

ON STATIONARY AND NONSTATIONARY VISCOUS TWO-FLUID FLOWS

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Viscous two-fluid flows arise e.g. in different kinds of coating processes. Frequently, the corresponding mathematical models represent free boundary value problems or time-dependent free boundary value problems for the two-dimensional Navier-Stokes equations in unbounded domains. In the first part of the talk the solvability of associated stationary problems is shortly discussed and former results are recalled. Particular attention is given to fluid motions in geometrical distorted channels or down inclined planes.

In the second part of the talk the time-dependent free boundary value problems are investigated. The model of the evolution of a viscous two-fluid flow down an inclined plane is presented together with some first results on the existence and uniqueness of solutions.