VIBRATIONS INFLUENCE ON THE ACCELERATION FIELD OF A THIN PLANE PLATE WITH LINEAR ELASTIC BEHAVIOUR

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The paper presents, in the beginning, the mechanical model with an infinite number degrees of liberty of the determined vibrations of the carriage body of a motor vehicle. The mathematical model can be obtained by using Hamilton's variational principle [1]. Then, it is determined the dynamical response for the vibrations of a thin plane plate Figure 1, in boundary conditions corresponding to the simple bearing, under the influence of the elements of a roto-translations. Keeping account by the accelerations field expresion obtained in [3] it results, in a case more generally, the accelerations field under function shape:

$$a_P(x_1,x_2,t) =$$

$$= \frac{4}{L_1L_2\pi^2}\sum_{n=1}^{\infty}\sum_{m=1}^{\infty}\frac{1}{nm}\cdot\left\{-\frac{\pi^2 cnm g_s^{**}(n,m)\sqrt{\left(\alpha_n^2+\beta_m^2\right)^2-c^2\omega^2}}{c^2}\sin\left[\frac{1}{c}\sqrt{\left(\alpha_n^2+\beta_m^2\right)^2-c^2\omega^2}\cdot t\right]-\right.$$

$$-\frac{\pi^2 nm f_s^{**}(n,m)\left[\left(\alpha_n^2+\beta_m^2\right)^2-c^2\omega^2\right]+c^2L_1L_2a_0\left[1+(-1)^{n+1}\right]\cdot\left[1+(-1)^{m+1}\right]}{c^2}\cdot$$

$$\left.\cdot\cos\left[\frac{1}{c}\sqrt{\left(\alpha_n^2+\beta_m^2\right)^2-c^2\omega^2}\cdot t\right]\right\}\sin(\alpha_n x_1)\sin(\beta_m x_2)$$

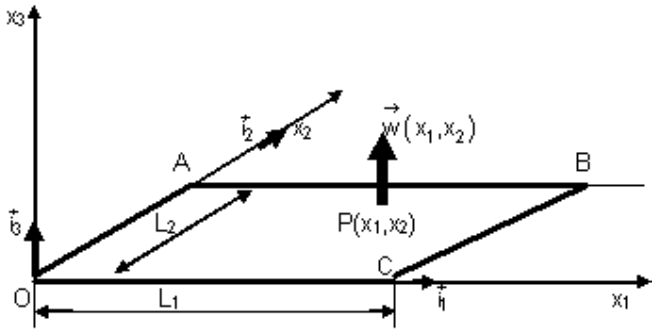

Figure 1. Plane plate linear elastic

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