix}0\\ a\\ 2\end{smallmatrix} \right) = \log \frac{\sqrt{a^2+4}}{a} \frac{2+\sqrt{a^2+4}}{2+\sqrt{a^2+8}}$

12) $\left(\underline{III}\begin{smallmatrix}a+1\\ 1\\ 2\end{smallmatrix} - \underline{III}\begin{smallmatrix}a-1\\ 1\\ 2\end{smallmatrix} \right) = \log \frac{\sqrt{(a+1)^2+4}}{\sqrt{(a-1)^2+4}} \frac{1+\sqrt{(a-1)^2+5}}{1+\sqrt{(a+1)^2+5}}$

13) $\left(\underline{III}\begin{smallmatrix}2\\ a\\ 2\end{smallmatrix} - \underline{III}\begin{smallmatrix}0\\ a\\ 2\end{smallmatrix} \right) = \log \frac{\sqrt{8}\,(a+\sqrt{a^2+4})}{2\,(a+\sqrt{a^2+8})}$

		$\frac{\mathfrak{M}_l}{4 f \sigma \lambda^2}$	$\frac{\mathfrak{M}_t}{4 f \sigma \lambda^2}$	Diff.
$a = 2$	$\lambda = 0$	$-1{,}211086$	$+1{,}211086$	$2{,}422172$
	$\lambda = 1$	$-0{,}984724$	$+1{,}415171$	$2{,}399895$
$a = ?$	$\lambda = 0$	$-1{,}673752$	$+1{,}673752$	$3{,}347504$
	$\lambda = 1$	$-1{,}600203$	$+1{,}774195$	$3{,}374398$
$a = \infty$	$\lambda = 0$	$-2{,}214300$	$+2{,}214300$	$4{,}428600$
	$\lambda = 1$	$-2{,}214300$	$+2{,}263942$	$4{,}478242$

Termik $\quad h = m = a = c = 1$

b változik.

$\lambda = 0$ ra

$$\frac{H_l}{4\pi\sigma\lambda^2} = -\frac{H_t}{4\pi\sigma\lambda^2} = -2\left\{\Big|_1^{b}{}_1 - \Big|_{b}^{1}{}_1\right\}$$

$\lambda = b$ re

$$\frac{H_l}{4\pi\sigma\lambda^2} = -\left[\Big|_{1-b}^{b}{}_1 + \Big|_{1+b}^{b}{}_1\right] + \left(\frac{1}{b}+1\right)\Big|_{b}^{1+b}{}_1 - \left(\frac{1}{b}-1\right)\Big|_{b}^{1-b}{}_1 + \left\{ II\Big|_{b}^{1+b}{}_1 - II\Big|_{b}^{1-b}{}_1\right\} + \frac{1}{b}\left\{ III\Big|_{b}^{1+b}{}_1 - III\Big|_{b}^{1-b}{}_1\right\}$$

$$\frac{H_t}{4\pi\sigma\lambda^2} = -\left[\Big|_0^1{}_1 + \Big|_{2b}^{1}{}_1\right] + 2\Big|_1^{2b}{}_1 + \frac{1}{b}\left\{ II\Big|_1^{2b}{}_1 - II\Big|_1^{0}{}_1\right\} + \frac{1}{b}\left\{ III\Big|_1^{2b}{}_1 - III\Big|_1^{0}{}_1\right\}$$

1) $\Big|_1^{b}{}_1 = \operatorname{arctg} \dfrac{1}{b\sqrt{b^2+2}}$

2) $\Big|_b^{1}{}_1 = \operatorname{arctg} \dfrac{b}{\sqrt{b^2+2}}$

3) $\Big|_{1-b}^{b}{}_1 = \operatorname{arctg} \dfrac{1-b}{b\sqrt{1+b^2+(1-b)^2}}$

4) $\Big|_{1+b}^{b}{}_1 = \operatorname{arctg} \dfrac{1+b}{b\sqrt{1+b^2+(1+b)^2}}$

5) $\Big|_b^{1+b}{}_1 = \operatorname{arctg} \dfrac{b}{(1+b)\sqrt{1+b^2+(1+b)^2}}$

6) $\Big|_b^{1-b}{}_1 = \operatorname{arctg} \dfrac{b}{(1-b)\sqrt{1+b^2+(1-b)^2}}$

7) $\Big|_0^{1}{}_1 = \operatorname{arctg} 0$

8) $\Big|_{2b}^{1}{}_1 = \operatorname{arctg} \dfrac{2b}{\sqrt{2+4b^2}}$

9) $\Big|_1^{2b}{}_1 = \operatorname{arctg} \dfrac{1}{2b\sqrt{2+4b^2}}$

10) $\left\{ II\Big|_b^{1+b}{}_1 - II\Big|_b^{1-b}{}_1\right\} = \log \dfrac{\sqrt{(1+b)^2+b^2}}{\sqrt{(1-b)^2+b^2}} \cdot \dfrac{1+\sqrt{(1-b)^2+b^2+1}}{1+\sqrt{(1+b)^2+b^2+1}}$

11) $\left\{ II\Big|_1^{2b}{}_1 - II\Big|_1^{0}{}_1\right\} = \log \dfrac{\sqrt{4b^2+1}}{1} \cdot \dfrac{1+\sqrt{2}}{1+\sqrt{4b^2+2}}$

12) $\left\{ III\Big|_b^{1+b}{}_1 - III\Big|_b^{1-b}{}_1\right\} = \log \dfrac{\sqrt{(1+b)^2+1}}{\sqrt{(1-b)^2+1}} \cdot \dfrac{b+\sqrt{(1-b)^2+b^2+1}}{b+\sqrt{(1+b)^2+b^2+1}}$

13) $\left\{ III\Big|_1^{2b}{}_1 - III\Big|_1^{0}{}_1\right\} = \log \dfrac{\sqrt{4b^2+1}}{1} \cdot \dfrac{1+\sqrt{2}}{1+\sqrt{4b^2+2}}$

		$\frac{H_l}{4\pi\sigma\lambda^2}$	$\frac{H_t}{4\pi\sigma\lambda^2}$	
$b = \infty$	$\lambda = 0$	$-3{,}141592$	$+3{,}141592$	2π
	$\lambda = b$	$-3{,}141592$	$+3{,}141592$	2π.
$b = \frac{1}{4}$	$\lambda = 0$	$-2{,}107486$	$+2{,}107486$	$4{,}214972$
	$\lambda = b$	$-2{,}070634$	$+2{,}146080$	$4{,}216714$
$b = \frac{1}{3}$	$\lambda = 0$	$-1{,}788518$	$+1{,}788518$	$3{,}577036$
	$\lambda = b$	$-1{,}706455$	$+1{,}869561$	$3{,}576016$
$b = \frac{1}{2}$	$\lambda = 0$	$-1{,}211086$	$+1{,}211086$	$2{,}422172$
	$\lambda = b$	$-0{,}984724$	$+1{,}415171$	$2{,}399895$
$b = \frac{1}{1}$	$\lambda = 0$	0	0	0
	$\lambda = b$	$+0{,}613720$	$+0{,}613720$	0

Az előbbi más módokban.

tehát $b = s = 1$

$h = a = m = c = \underline{\underline{n}}$ n változó szám.

$\lambda = 0$ ra.

$$\frac{\mathcal{H}_\lambda}{4f\sigma\lambda^2} = -\frac{\mathcal{H}_t}{4f\sigma\lambda^2} = -2\left\{\left|\begin{smallmatrix}1\\n\\n\end{smallmatrix}\right. - \left|\begin{smallmatrix}n\\1\\n\end{smallmatrix}\right.\right\}$$

$\lambda = 1$ re.

lejt $$\frac{\mathcal{H}_t}{4f\sigma\lambda^2} = -\left\{\left|\begin{smallmatrix}1\\n-1\\n\end{smallmatrix}\right. + \left|\begin{smallmatrix}1\\n+1\\n\end{smallmatrix}\right.\right\} + (n+1)\left|\begin{smallmatrix}n+1\\1\\n\end{smallmatrix}\right. - (n-1)\left|\begin{smallmatrix}n-1\\1\\n\end{smallmatrix}\right. + \left(\left\|\begin{smallmatrix}n+1\\1\\n\end{smallmatrix}\right. - \left\|\begin{smallmatrix}n-1\\1\\n\end{smallmatrix}\right.\right) + n\left\{\Big|\!\Big|\!\Big|\begin{smallmatrix}n+1\\1\\n\end{smallmatrix} - \Big|\!\Big|\!\Big|\begin{smallmatrix}n-1\\1\\n\end{smallmatrix}\right\}$$

hossz $$\frac{\mathcal{H}_t}{4f\sigma\lambda^2} = -\left\{\left|\begin{smallmatrix}n\\0\\n\end{smallmatrix}\right. + \left|\begin{smallmatrix}n\\2\\n\end{smallmatrix}\right.\right\} + 2\left|\begin{smallmatrix}2\\n\\n\end{smallmatrix}\right. + n\left\{\left\|\begin{smallmatrix}2\\n\\n\end{smallmatrix}\right. - \left\|\begin{smallmatrix}0\\n\\n\end{smallmatrix}\right.\right\} + n\left\{\Big|\!\Big|\!\Big|\begin{smallmatrix}2\\n\\n\end{smallmatrix} - \Big|\!\Big|\!\Big|\begin{smallmatrix}0\\n\\n\end{smallmatrix}\right\}$$

1) $\left|\begin{smallmatrix}1\\n\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{n^2}{\sqrt{2n^2+1}}$

2) $\left|\begin{smallmatrix}n\\1\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{n}{\sqrt{2n^2+1}}$

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3) $\left|\begin{smallmatrix}1\\n-1\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{(n-1)n}{\sqrt{1+(n-1)^2+n^2}}$

4) $\left|\begin{smallmatrix}1\\n+1\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{(n+1)n}{\sqrt{1+(n+1)^2+n^2}}$

5) $\left|\begin{smallmatrix}n+1\\1\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{n}{(n+1)\sqrt{1+(n+1)^2+n^2}}$

6) $\left|\begin{smallmatrix}n-1\\1\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{n}{(n-1)\sqrt{1+(n-1)^2+n^2}}$

7) $\left|\begin{smallmatrix}n\\0\\n\end{smallmatrix}\right. = \operatorname{arctg} 0$

8) $\left|\begin{smallmatrix}n\\2\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{2}{\sqrt{2n^2+4}}$

9) $\left|\begin{smallmatrix}2\\n\\n\end{smallmatrix}\right. = \operatorname{arctg} \frac{n^2}{2\sqrt{2n^2+4}}$

$10 = \log \frac{\sqrt{(n+1)^2+1}}{\sqrt{(n-1)^2+1}} \frac{n+\sqrt{(n-1)^2+n^2+1}}{n+\sqrt{(n+1)^2+n^2+1}}$

$11 = \log \frac{\sqrt{n^2+4}}{n} \frac{n+\sqrt{\cancel{}+2n^2}}{n+\sqrt{4+2n^2}}$

$12 = \log \frac{\sqrt{(n+1)^2+n^2}}{\sqrt{(n-1)^2+n^2}} \frac{n+\sqrt{(n-1)^2+n^2+1}}{n+\sqrt{(n+1)^2+n^2+1}}$

$13 = \log \frac{\sqrt{n^2+4}}{n} \frac{n+\sqrt{2n^2}}{n+\sqrt{4+2n^2}}$

1) $\overset{3,347504}{\cancel{6,6\ldots 8}}(1+p+p') + 0,012240 + 0,000800 = 3,374398$ 2

2) $3,347504\left(1+\frac{p}{4}+\frac{p'}{16}\right) - 0,000765 + 0,000003 = 3,356903$

3) $8q + 8q' + 0,002992 = \cancel{\ldots} = -0,173992$

4) $2q + \frac{q'}{2} + 0,000047 = -0,043817.$

1) $p + p' = 0,01145100$

2) $p + \frac{p'}{4} = 0,01214156$

3) $q + q' = 0,022123$

4) $q + \frac{q'}{4} = -0,021932$

ezekből $p' = 0,0009207$ $p = 0,0123717.$

$q' = + 0,000255$ $q = 0,021868$

e minus

probatum
$$\begin{cases} (\alpha_2)_\lambda = +0,836876\left(1 + 0,0123717\,\lambda^2 - 0,0009207\,\lambda^4\right) \\ (\alpha_4)_\lambda = -0,021868\,\lambda^2 - 0,000255\,\lambda^4 \end{cases}$$

$\lambda = 0,8$ ra $\begin{cases} (\alpha_2)_{0,8} = 0,843186 \\ (\alpha_4)_{0,8} = -0,0141000 \end{cases}$

$2\alpha_2 = +1,686372$

$4\alpha_4 = -0,056400$

$6\alpha_6 = -0,002507$

$8\alpha_8 = +0,000392$

$10\alpha_{10} = +0,000067.$

e nemek

$\log \lambda_{\pi} = 1,627924$

transversalis $1,739940$

összeg $3,367864$

<u>tegyük</u> $\alpha_4 = q\lambda^2 + q'\lambda^6$

és

$$\left[\left(\frac{\partial F}{\partial \varphi_0}\right) + \left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{4}}\right]_{\lambda=1} = -(8q + 8q' + 16\alpha_8)\, 4\psi_0 l^2$$

$$\left[\left(\frac{\partial F}{\partial \varphi_0}\right) + \left(\frac{\partial F}{\partial \varphi}\right)\right]_{\lambda=\frac{1}{2}} = -\left(2q + \frac{1}{8}q'\right. \overset{+16(\alpha_8)_{\frac{1}{2}}\cdot\frac{1}{64}}{\cancel{4\psi_0 l^2}} \Big)$$

$$q + q' = -0{,}022123$$
$$q + \frac{1}{16}q' = -0{,}021932$$

$$q' = \cancel{0{,}000191}\ -0{,}000203$$
$$q = -0{,}021920$$

$$(\alpha_4)_{0,8} = -0{,}014082 \qquad 4\alpha_4 = -0{,}056328$$

c mint

longit. = 1,627996

transv. = 1,709868

arány 0,367864

Formula 1-ra. terv(?)

1)

$$(\alpha_2)_\lambda = (\alpha_2)_0 (1 + p\lambda^2 + p'\lambda^4)$$

$$\alpha_4 = q\lambda^2 + q'\lambda^4$$

$$\alpha_6 = (\alpha_6)_1 \lambda^4$$

$$\alpha_8 = (\alpha_8)_1 \lambda^6$$

$$\alpha_{10} = (\alpha_{10})_1 \lambda^8$$

hossz. $\left(\frac{\partial F}{\partial \varphi}\right)_0 = -4\pi\sigma l^2 (2\alpha_2 + 4\alpha_4 + 6\alpha_6 + 8\alpha_8 + \dots)$

hossz. $\left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}} = -4\pi\sigma l^2 (-2\alpha_2 + 4\alpha_4 - 6\alpha_6 + 8\alpha_8 \quad)$

$$\left[\left(\frac{\partial F}{\partial \varphi}\right)_0 - \left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}}\right]_{\lambda=1} = -4\pi\sigma l^2 \left(4(\alpha_2)_0(1+p+p') + 12(\alpha_6)_1 + 20(\alpha_{10})_1\right) \quad \dots 1)$$

$$\left[\left(\frac{\partial F}{\partial \varphi}\right)_0 - \left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}}\right]_{\lambda=\frac{1}{2}} = -4\pi\sigma l^2 \left(4(\alpha_2)_0\left(1+\frac{p}{4}+\frac{p'}{16}\right) + 12(\alpha_6)_1\frac{1}{16} + 20(\alpha_{10})_1\frac{1}{256}\right) \quad \dots 2)$$

$$\left[\left(\frac{\partial F}{\partial \varphi}\right)_0 + \left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}}\right]_{\lambda=1} = -4\pi\sigma l^2 \left(8q + 8q' + 16(\alpha_8)_1\right) \quad 3)$$

$$\left[\left(\frac{\partial F}{\partial \varphi}\right)_0 + \left(\frac{\partial F}{\partial \varphi}\right)_{\frac{\pi}{2}}\right]_{\lambda=\frac{1}{2}} = -4\pi\sigma l^2 \left(8q\frac{1}{4} + 8q'\frac{1}{16} + 16(\alpha_8)_1\frac{1}{64}\right) \quad 4)$$

Négyzetes oszlopok. 1899 Január 5 ikén délutáni jónak tartott értékek.

$$F = 4f\sigma l^2 \Big\{ \big((\alpha_4\lambda^2 + \alpha_4'\lambda^4 + \alpha_4''\lambda^6) \big) \sin 4\vartheta - 0{,}0059479\lambda^6 \sin 8\vartheta + 0{,}00056845\lambda^{10} \sin 12\vartheta$$
$$- 0{,}00007947\lambda^{14} \sin 16\vartheta + 0{,}000010926\lambda^{18} \sin 20\vartheta \Big\}$$

λ	$\frac{1}{4f\sigma\lambda^2}\left(\frac{\partial F}{\partial \varphi}\right)_0$
végés kicsiny	$0{,}665898\lambda^2 = 0{,}1664745{,}4$
0,3	0,059916
0,6	
0,8	0,414514
1,0	0,624403

$8\alpha_8 = -0{,}0475832$
$12\alpha_{12} = +0{,}00682140$
$16\alpha_{16} = -0{,}00127152$

$$\frac{1}{4f\sigma\lambda^2}\left(\frac{\partial F}{\partial \varphi}\right)_0 = 4A_4 + 8\lambda^6\alpha_8 + 12\lambda^{10}\alpha_{12} + 16\lambda^{14}\alpha_{16} + 20\lambda^{18}\alpha_{20}$$

$$A_4 = \alpha_4 + \alpha_4' + \alpha_4'' = 0{,}1665546$$

$$0{,}64\,\alpha_4 + 0{,}4096\,\alpha_4' + 0{,}262144\,\alpha_4'' = 0{,}1065768$$

$$0{,}09\,\alpha_4 + 0{,}0081\,\alpha_4' + 0{,}000729\,\alpha_4'' = 0{,}0149877.$$

$$\begin{cases} \alpha_4 + \alpha_4' + \alpha_4'' = 0{,}1665546 \\ \alpha_4 + 0{,}64\,\alpha_4' + 0{,}4096\,\alpha_4'' = 0{,}1665263 \\ \alpha_4 + 0{,}09\,\alpha_4' + 0{,}0081\,\alpha_4'' = 0{,}1665300 \end{cases}$$

ezekből
$$\begin{cases} \alpha_4 = 0{,}1665360 \\ \alpha_4' = -0{,}0007519 \\ \alpha_4'' = +0{,}0009378 \end{cases}$$

ezekkel számítva $\lambda = 0{,}6$ ra $\left(\frac{\partial F}{\partial \varphi}\right)_0 = 0{,}237610$

$$\frac{8}{20\sqrt{11}}\left(\frac{1}{11}+\frac{24}{20}\right)$$

10 / 1,100 0,09

1,100001

10999826

~~1,29999~~

1,29090909

$\sqrt{14} = \cancel{3,7} = 3,74166.$

~~3,3166~~

3,316625

~~0,6~~ 6 3 3 250

1 658312

8,291562

$$\frac{8c}{9x}\,\frac{\partial u}{\partial c}$$

$c=1$

~~0,7306410~~

0,573064

$$\frac{8c}{(9+c^2)(1+c^2)\sqrt{10+c^2}}\left(\frac{1}{10+c^2}+2\,\frac{10+2c^2}{(9+c^2)(1+c^2)}\right)$$

	$\frac{\partial u}{\partial c}$
$c=1$	0,155689
$c=2$	0,04113518

$$\frac{16}{13.5\sqrt{14}}\left(\frac{1}{14}+\frac{36}{13.5}\right)$$

$$\frac{16}{65\sqrt{14}}\cdot\left(\frac{1}{14}+\frac{36}{65}\right)$$

0,553846

0,071429

0,625275

1,0004400

243,2079

$$\frac{\partial}{\partial x}\left(\mathrm{III}^{x}_{y\,z} - \mathrm{III}^{x'}_{y\,z}\right) = \frac{1}{2}\left(2\frac{z}{x^2+z^2} - 2\frac{z}{x'^2+z^2}\right) + \frac{z}{\left(y+\sqrt{x'^2+y^2+z^2}\right)\sqrt{x'^2+y^2+z^2}} - \frac{z}{\left(y+\sqrt{x^2+y^2+z^2}\right)\sqrt{x^2+y^2+z^2}}$$

$$= z\left\{\frac{x'^2-x^2}{(x^2+z^2)(x'^2+z^2)} + \frac{x^2-x'^2+y\left(\sqrt{x^2+y^2+z^2}-\sqrt{x'^2+y^2+z^2}\right)}{}\right.$$

$$H \cdot \left(-\frac{1}{(b^2+c^2)\sqrt{a^2+b^2+c^2}} + \frac{1}{(a^2+c^2)\sqrt{a^2+b^2+c^2}}\right)$$

$$-\frac{1}{\sqrt{a^2+b^2+c^2}}\left(\frac{1}{b^2+c^2} - \frac{1}{a^2+c^2}\right)$$

$$+\frac{c}{\rho^3}\left(\frac{1}{b^2+c^2} - \frac{1}{a^2+c^2}\right) - \frac{1}{\rho}\left(-\frac{2c}{(b^2+c^2)^2} + \frac{2c}{(a^2+c^2)^2}\right)$$

$$+\frac{c}{\rho^3}\frac{a^2-b^2}{(b^2+c^2)(a^2+c^2)} + \frac{2c}{\rho}\left(\frac{a^4-b^4+2c^2(a^2-b^2)}{(b^2+c^2)^2(a^2+c^2)^2}\right)$$

$$a^2b^2 + 3(a^2c^2+b^2c^2+c^4) + 2\rho^4$$

$$\frac{a^2b^2+a^2c^2+b^2c^2+c^4+2c^2a^2+2c^2b^2+2c^4+2\rho^4}{\rho^2(a^2+c^2)(b^2+c^2)}$$

$$\underline{a^2b^2+3c^2\rho^2+2\rho^4}$$

4

$$\frac{\partial H}{\partial c} = \frac{c(a^2-b^2)}{\rho(a^2+c^2)(b^2+c^2)}\left(\frac{1}{\rho^2} + 2\frac{\rho^2+c^2}{(a^2+c^2)(b^2+c^2)}\right)$$

$a=3 \quad b=1$

$\frac{m}{r^2} = c$

$$\begin{cases} \alpha^2 - \beta^2 = \frac{p}{c} & 1) \\ \alpha\gamma = \frac{q}{c} & 2) \\ \beta\gamma = \frac{r}{c} & 3) \\ \alpha^2 + \beta^2 + \gamma^2 = 1 & 4) \end{cases}$$

2 és 3 ból $\alpha^2 = \frac{q^2}{c^2}\frac{1}{\gamma^2}$ $\beta^2 = \frac{r^2}{c^2}\frac{1}{\gamma^2}$

ezt téve 1 be.

$$\cancel{\frac{q^2}{c^2}\frac{1}{\gamma^2} + \frac{r^2}{c^2}\frac{1}{\gamma^2} + \gamma^2} = 1$$

$$\frac{q^2}{c^2}\frac{1}{\gamma^2} - \frac{r^2}{c^2}\frac{1}{\gamma^2} = \frac{p}{c}$$

$$\gamma^2 = \frac{1}{c}\frac{q^2 - r^2}{p}$$

és mivel 2. és 3 ból $\beta^2 = \frac{r^2}{q^2}\alpha^2$ azért 4)

$$\alpha^2\left(1 + \frac{r^2}{q^2}\right) + \frac{1}{c}\frac{q^2 - r^2}{p} = 1$$

és 1-ből $\alpha^2\left(1 - \frac{r^2}{q^2}\right) = \frac{p}{c}$

$$\alpha^2\left(1 + \frac{r^2}{q^2}\right) = \frac{pc - q^2 + r^2}{pc}$$

$$\frac{1 + \frac{r^2}{q^2}}{1 - \frac{r^2}{q^2}} = \frac{pc - q^2 + r^2}{p^2} = \frac{q^2 + r^2}{q^2 - r^2}$$

$$pc = p^2\frac{q^2 + r^2}{q^2 - r^2} + q^2 - r^2$$

$$\begin{cases} c = \frac{p^2(q^2 + r^2) + (q^2 - r^2)^2}{p(q^2 - r^2)} \\ \gamma^2 = \frac{1}{c}\frac{q^2 - r^2}{p} \\ \alpha^2 = \frac{1}{c}\frac{pq^2}{q^2 - r^2} \\ \beta^2 = \frac{1}{c}\frac{pr^2}{q^2 - r^2} \end{cases}$$