

Meeting: 1003, Atlanta, Georgia, SS 27A, AMS-SIAM Special Session on Analysis and Applications in Nonlinear Partial Differential Equations, I

1003-35-761 **Thomas C. Sideris** and **Becca Thomases*** (thomases@cims.nyu.edu), Courant Institute of Mathematical Sciences, 251 Mercer St., New York, NY 10003. *Global existence for 3D incompressible isotropic elastodynamics via the incompressible limit.*

The existence of global-in-time classical solutions to the Cauchy problem for incompressible nonlinear isotropic elastodynamics for small initial displacements is proved. Solutions are constructed via approximation by slightly compressible materials. The energy for the approximate solutions remains uniformly bounded on a time scale which goes to infinity as the material approaches incompressibility. A necessary component to the long time existence of the approximating solution is a null or linear degeneracy condition, inherent in the isotropic case, which limits the quadratic interaction of the shear waves. The proof combines energy and decay estimates based on commuting vector fields and a compactness argument. (Received September 29, 2004)