

Continuity Conditions in Elastic Shells with Phase Transformation

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We develop the dynamically and kinematically exact non-linear theory of elastic shells with an account of phase transformation of the shell material. Independent field variables of our model are the translation vector, the rotation tensor, and the position vector of the curvilinear phase interface, all defined on the undeformed shell base surface. We formulate the equilibrium boundary value problem through the variational principle of the stationary total potential energy. In particular, new dynamic continuity conditions are derived at the phase interface. Special forms of the continuity conditions are given at the coherent and incoherent interface curves. The results are illustrated on examples of phase transition in an infinite plate with a circular hole, a simply supported circular plate and a circular cylindrical shell.

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