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**A model problem for boundary layers of thin elastic shells.** (English) Zbl 1004.74050  
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Authors' abstract: We consider a model problem (with constant coefficients and simplified geometry) for boundary layer phenomena which appear in thin shell theory as the relative thickness  $\varepsilon$  of the shell tends to zero. For  $\varepsilon = 0$  our problem is parabolic, for  $\varepsilon > 0$  the equations can be considered as a model of developable surfaces. Boundary layers along and across the characteristics have very different structures. There also appear internal layers associated with the propagation of singularities along the characteristics. The layers along the characteristics have a special structure involving subspaces; the corresponding Lagrange multipliers are exhibited. Numerical experiments show the advantage of adaptive meshes in these problems.

Reviewer: Oldřich John (Praha)

**MSC:**

**74K25** Shells  
**74G10** Analytic approximation of solutions (perturbation methods, asymptotic methods, series, etc.) of equilibrium problems in solid mechanics  
**35Q72** Other PDE from mechanics (MSC2000)

Cited in 4 Documents

**Keywords:**

thin shell theory; boundary layer; developable surfaces; propagation of singularities; characteristics; Lagrange multipliers

**Full Text:** [DOI](#) [Link](#) [EuDML](#)

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