



Finite element modelling of wave propagation in layered structures

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To date, two main approaches have been used with respect to investigation of wave propagation in layered structures. The implicit method requires the use of an equivalent homogenised continuum with non-direct presence of the joints, whereas the explicit approach implies conventional detailed modelling of each layer. In this paper, a finite element model of several isotropic layers has been analysed.

The considered model comprises five horizontal layers pinned at the ends. The impulse loading is applied to the middle of the top layer. The process of elastic wave propagation in the directions parallel and perpendicular to the layering has been analysed by means of FEM. It should be noted that the influence of Lamb waves is out of scope of this paper.

The previously implemented implicit method showed that in the case of sliding layers localisation of waves occurs in the directions normal and parallel to layering. The final element analysis confirmed the localisation phenomenon for low friction between the layers.