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*On the analysis of fluid-solid interactions*

I will present a Saint-Venant system of equations for laminar shallow water, which describes the interaction of a viscous and incompressible fluid interacting with a floating rigid body. The governing fluid equations resemble the compressible Navier-Stokes equations with a particular choice of equation of state. Following previous work established by Feireisl on the existence of global-in-time weak solutions in the presence of a non-degenerate viscosity term, I will discuss the general approach of passing to the limit of Faedo-Galerkin solutions of artificially regularised equations using a compactness argument. In particular, following a careful analysis similar to Vasseur and Yu, I will provide an overview of our proof of the existence of weak solutions. I will explain how a jump discontinuity in the height of the fluid domain, when interacting with a partially immersed floating solid, presents an obstacle in proving the global existence of weak solutions. This talk is on joint work with Giusy Mazzone.