THE SHEAR CORRECTION COEFFICIENT IN THE VISCOELASTIC MINDLIN-TIMOSHENKO THIN PLATE MODEL

DÁVID PANCZA

Department of Mathematics, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Bratislava, Slovak Republic
pancza@kmat.elf.stuba.sk

The Mindlin-Timoshenko Model allows us to describe separately the vertical motion (bending) of a viscoelastic thin plate by an operator equation

$$\mathcal{K}(W'', V) + \langle \mathcal{A}(0)W, V \rangle + \langle \mathcal{A}' * W, V \rangle = \mathcal{F}(V) + \mathcal{G}(V).$$

The bilinear form $\mathcal{A}$ can be written as a sum of two members which are differently dependendent on the thickness h of the plate:

$$\mathcal{A} = h\mathcal{A}_1 + h^3\mathcal{A}_3.$$

To correct the inexactness of the MT model, a factor k called the shear correction coefficient is introduced into $\mathcal{A}$:

$$\mathcal{A} = kh\mathcal{A}_1 + h^3\mathcal{A}_3.$$

The term $kh\mathcal{A}$ plays here the role of a penalty term. We shall deal with the properties of the MT model in the special cases of $k \to 0$ and $k \to \infty$.