ID de Contribution: **38** Type: **Non spécifié**

Modelling liquid foams with elastoviscoplastic fluid: shearband and smooth or abrupt localization

lundi 24 juin 2019 17:00 (30 minutes)

The Herschel-Bulkley rheological fluid model includes terms representing viscosity and plasticity. In this classical model, below the yield stress the material is strictly rigid. Complementing this model by including elastic behaviour below the yield stress leads to a description of an elastoviscoplastic (EVP) material such as an emulsion or a liquid foam. We include this modification in a completely tensorial description of cylindrical Couette shear flows. Both the EVP model parameters, at the scale of a representative volume element, and the predictions (velocity, strain and stress fields) can be readily compared with experiments. We perform a detailed study of the effect of the main parameters, especially the yield strain. We discuss the role of the curvature of the cylindrical Couette geometry in the appearance of localisation; we determine the value of the localisation length and provide an approximate analytical expression. We then show that, in this tensorial EVP model of cylindrical Couette shear flow, the normal stress difference strongly influences the velocity profiles, which can be smooth or non-smooth according to the initial conditions on the stress. This feature could explain several open questions regarding experimental measurements on Couette flows for various EVP materials such as emulsions or liquid foams, including the non-reproducibility that has been reported in flows of foams.

Auteur principal: SARAMITO, Pierre

Orateur: SARAMITO, Pierre

Classification de Session: Exposés

Classification de thématique: Présentation orale