Existence for a Linearized Steady-State Fluid-Nonlinear Elasticity Interaction

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A linearized steady-state three-dimensional fluid-structure interaction is considered and its solvability is studied. The linearization that we work with has new features, including the presence of the curvature terms on the common interface. These new extra terms, coming from the geometrical aspect of the problem, are critical for a correct physical interpretation of the fluid-structure coupling. We prove that the linearization has unique solution.