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Application of the Augmented Lagrangian Method to Steady Pipe Flows of Bingham, Casson and Herschel-Bulkley Fluids

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The augmented Lagrangian method is applied to steady flow problems of Bingham, Casson and Herschel-Bulkley fluids in pipes of circular and square cross-sections. The plug flow velocity, the flow rate, the velocity profile and the locations of the yielded/unyielded surfaces are presented and compared with one another. The numerical strategy based on variational inequalities is shown to be realised easily and applicable extensively.