В.Н. Кочетков «Формулы для оценки величин импульсов к статье «Специальная теория относительности: определение зависимости импульса замкнутой системы тел от времени»

V.N. Cochetkov «Formula to estimate the momentum to the article «Special relativity: depending on the definition of the momentum of a closed system of bodies from time»

Тело 1 (Body 1)

$$x_1 = R \cdot \cos(\omega \cdot t_1) \quad (1)$$

$$y_1 = R \cdot \sin(\omega \cdot t_1) \quad (2)$$

$$x'_1 = g \cdot [x_1 - (V \cdot t_1)] \quad (3)$$

$$y'_1 = y_1 \quad (4)$$

$$\bar{x}_1 = \cos(\bar{\omega} \cdot \bar{t}_1) \quad (5)$$

$$\bar{y}_1 = \sin(\bar{\omega} \cdot \bar{t}_1) \quad (6)$$

$$\bar{x}'_1 = g \cdot [\bar{x}_1 - (\bar{V} \cdot \bar{t}_1)] \quad (7)$$

$$\bar{y}'_1 = \bar{y}_1 \quad (8)$$

$$\bar{t}'_1 = g \cdot [\bar{t}_1 - (\bar{V} \cdot \bar{x}_1)] \quad (9)$$

$$\bar{x}_1 = \frac{x_1}{R} \quad (10)$$

$$\bar{y}_1 = \frac{y_1}{R} \quad (11)$$

$$\bar{x}'_1 = \frac{x'_1}{R} \quad (12)$$

$$\bar{y}'_1 = \frac{y'_1}{R} \quad (13)$$

$$\bar{V} = \frac{V}{c} \quad (14)$$

$$\bar{\omega} = \frac{R \cdot \omega}{c} \quad (15)$$

$$g = \frac{1}{\sqrt{1 - \bar{V}^2}} \qquad (16)$$

$$\bar{t}_1 = \frac{c \cdot t_1}{R} \qquad (17)$$

$$\bar{t}'_1 = \frac{c \cdot t'_1}{R} \qquad (18)$$

$$\bar{V}_{x1} = \frac{d\bar{x}_1}{d\bar{t}_1} = - \ \bar{\omega} \cdot \ \sin(\bar{\omega} \cdot \bar{t}_1) \qquad (19)$$

$$\bar{V}_{y1} = \frac{d\bar{y}_1}{d\bar{t}_1} = \bar{\omega} \cdot \ \cos(\bar{\omega} \cdot \bar{t}_1) \qquad (20)$$

$$\bar{V}'_{x1} = \frac{d\bar{x}'_1}{d\bar{t}'_1} = \frac{\bar{V}_{x1} - \bar{V}}{1 - (\bar{V}_{x1} \cdot \bar{V})} = - \frac{[\bar{\omega} \cdot \ \sin(\bar{\omega} \cdot \bar{t}_1)] + \bar{V}}{1 + [\bar{V} \cdot \bar{\omega} \cdot \ \sin(\bar{\omega} \cdot \bar{t}_1)]} \qquad (21)$$

$$\bar{V}'_{y1} = \frac{d\bar{y}'_1}{d\bar{t}'_1} = \frac{\bar{V}_{y1}}{g \cdot [1 - (\bar{V}_{x1} \cdot \bar{V})]} = \frac{\bar{\omega} \cdot \ \cos(\bar{\omega} \cdot \bar{t}_1)}{g \cdot \{1 + [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_1)]\}} \qquad (22)$$

$$\bar{V}'_1{}^2 = \bar{V}'_{1x}{}^2 + \bar{V}'_{1y}{}^2 =$$
$$= \frac{\bar{\omega}^2 + \bar{V}^2 - (\bar{\omega}^2 \cdot \bar{V}^2) + \{1 + [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_1)]\}^2 - 1}{\{1 + [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_1)]\}^2} \qquad (23)$$

$$g'_{m1} = \frac{1}{\sqrt{1 - \bar{V}'_1{}^2}} = \frac{1 + [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_1)]}{\sqrt{(\bar{\omega}^2 \cdot \bar{V}^2) - \bar{\omega}^2 - \bar{V}^2 + 1}} \qquad (24)$$

$$\bar{P}'_{x1} = \bar{V}'_{x1} \cdot g'_{m1} = - \frac{[\bar{\omega} \cdot \ \sin(\bar{\omega} \cdot \bar{t}_1)] + \bar{V}}{\sqrt{1 - \bar{V}^2} \cdot \sqrt{1 - \bar{\omega}^2}} \qquad (25)$$

$$\bar{P}'_{y1} = \bar{V}'_{y1} \cdot g'_{m1} = \frac{\bar{\omega} \cdot \ \cos(\bar{\omega} \cdot \bar{t}_1)}{\sqrt{1 - \bar{\omega}^2}} \qquad (26)$$

$$\bar{P}'_1{}^2 = \bar{P}'_{x1}{}^2 + \bar{P}'_{y1}{}^2 = \frac{\{1 + [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_1)]\}^2}{(1 - \bar{V}^2) \cdot (1 - \bar{\omega}^2)} - 1 \qquad (27)$$

Тело 2 (Body 1)

$$x_2 = -R \cdot \ \cos(\omega \cdot t_2) \qquad (28)$$

$$y_2 = -R \cdot \sin(\omega \cdot t_2) \quad (29)$$

$$x'_2 = g \cdot [x_2 - (V \cdot t_2)] \quad (30)$$

$$y'_2 = y_2 \quad (31)$$

$$\bar{x}_2 = -\cos(\bar{\omega} \cdot \bar{t}_2) \quad (32)$$

$$\bar{y}_2 = -\sin(\bar{\omega} \cdot \bar{t}_2) \quad (33)$$

$$\bar{x}'_2 = g \cdot [\bar{x}_2 - (\bar{V} \cdot \bar{t}_2)] \quad (34)$$

$$\bar{y}'_2 = \bar{y}_2 \quad (35)$$

$$\bar{t}'_2 = g \cdot [\bar{t}_2 - (\bar{V} \cdot \bar{x}_2)] \quad (36)$$

$$\bar{x}_2 = \frac{x_2}{R} \quad (37)$$

$$\bar{y}_2 = \frac{y_2}{R} \quad (38)$$

$$\bar{x}'_2 = \frac{x'_2}{R} \quad (39)$$

$$\bar{y}'_2 = \frac{y'_2}{R} \quad (40)$$

$$\bar{t}_2 = \frac{c \cdot t_2}{R} \quad (41)$$

$$\bar{t}'_2 = \frac{c \cdot t'_2}{R} \quad (42)$$

$$\bar{V}_{x2} = \frac{d\bar{x}_2}{d\bar{t}_2} = \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2) \quad (43)$$

$$\bar{V}_{y2} = \frac{d\bar{y}_2}{d\bar{t}_2} = -\bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_2) \quad (44)$$

$$\bar{V}'_{x2} = \frac{d\bar{x}'_2}{d\bar{t}'_2} = \frac{\bar{V}_{x2} - \bar{V}}{1 - (\bar{V}_{x2} \cdot \bar{V})} = \frac{[\bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)] - \bar{V}}{1 - [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)]} \quad (45)$$

$$\bar{V}'_{y2} = \frac{d\bar{y}'_2}{d\bar{t}'_2} = \frac{\bar{V}_{y2}}{g \cdot [1 - (\bar{V}_{x2} \cdot \bar{V})]} = -\frac{\bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_2)}{g \cdot \{1 - [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)]\}} \quad (46)$$

$$\bar{V}'_2{}^2 = \bar{V}'_{2x}{}^2 + \bar{V}'_{2y}{}^2 = \\ = \frac{\bar{\omega}^2 + \bar{V}^2 - (\bar{\omega}^2 \cdot \bar{V}^2) + \{1 - [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)]\}^2 - 1}{\{1 - [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)]\}^2} \quad (47)$$

$$g'_{m2} = \frac{1}{\sqrt{1 - \bar{V}'_2{}^2}} = \frac{1 - [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)]}{\sqrt{(\bar{\omega}^2 \cdot \bar{V}^2) - \bar{\omega}^2 - \bar{V}^2 + 1}} \quad (48)$$

$$\bar{P}'_{x2} = \bar{V}'_{x2} \cdot g'_{m2} = \frac{[\bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)] - \bar{V}}{\sqrt{1 - \bar{V}^2} \cdot \sqrt{1 - \bar{\omega}^2}} \quad (49)$$

$$\bar{P}'_{y2} = \bar{V}'_{y2} \cdot g'_{m2} = -\frac{\bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_2)}{\sqrt{1 - \bar{\omega}^2}} \quad (50)$$

$$\bar{P}'_2{}^2 = \bar{P}'_{x2}{}^2 + \bar{P}'_{y2}{}^2 = \frac{\{1 - [\bar{V} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)]\}^2}{(1 - \bar{V}^2) \cdot (1 - \bar{\omega}^2)} - 1 \quad (51)$$

Система тел 1 и 2

(The system of bodies 1 and 2)

$$\bar{P}'_{x\Sigma} = \bar{P}'_{x1} + \bar{P}'_{x2} = \frac{\bar{\omega} \cdot [\sin(\bar{\omega} \cdot \bar{t}_2) - \sin(\bar{\omega} \cdot \bar{t}_1)] - 2 \cdot \bar{V}}{\sqrt{1 - \bar{V}^2} \cdot \sqrt{1 - \bar{\omega}^2}} \quad (52)$$

$$\bar{P}'_{y\Sigma} = \bar{P}'_{y1} + \bar{P}'_{y2} = \frac{\bar{\omega} \cdot [\cos(\bar{\omega} \cdot \bar{t}_1) - \cos(\bar{\omega} \cdot \bar{t}_2)]}{\sqrt{1 - \bar{\omega}^2}} \quad (53)$$

$$\bar{P}'_{\Sigma}{}^2 = \bar{P}'_{x\Sigma}{}^2 + \bar{P}'_{y\Sigma}{}^2 = \\ = \frac{\{\bar{\omega} \cdot [\sin(\bar{\omega} \cdot \bar{t}_2) - \sin(\bar{\omega} \cdot \bar{t}_1)] - 2 \cdot \bar{V}\}^2}{(1 - \bar{V}^2) \cdot (1 - \bar{\omega}^2)} \\ + \frac{\bar{\omega}^2 \cdot [\cos(\bar{\omega} \cdot \bar{t}_1) - \cos(\bar{\omega} \cdot \bar{t}_2)]^2}{(1 - \bar{\omega}^2)} \quad (54)$$

$$\tan\alpha = \frac{\bar{P}'_{y\Sigma}}{\bar{P}'_{x\Sigma}} = \frac{\{\bar{\omega} \cdot [\cos(\bar{\omega} \cdot \bar{t}_1) - \cos(\bar{\omega} \cdot \bar{t}_2)]\} \cdot \sqrt{1 - \bar{V}^2}}{\bar{\omega} \cdot [\sin(\bar{\omega} \cdot \bar{t}_2) - \sin(\bar{\omega} \cdot \bar{t}_1)] - 2 \cdot \bar{V}} \quad (55)$$

Связь между $\bar{t}_1$ и $\bar{t}_2$

(Relationship between $\bar{t}_1$ and $\bar{t}_2$)

Условие:

$$\bar{t}'_1 = \bar{t}'_2 = g \cdot [\bar{t}_1 - (\bar{V} \cdot \bar{x}_1)] = g \cdot [\bar{t}_2 - (\bar{V} \cdot \bar{x}_2)] =$$
$$= g \cdot [\bar{t}_1 - (\bar{V} \cdot \cos(\bar{\omega} \cdot \bar{t}_1))] = g \cdot [\bar{t}_2 + (\bar{V} \cdot \cos(\bar{\omega} \cdot \bar{t}_2))] \quad (56)$$

$$\bar{t}_1 - (\bar{V} \cdot \bar{x}_1) = \bar{t}_2 - (\bar{V} \cdot \bar{x}_2) \quad (57)$$

$$\bar{t}_1 - [\bar{V} \cdot \cos(\bar{\omega} \cdot \bar{t}_1)] = \bar{t}_2 + [\bar{V} \cdot \cos(\bar{\omega} \cdot \bar{t}_2)] \quad (58)$$

Нить 3: i-тая точка

i-point of the string 3

$$i = 1, 2, 3 \dots n \quad (59)$$

$$R_{1i} = R \cdot \left(\frac{1}{2 \cdot n} + \frac{i-1}{n}\right) \quad (60)$$

$$x_{1i} = R_{1i} \cdot \cos(\omega \cdot t_{1i}) \quad (61)$$

$$y_{1i} = R_{1i} \cdot \sin(\omega \cdot t_{1i}) \quad (62)$$

$$x'_{1i} = g \cdot [x_{1i} - (V \cdot t_{1i})] \quad (63)$$

$$y'_{1i} = y_{1i} \quad (64)$$

$$\bar{x}_{1i} = \frac{R_{1i}}{R} \cdot \cos(\bar{\omega} \cdot \bar{t}_{1i}) \quad (65)$$

$$\bar{y}_{1i} = \frac{R_{1i}}{R} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i}) \quad (66)$$

$$\bar{x}'_{1i} = g \cdot [\bar{x}_{1i} - (\bar{V} \cdot \bar{t}_{1i})] \quad (67)$$

$$\bar{y}'_{1i} = \bar{y}_{1i} \quad (68)$$

$$\bar{t}'_{1i} = g \cdot [\bar{t}_{1i} - (\bar{V} \cdot \bar{x}_{1i})] \quad (69)$$

$$\bar{x}_{1i} = \frac{x_{1i}}{R} \quad (70)$$

$$\bar{y}_{1i} = \frac{y_1 i}{R} \quad (71)$$

$$\bar{x}'_{1i} = \frac{x'_{1i}}{R} \quad (72)$$

$$\bar{y}'_{1i} = \frac{y'_{1i}}{R} \quad (73)$$

$$\bar{V} = \frac{V}{c} \quad (74)$$

$$\bar{\omega} = \frac{R \cdot \omega}{c} \quad (75)$$

$$g = \frac{1}{\sqrt{1 - \bar{V}^2}} \quad (76)$$

$$\bar{t}_{1i} = \frac{c \cdot t_{1i}}{R} \quad (77)$$

$$\bar{t}'_{1i} = \frac{c \cdot t'_{1i}}{R} \quad (78)$$

$$\bar{R}_{1i} = \frac{R_{1i}}{R} \quad (79)$$

$$\bar{V}_{x1i} = \frac{d\bar{x}_{1i}}{d\bar{t}_{1i}} = -\ \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i}) \quad (80)$$

$$\bar{V}_{y1i} = \frac{d\bar{y}_{1i}}{d\bar{t}_{1i}} = \bar{R}_{1i} \cdot \bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_{1i}) \quad (81)$$

$$\bar{V}'_{x1i} = \frac{d\bar{x}'_{1i}}{d\bar{t}'_{1i}} = \frac{\bar{V}_{x1i} - \bar{V}}{1 - (\bar{V}_{x1i} \cdot \bar{V})} = - \frac{[\bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})] + \bar{V}}{1 + [\bar{V} \cdot \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})]} \quad (82)$$

$$\bar{V}'_{y1i} = \frac{d\bar{y}'_{1i}}{d\bar{t}'_{1i}} = \frac{\bar{V}_{y1i}}{g \cdot [1 - (\bar{V}_{x1i} \cdot \bar{V})]} = \frac{\bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_{1i})}{g \cdot \{1 + [\bar{V} \cdot \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})]\}} \quad (83)$$

$$\bar{V}'^{\,2}_{1i} = \bar{V}'^{\,2}_{1xi} + \bar{V}'^{\,2}_{1yi} =$$
$$= \frac{\{1 + [\bar{V} \cdot \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})]\}^2 - \left[(1 - \bar{V}^2) \cdot \left(1 - \bar{\omega}^2 \cdot \bar{R}_{1i}^{\,2}\right)\right]}{\{1 + [\bar{V} \cdot \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})]\}^2} \quad (84)$$

$$g'_{m1i} = \frac{1}{\sqrt{1 - \bar{V}'^{\,2}_{1i}}} = \frac{1 + [\bar{V} \cdot \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})]}{\sqrt{1 - \bar{V}^2} \cdot \sqrt{1 - \bar{\omega}^2 \cdot \bar{R}_{1i}^{\,2}}} \quad (85)$$

$$\bar{M}_{1i} = \frac{M_{1i}}{M_o} \qquad (86)$$

$$\bar{P}'_{x1i} = \bar{M}_{1i} \cdot \bar{V}'_{x1i} \cdot g'_{m1i} = -\bar{M}_{1i} \cdot \frac{[\bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})] + \bar{V}}{\sqrt{1-\bar{V}^2} \cdot \sqrt{1-\bar{\omega}^2 \cdot \bar{R}_{1i}{}^2}} \qquad (87)$$

$$\bar{P}'_{y1i} = \bar{M}_{1i} \cdot \bar{V}'_{y1i} \cdot g'_{m1i} = \bar{M}_{1i} \cdot \frac{\bar{R}_{1i} \cdot \bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_{1i})}{\sqrt{1-\bar{\omega}^2 \cdot \bar{R}_{1i}{}^2}} \qquad (88)$$

$$\bar{P}'_{1i}{}^2 = \bar{P}'_{x1i}{}^2 + \bar{P}'_{y1i}{}^2 = \bar{M}_{1i} \cdot \frac{\{1+[\bar{V} \cdot \bar{R}_{1i} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{1i})]\}^2}{(1-\bar{V}^2) \cdot \left(1-\bar{\omega}^2 \cdot \bar{R}_{1i}{}^2\right)} - 1 \qquad (89)$$

Нить 3: j-тая точка

j-point of the string 3

$$j = 1, 2, 3 \dots n \qquad (90)$$

$$R_{2j} = R \cdot \left(\frac{1}{2 \cdot n} + \frac{j-1}{n}\right) \qquad (91)$$

$$x_{2j} = -R_{2j} \cdot \cos(\omega \cdot t_{2j}) \qquad (92)$$

$$y_{2j} = -R_{2j} \cdot \sin(\omega \cdot t_{2j}) \qquad (93)$$

$$x'_{2j} = g \cdot \left[x_{2j} - (V \cdot t_{2j})\right] \qquad (94)$$

$$y'_{2j} = y_{2j} \qquad (95)$$

$$\bar{x}_{2j} = -\frac{R_{2j}}{R} \cdot \cos(\bar{\omega} \cdot \bar{t}_{2j}) \qquad (96)$$

$$\bar{y}_{2j} = -\frac{R_{2j}}{R} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j}) \qquad (97)$$

$$\bar{x}'_{2j} = g \cdot \left[\bar{x}_{2j} - (\bar{V} \cdot \bar{t}_{2j})\right] \qquad (98)$$

$$\bar{y}'_{2j} = \bar{y}_{2j} \qquad (99)$$

$$\bar{t}'_{2j} = g \cdot \left[\bar{t}_{2j} - (\bar{V} \cdot \bar{x}_{2j})\right] \qquad (100)$$

$$\bar{x}_{2j} = \frac{x_{2j}}{R} \qquad (101)$$

$$\bar{y}_{2j} = \frac{y_{2j}}{R} \qquad (102)$$

$$\bar{x}'_{2j} = \frac{x'_{2j}}{R} \qquad (103)$$

$$\bar{y}'_{2j} = \frac{y'_{2j}}{R} \qquad (104)$$

$$\bar{t}_{2j} = \frac{c \cdot t_{2j}}{R} \qquad (105)$$

$$\bar{t}'_{2j} = \frac{c \cdot t'_{2j}}{R} \qquad (106)$$

$$\bar{R}_{2j} = \frac{R_{2j}}{R} \qquad (107)$$

$$\bar{V}_{x2j} = \frac{d\bar{x}_{2j}}{d\bar{t}_{2j}} = \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j}) \qquad (108)$$

$$\bar{V}_{y2j} = \frac{d\bar{y}_{2j}}{d\bar{t}_{2j}} = -\bar{R}_{2j} \cdot \bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_{2j}) \qquad (109)$$

$$\bar{V}'_{x2j} = \frac{d\bar{x}'_{2j}}{d\bar{t}'_{2j}} = \frac{\bar{V}_{x2j} - \bar{V}}{1 - (\bar{V}_{x2j} \cdot \bar{V})} = \frac{\left[\bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right] - \bar{V}}{1 - \left[\bar{V} \cdot \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right]} \qquad (110)$$

$$\bar{V}'_{y2j} = \frac{d\bar{y}'_{2j}}{d\bar{t}'_{2j}} = \frac{\bar{V}_{y2j}}{g \cdot \left[1 - (\bar{V}_{x2j} \cdot \bar{V})\right]}$$

$$= -\frac{\bar{R}_{2j} \cdot \bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_{2j})}{g \cdot \left\{1 - \left[\bar{V} \cdot \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right]\right\}} \qquad (111)$$

$$\bar{V}'_{2j}{}^{2} = \bar{V}'_{2xj}{}^{2} + \bar{V}'_{2yj}{}^{2} =$$

$$= \frac{\left\{1 - \left[\bar{V} \cdot \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right]\right\}^2 - \left[(1 - \bar{V}^2) \cdot \left(1 - \bar{\omega}^2 \cdot \bar{R}_{2j}{}^{2}\right)\right]}{\left\{1 - \left[\bar{V} \cdot \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right]\right\}^2} \qquad (112)$$

$$g'_{m2j} = \frac{1}{\sqrt{1 - \bar{V}'_2{}^{2}}} = \frac{1 - \left[\bar{V} \cdot \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_2)\right]}{\sqrt{1 - \bar{V}^2} \cdot \sqrt{1 - \bar{\omega}^2 \cdot \bar{R}_{2j}{}^{2}}} \qquad (113)$$

$$\bar{M}_{2j} = \frac{M_{2j}}{M_o} \qquad (114)$$

$$\bar{P}'_{x2j} = \bar{M}_{2j} \cdot \bar{V}'_{x2j} \cdot g'_{m2j} = \bar{M}_{2j} \cdot \frac{\left[\bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right] - \bar{V}}{\sqrt{1-\bar{V}^2} \cdot \sqrt{1-\bar{\omega}^2 \cdot \bar{R}_{2j}{}^2}} \qquad (115)$$

$$\bar{P}'_{y2j} = \bar{M}_{2j} \cdot \bar{V}'_{y2j} \cdot g'_{m2j} = -\bar{M}_{2j} \cdot \frac{\bar{R}_{2j} \cdot \bar{\omega} \cdot \cos(\bar{\omega} \cdot \bar{t}_{2j})}{\sqrt{1-\bar{\omega}^2 \cdot \bar{R}_{2j}{}^2}} \qquad (116)$$

$$\bar{P}'_{2j}{}^2 = \bar{P}'_{x2j}{}^2 + \bar{P}'_{y2j}{}^2 = \frac{\left\{1-\left[\bar{V} \cdot \bar{R}_{2j} \cdot \bar{\omega} \cdot \sin(\bar{\omega} \cdot \bar{t}_{2j})\right]\right\}^2}{(1-\bar{V}^2) \cdot \left(1-\bar{\omega}^2 \cdot \bar{R}_{2j}{}^2\right)} - 1 \qquad (117)$$

Система тел 1 и 2 и нить 3

(The system of bodies 1 and 2 and the string 3)

$$\bar{P}'_{x\Sigma} = \bar{P}'_{x1} + \bar{P}'_{x2} + \sum \bar{P}'_{x1i} + \sum \bar{P}'_{x2j} \qquad (118)$$

$$\bar{P}'_{y\Sigma} = \bar{P}'_{y1} + \bar{P}'_{y2} + \sum \bar{P}'_{y1i} + \sum \bar{P}'_{y2j} \qquad (119)$$

$$\bar{P}'_{\Sigma}{}^2 = \bar{P}'_{x\Sigma}{}^2 + \bar{P}'_{y\Sigma}{}^2 \qquad (120)$$

$$\tan\alpha = \frac{\bar{P}'_{y\Sigma}}{\bar{P}'_{x\Sigma}} \qquad (121)$$

Связь между $\bar{t}_1$, $\bar{t}_{1i}$, $\bar{t}_2$ и $\bar{t}_{2j}$

(Relationship between $\bar{t}_1$, $\bar{t}_{1i}$, $\bar{t}_2$ and $\bar{t}_{2j}$)

Условие:

$$\begin{aligned}
\bar{t}'_1 = \bar{t}'_2 = \bar{t}'_{1i} = \bar{t}'_{2j} &= g \cdot [\bar{t}_1 - (\bar{V} \cdot \bar{x}_1)] = g \cdot [\bar{t}_2 - (\bar{V} \cdot \bar{x}_2)] = \\
&= g \cdot [\bar{t}_{1i} - (\bar{V} \cdot \bar{x}_{1i})] = g\left[\bar{t}_{2j} - (\bar{V} \cdot \bar{x}_{2j})\right] \\
&= g \cdot [\bar{t}_1 - (\bar{V} \cdot \cos(\bar{\omega} \cdot \bar{t}_1))] = g \cdot [\bar{t}_2 + (\bar{V} \cdot \cos(\bar{\omega} \cdot \bar{t}_2))] \\
&= g \cdot [\bar{t}_{1i} - (\bar{V} \cdot \bar{R}_{1i} \cdot \cos(\bar{\omega} \cdot \bar{t}_{1i}))] \\
&= g \cdot \left[\bar{t}_{2j} + (\bar{V} \cdot \bar{R}_{2j} \cdot \cos(\bar{\omega} \cdot \bar{t}_{2j}))\right] \qquad (122)
\end{aligned}$$

$$\bar{t}_1 - (\bar{V} \cdot \bar{x}_1) = \bar{t}_2 - (\bar{V} \cdot \bar{x}_2) = \bar{t}_{1i} - (\bar{V} \cdot \bar{x}_{1i}) = \bar{t}_{2j} - (\bar{V} \cdot \bar{x}_{2j}) \quad (123)$$

$$\bar{t}_1 - [\bar{V} \cdot \cos(\bar{\varpi} \cdot \bar{t}_1)] = \bar{t}_2 + [\bar{V} \cdot \cos(\bar{\varpi} \cdot \bar{t}_2)] = \bar{t}_{1i} - (\bar{V} \cdot \bar{R}_{1i} \cdot \cos(\bar{\varpi} \cdot \bar{t}_{1i})) = \bar{t}_{2j} + (\bar{V} \cdot \bar{R}_{2j} \cdot \cos(\bar{\varpi} \cdot \bar{t}_{2j})) \quad (124)$$