

Long term behavior of binary fluid mixture flows

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September 4, 2008

Abstract

The quenching of a system from a disordered phase into an ordered one produces a time dependent growth process of ordered regions. The evolution of these regions is the subject of phase ordering dynamics. In the late 1950's, Cahn and Hilliard, were among the first to address these questions. In particular, they investigated behavior of binary alloys. Similar phenomena occur in the phase separation of binary fluids, that is, fluids composed by either two phases of the same chemical species, or phases of different composition. In this case, however, the phenomenology is much more complicated because of the interplay between the phase separation stage and the fluid dynamics. In this talk, a model for the study of incompressible two-phase fluid flows, such as the mixing of two fluids in a driven cavity, or the spinodal decomposition under shear is considered.