The incompressible limit in 3d nonlinear isotropic elastodynamics

Thomas C. Sideris
University of California, Santa Barbara

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Long time solutions of the equations of motion for 3d isotropic elastic materials will be constructed, with lifespan proportional to the sound speed, in the case of small initial displacements from a suitable equilibrium. In the limit as this parameter tends to infinity these solutions will be shown to converge to a global solution of the corresponding incompressible equations. The existence proof combines energy methods, dispersive estimates, and the special null structure of shear waves.