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"Shallow" shells in curvilinear coordinates. (Coques "faiblement courbées" en coordonnées curvilignes.) (French) Zbl 0862.73036

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Summary: We consider a family of linearly elastic shells that are "shallow" in a sense specified in the note. We show that, if the applied forces are of a specific order of magnitude, the covariant components of the displacement field, once properly scaled, converge in H^1 when the thickness of the shell approaches zero. Moreover, the limits are completely determined by the solution of a two-dimensional problem that constitutes a model of "shallow" shells in curvilinear coordinates. This new model complements the model previously obtained in Cartesian coordinates by the last two authors.

MSC:

74K15 Membranes
35Q72 Other PDE from mechanics (MSC2000)

Keywords:

H(1)-convergence; covariant components of displacement field; linearly elastic shells; two-dimensional problem