

# Regularity for a perfect elastic beam interacting with the Navier-Stokes equations

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We are interested in the interaction of a viscous incompressible fluid with an elastic structure, where the structure is located on a part of the fluid boundary. It reacts to the surface forces induced by the fluid and deforms the reference domain  $\Omega$  to  $\Omega_\eta$ . The fluid equations are coupled with the structure via the kinematic condition and the action-reaction principle on the interface. We consider a 1D perfectly elastic plate, deforming vertically in flat case, interacts with 2D Navier-Stokes equations, which thereby gives a hyperbolic evolution. We show the new regularity result for this parabolic-hyperbolic coupled system. It turns out that the "parabolic effect" of the fluid suffices to regularize the solution to the coupled fluid-structure system which is previously known for the Navier-Stokes equations in fixed domains.

This is a joint work with S. Schwarzacher (Uppsala University).