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**Asymptotic modeling of the elastodynamics of a multi-structure.** (English) Zbl 0777.73033  
Asymptotic Anal. 6, No. 1, 73-108 (1992).

**Summary:** We consider a structure consisting of two parts: a three-dimensional linearly elastic body and a linearly elastic plate. The plate is inserted into the three-dimensional body. We perform an asymptotic analysis of the time-dependent behavior of the structure during the time-interval  $[0, T]$  when the thickness of the plate goes to zero. Under specific assumptions on the data (Lamé constants, mass densities, loads), we establish the existence of a limit problem. This limit problem is a system of coupled partial differential equations posed over a three-dimensional body with a slit and the middle surface of the plate. Strong convergence in  $L^2(0, T; H^1)$  of the time-dependent displacements (with appropriate scaling) is proved.

**MSC:**

[74H45](#) Vibrations in dynamical problems in solid mechanics  
[74K20](#) Plates  
[74B05](#) Classical linear elasticity

Cited in 4 Documents

**Keywords:**

linearly elastic body; linearly elastic plate; existence; limit problem; convergence