

A conditional no-contact result of compressible fluids and elastic plates in 2D

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Abstract

We consider the interaction of a compressible fluid with a flexible plate in two space dimensions. The fluid is described by the Navier-Stokes equations in a domain that is changing in accordance with the motion of the structure. The displacement of the latter evolves according to a beam equation. Both are coupled through kinematic boundary conditions and the balance of forces. We prove that for any weak solution to the coupled system, which satisfies certain additional regularity requirements, no contact occurs between the elastic wall and the bottom of the fluid cavity.

This is a joint work with Dominic Breit.

Keywords: Compressible fluids Elastic plates Fluid-structure interaction Contact problem.