

Measure-valued solutions and weak-strong uniqueness for the incompressible inviscid fluid-rigid body interaction

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Abstract

We consider a coupled system of partial and ordinary differential equations describing the interaction between an incompressible inviscid fluid and a rigid body moving freely inside the fluid. We prove the existence of measure-valued solutions which is generated by the vanishing viscosity limit of incompressible fluid-rigid body interaction system under some physically constitutive relations. Moreover, we show that the measure-valued solution coincides with strong solution on the interval of its existence. This relies on the weak-strong uniqueness analysis. This is the first result of an existence of measure-valued solution and weak-strong uniqueness in measure-valued sense in the case of inviscid fluid-structure interaction.