

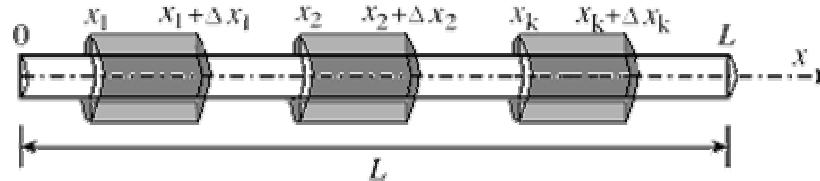
Nanobare cu elemente disipative

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Nanobara cu elemente externe disipative

$$\frac{\partial}{\partial x^2} \left(J(x) \frac{\partial^2 w}{\partial x^2} \right) + \rho A \left(\frac{\partial w}{\partial t} \right)^2 + \Upsilon = 0 \quad \Upsilon = \sum_{i=1}^k \int_{x_i}^{x_i + \Delta x_i} \int_{-\infty}^t C(x, \xi, t - \tau) \frac{\partial w(\xi, \tau)}{\partial t} d\tau d\xi.$$

$$C(x, \xi, t - \tau) = H(x)c(x - \xi)g(t - \tau). \quad C(x, \xi, t - \tau) = H(x)c(x - \xi)\delta(t - \tau).$$

$$c(x - \xi) = \frac{\alpha}{2} \exp(-\alpha |x - \xi|), \quad c(x - \xi) = \frac{\alpha}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}\alpha^2(x - \xi)^2\right).$$

$$\text{Histerezis temporal} \quad C(x, \xi, t - \tau) = H(x)\delta(x - \xi)g(t - \tau).$$

$$g(t - \tau) = g_0 \mu \exp(-\mu(t - \tau))$$

$$\text{Histerezis spatial} \quad C(x, \xi, t - \tau) = H(x)c(x - \xi)\delta(t - \tau).$$

$$c(x - \xi) = \frac{\alpha}{2} \exp(-\alpha |x - \xi|),$$

$$c(x - \xi) = \frac{\alpha}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}\alpha^2(x - \xi)^2\right).$$

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Multumim pe aceasta cale CNCSIS PNII idei pentru sprijin financiar prin grantul nr.106/2007, cod 247/2007.



TABEL 1

Model	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Caz 1					
1	-4.74 ± 20.151	-0.26 ± 71.421	-0.045 ± 160.981	-0.017 ± 287.311	-0.0050 ± 451.671
2	-4.91 ± 20.221	-0.29 ± 71.661	-0.051 ± 160.531	-0.019 ± 287.761	-0.0051 ± 451.731
3	-4.75 ± 20.161	-0.23 ± 71.091	-0.038 ± 160.511	-0.013 ± 287.981	-0.0011 ± 451.701
4	-4.43 ± 20.391	-0.15 ± 71.101	-0.028 ± 160.041	-0.008 ± 287.061	-0.0012 ± 451.741
Caz 2					
1	-9.97 ± 16.991	-3.79 ± 72.441	-3.03 ± 152.661	-3.57 ± 283.211	-2.59 ± 449.831
2	-10.52 ± 16.941	-4.28 ± 72.441	-3.32 ± 152.771	-4.04 ± 283.231	-2.64 ± 449.471
3	-10.05 ± 16.841	-3.36 ± 72.481	-2.51 ± 152.761	-2.73 ± 283.211	-2.66 ± 449.741
4	-9.12 ± 16.871	-2.28 ± 72.591	-1.89 ± 152.581	-1.76 ± 283.291	-2.60 ± 449.821
Caz 3					
1	-3.38 ± 18.191	-1.17 ± 60.461	-1.13 ± 144.281	-0.33 ± 165.451	-0.059 ± 346.031
2	-3.52 ± 18.241	-1.28 ± 60.581	-1.19 ± 144.581	-0.48 ± 165.471	-0.064 ± 346.471
3	-2.15 ± 18.111	-1.09 ± 60.391	-1.11 ± 144.921	-0.13 ± 165.831	-0.066 ± 346.741
4	-2.12 ± 18.241	-0.67 ± 60.491	-1.10 ± 144.751	-0.12 ± 165.591	-0.060 ± 346.821

TABEL 2

Model	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
Caz 1					
1	-4.82 ± 14.571	-0.32 ± 63.511	-0.046 ± 143.561	-0.018 ± 280.381	-0.0052 ± 413.33
2	-4.99 ± 14.991	-0.39 ± 63.601	-0.053 ± 143.631	-0.019 ± 280.421	-0.0054 ± 413.37
3	-4.91 ± 14.601	-0.33 ± 63.321	-0.039 ± 143.901	-0.015 ± 280.331	-0.0013 ± 413.11
4	-4.65 ± 14.861	-0.27 ± 63.191	-0.029 ± 143.421	-0.009 ± 280.251	-0.0012 ± 413.30
Caz 2					
1	-10.87 ± 15.091	-3.99 ± 70.541	-3.05 ± 142.461	-2.58 ± 270.061	-2.60 ± 423.031
2	-10.76 ± 15.221	-4.37 ± 70.551	-3.39 ± 142.451	-3.17 ± 270.001	-2.65 ± 423.221
3	-10.35 ± 15.131	-3.66 ± 70.681	-2.57 ± 142.771	-2.25 ± 270.121	-2.67 ± 423.331
4	-9.40 ± 15.531	-2.58 ± 70.681	-1.91 ± 142.781	-1.67 ± 270.041	-2.65 ± 423.301
Caz 3					
1	-3.41 ± 10.631	-1.19 ± 55.261	-1.17 ± 140.561	-0.37 ± 250.581	-0.077 ± 417.241
2	-3.59 ± 10.921	-1.33 ± 55.561	-1.22 ± 140.851	-0.51 ± 250.371	-0.079 ± 417.381
3	-2.33 ± 10.761	-1.22 ± 55.551	-1.20 ± 140.921	-0.33 ± 250.711	-0.071 ± 417.761
4	-2.23 ± 10.451	-0.79 ± 55.431	-0.49 ± 140.751	-0.32 ± 250.541	-0.070 ± 417.771

TABEL 3

Locatie elemente externe disipative HDPE (caz 1, model 1).

	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5
$k_p = 1$					
	-5.87 ± 744.551	-4.96 ± 1493.491	-3.24 ± 1873.571	-2.37 ± 2637.391	-0.52 ± 3553.461
x_1	0.5	0.5	0.23 and 0.67	0.155 and 0.745	0.11 and 0.79
$k_p = 2$					
	-5.22 ± 699.321	-4.93 ± 1292.421	-3.87 ± 2073.571	-2.59 ± 2537.501	-2.52 ± 3053.601
x_1	0.055 and 0.845	0.09 and 0.81	0.235 and 0.665	0.15 and 0.75	0.11 and 0.79
x_2	0.105 and 0.795	0.125 and 0.775	0.275 and 0.625	0.285 and 0.615	0.21 and 0.69