Asymptotic behavior of trembling fluids

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Abstract

A general problem modeling trembling fluids with applications in electro, magneto or thermo-rheological fluids is consider in this talk. The fluid flow is governed by the generalized Navier-Stokes equations with a variable q–structure. We prove that the solutions of the associated initial and boundary-value problem extinct in a finite time as long as the trembling fluid remains in the pseudo-plastic zone. For trembling fluids strictly confined to the dilatant zone or that can cross the Newtonian barrier and eventually go back, we study the large time behavior of the solutions. Perturbations of the asymptotically stable equilibrium are analyzed as well. This talk is based in the work [1] which was developed in collaboration with Professor Stanislav Antontsev[2].

References

[1] S.N. Antontsev and H.B. de Oliveira, Asymptotic behavior of trembling fluids, *Nonlinear Anal. Real World Appl.* **19** (2014), 54–66.

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