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John P. Wilber* (john.wilber@math.tamu.edu), J. Patrick Wilber, Dept. of Mathematics, Texas A&M University, College Station, TX 77843-3368, and **Stuart S Antman**. *Global Attractors for a Degenerate Equation from Viscoelasticity*.

We study several problems for the forced motion of light, uniform, nonlinearly viscoelastic bodies carrying heavy attachments. Such motions are modeled by parabolic-hyperbolic partial differential equations with dynamical boundary conditions. A detailed qualitative analysis of these equations is beyond current mathematical methods; instead, we obtain a ‘reduced’ problem for such motions by setting the ratio of inertia of the viscoelastic body to the inertia of the attachment equal to zero. Using a novel combination of infinite-dimensional dynamical-systems theory and of classical phase-plane methods, we prove that the degenerate partial differential equation of the reduced problem has a global attractor and that this attractor is contained in an invariant two-dimensional manifold on which solutions are governed by the classical ordinary differential equation for the forced motion of a particle on a massless spring. (Received July 14, 2000)