

FLOW OF NON-NEWTONIAN FLUIDS

600 – FLUID DYNAMICS AND TRANSPORT PHENOMENA

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ABSTRACT

The flow of non-Newtonian fluids is widely spread not only in technical apparatus of chemical and mechanical engineering industry but also in biological flows. Effects like shear-thinning or shear-thickening viscosity, extension viscosity, normal stress differences and memory behaviour are influencing the flow behaviour dramatically. The theoretical and numerical analyses of such non-Newtonian characteristics are important in order to predict a realistic flow field. The complexity of these models are challenging in regard to implementation in CFD codes and validation processes, in particular, when secondary flow phenomena have to be considered. In this MS special attention is laid on the mixed problem of the impact of thermal loads and flow straining on the viscosity of non-Newtonian fluids and associated flow phenomena, i.e. regarding viscoelastic behaviour.

The aim of the mini-symposium is to bring together researchers, scientist and professional user working in the field of non-Newtonian fluid flow, and to exchange ideas, new concepts and innovative approaches. We invite contributions in all areas of computational fluid mechanics of complex liquids including numerical methods, modelling of nonlinear or viscoelastic behavior by constitutive equations and determination of fluid material parameter. Further topics (experimental, analytical and numerical - not restricted) are:

- Benchmark non-Newtonian fluid flows
- Instabilities influenced by viscoelastic properties
- Heat transfer processes in complex liquids
- Multiphase flows involving non-Newtonian fluids
- Impact of blood flow modelling on hemodynamics

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