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ADVANCES IN NUMERICAL METHODS FOR INHOMOGENEOUS VISCOUS FLOWS: NON-NEWTONIAN, VISCOELASTIC, MULTIPHASE, EDDY-VISCOSITY AND OTHER COMPLEX MODELS

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ABSTRACT

In most of the literature on numerical methods for flow problems, especially incompressible ones, the assumption of constant viscosity is *at best* briefly discussed, as if to dismiss it as a minor simplification. This may lead to the impression that it is straightforward to employ classical numerical techniques in fluid problems with inhomogeneous viscosity – which is by no means true. Even a simple quasi-linear viscous law can lead to numerical instabilities, spurious boundary conditions, undesired matrix coupling, overall increase in computational complexity and demand, among other challenges.

In this context, our MS aims to bring together researchers working with computational methods for complex fluid models. This includes any model in which the viscous response *cannot* be described by a single parameter (viscosity): generalised Newtonian, viscoelastic, eddy-viscosity, two-phase and variable-density models are some examples. Contributions may focus on the formulation (e.g., stabilisation methods), the discretisation, the solution process and/or the modelling *per se*. Also regarding the numerical framework, all families are welcome, from finite elements to finite volumes, from meshless to unfitted discretisations.

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