

Nonlinear Stability of a Cylindrical Interface with Mass and Heat Transfer

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The nonlinear Rayleigh-Taylor stability of a cylindrical interface between vapor and the liquid phases of a fluid is studied when the phases are enclosed between two cylindrical surfaces coaxial with the interface, and when there is mass and heat transfer across the interface. The method of multiple time scale expansion is used for the investigation. A simple nondimensional parameter is found to characterize the stability of the system. Using this parameter, the region of stability is displayed graphically.

Key words: Rayleigh-Taylor Stability; Mass and Heat Transfer; Cylindrical Interface.