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Incompressible two-phase flows: well-posedness for the AGG model.

The Diffuse Interface theory is nowadays widely employed in Fluid Mechanics to describe two-phase flows. This approach combines in a unified framework the concept of transition interface with the energy-based formalism from thermodynamics and statistical mechanics. In the last years, particular interest has been devoted to theoretical and numerical studies of different DI models for mixtures of two incompressible fluids with different densities. Among these systems, the Abels-Garcke-Grün (AGG) model consists in a Navier-Stokes-Cahn-Hilliard type system, which is characterized by concentration-dependent density and viscosity, and an additional flux term due to concentration diffusion at the interface. In literature the analysis of the AGG has been focused so far on the existence of weak solutions. In this talk I will present some recent results concerning the existence and uniqueness of strong solutions in two dimensions. (Received August 01, 2020)