

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

CUȚĂ Petre, BĂGNARU Dan Gheorghe

University of Craiova

bagnaru@yahoo.com; sami200768@yahoo.com

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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:

$$a_p(x_1, x_2, t) = \frac{4}{L_1 L_2 \pi^2} \sum_{n=1}^{\infty} \sum_{m=1}^{\infty} \frac{1}{nm} \cdot \left\{ \frac{\pi^2 c n m g_s^{**}(n, m) \sqrt{(\alpha_n^2 + \beta_m^2)^2 - c^2 \omega^2}}{c^2} \sin \left[\frac{1}{c} \sqrt{(\alpha_n^2 + \beta_m^2)^2 - c^2 \omega^2} \cdot t \right] - \frac{\pi^2 n m f_s^{**}(n, m) \left[(\alpha_n^2 + \beta_m^2)^2 - c^2 \omega^2 \right] + c^2 L_1 L_2 a_0 \left[1 + (-1)^{n+1} \right] \cdot \left[1 + (-1)^{m+1} \right]}{c^2} \cdot \cos \left[\frac{1}{c} \sqrt{(\alpha_n^2 + \beta_m^2)^2 - c^2 \omega^2} \cdot t \right] \right\} \sin(\alpha_n x_1) \sin(\beta_m x_2)$$

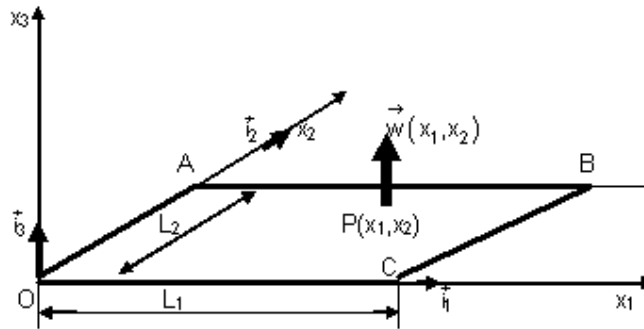


Figure 1. Plane plate linear elastic

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