Yield stress fluid flows: numerical study of the solid–liquid interface with X-MESH

Abstract:
This work covers the topic of simple yield stress fluids described by the Bingham model. The work focuses on the solid-liquid interface that appears in the flows of these fluids. An interface tracking algorithm was developed for such 2D flows using the X-MESH idea, which allows extreme deformations of meshes in order to improve the accuracy of the simulations at low computational costs. The flow simulations are based on a variational approach and a finite element discretization. The resulting conic optimization problem is solved with an interior-point method.