1025-35-245 **Viorel Barbu** and **Zoran Grujic*** (zg7c@virginia.edu), Department of Mathematics, Kerchof Hall, University of Virginia, Charlottesville, VA 22903, and **Irena Lasiecka** and **Amjad Tuffaha**.
Nonlinear fluid-structure interaction in 3D.

Existence theory of global-in-time energy-level weak solutions to a nonlinear fluid-structure interaction model governed by the 3D Navier-Stokes equations coupled with the linear elastic wave equation will be presented. The interaction takes place via an interface–the boundary of the elastic solid immersed in the fluid–and is realized through the continuity of both the velocities and the normal components of the stress tensors across the interface. The essential difficulty is that traces of the elastic component are a priori not well-defined in the setting of the energy-level spaces [the classical trace theory is insufficient], and only after a careful microlocal analysis argument a natural variational formulation is possible. In addition, the aforementioned solutions are shown to be smooth [locally-in-time] assuming a natural compatibility condition and smooth data. (Received January 23, 2007)