
Analytic Consequences of Incompressibility

STUART S. ANTMAN
Institute for Physical Science & Technology
University of Maryland, USA
E-mail: `ssa@math.umd.edu`

Many deformable solids, like rubber and living tissue, are effectively incompressible. This means that the Jacobian determinants of all their deformations must be everywhere equal to 1. This talk will show by simple examples that the quasilinear partial differential equations governing the motion of incompressible bodies are much more complicated than those governing the motion of compressible bodies (whose deformations need only preserve orientation), but have solutions with far more regularity. The role of incompressibility will be related to the question of constructing invariant dissipative mechanisms for hyperbolic conservation laws.