

Well-posedness of the equations governing the motion of a fluid-filled elastic solid

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I will present some results concerning the existence of solutions to the equations governing the motion of an elastic solid with an interior cavity completely filled by a viscous incompressible fluid. The equations of motion are the Navier equations of linear elasticity for the solid, and the Navier-Stokes equations for the fluid. Continuity of stresses and velocities are imposed at the fluid-solid interface, and a zero-traction condition is imposed at the other free boundary of the solid. After demonstrating the existence of local (in time) strong solutions to the governing equations, we will discuss current challenges related to the existence of global solutions and their stability.