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BOUNDARY VALUE PROBLEMS FOR ELASTIC BODIES WITH SINGULAR BOUNDARIES

The paper deals with elastic prismatic shell or beam type three-dimensional bodies. The boundary of the projection of the shell is a Lipschitz curve while, in general, a boundary of the body is not a Lipschitz surface. Boundary value problems (BVPs) of three-dimentional theory of elastic bodies with a Lipschitz boundary are studied completely (see e.g. [1], [2]). The main purpose of this paper is to study BVPs for bodies under consideration (especially for the so called cusped prismatic shells and beams [3], [4]) by means of approximate two- and one-dimensional hierarchic models which was constructed by I. Vekua in case of shells [5] and then developed by many authors (for references see [4]). The presented results are mostly obtained within the framework of NATO SCIENCE PROGRAMME for 2000 and 2001 (NATO PST. CLG. 976426/5437, Principal investigators: W. L. Wendland, G. Jaiani, D. Natroshvili, S. Kharibegashvili). The existence and uniqueness theorems for approximate models, in appropriate weighted Sobolev spaces are proved for the admissible Dirichlet, Keldysh's type, and weighted BVPs. The convergence of the approximate solutions of some BVPs to the solution of the original three-dimentional problem is established in the case of a Lipschitz boundary.

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