Mathematics > Analysis of PDEs

On the inviscid limit of the system "viscous incompressible fluid + rigid body" with the Navier conditions

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In this paper we consider the inviscid limit for the system "viscous incompressible fluid + rigid body" in $\R^{3}$ when some Navier slip conditions are prescribed on the body's boundary. We prove the convergence in the energy space of weak solutions "\`a la Leray" to smooth solutions of the system "inviscid incompressible fluid + rigid body" as the viscosity goes to zero. Moreover we show that the rate of convergence is optimal with respect to the viscosity and that the solid translation and rotation velocities converge in the Sobolev space $H^1 (0,T)$, where T denotes the lifetime of the smooth solution of the inviscid system.

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