The Oberbeck-Boussinesq approximation in critical spaces

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Abstract

This talk is devoted to the study of the so called Oberbeck-Boussinesq approximation for compressible viscous perfect gases in the whole three-dimensional space. Both the cases of fluids with positive heat conductivity and zero conductivity are considered. For small perturbations of a constant equilibrium, we establish the global existence of unique strong solutions in a critical regularity functional framework. Next, taking advantage of Strichartz estimates for the associated system of acoustic waves, and of uniform estimates with respect to the Mach number, we obtain all-time convergence to the Boussinesq system.