

Asymptotics of eigenvalues for a class of spectral problems in multi-structures

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The talk presents asymptotic approximations to solutions of spectral problems for the Lamé operator in 1D-3D multi-structures, i.e. regions consisting of a 3D solid linked to thin rods. The small parameter is the normalized thickness of thin rods. The model is reduced to analysis of several types of canonical model problems independent of the small parameter, this includes the boundary layer in the junction regions. Closed form analytic representations are obtained for the first eigenvalues of the corresponding spectral problems, the approximates are obtained as solutions of finite dimensional algebraic problems. The talk is based on the results of the joint work with V.Maz'ya and V.Kozlov.