

MM 45: Invited talk Horbach

Time: Wednesday 19:00–19:30

Location: H38

Invited Talk

MM 45.1 Wed 19:00 H38

Computer simulation of bulk-metallic glasses under shear: From inhomogeneous flow patterns to mechanical properties — •JUERGEN HORBACH¹, GAURAV PRAKASH SHRIVASTAV¹, and PINAKI CHAUDHURI² — ¹Institute for Theoretical Physics II, University of Düsseldorf, Germany — ²The Institute of Mathematical Sciences, Chennai, India

The response of glasses to mechanical loading often leads to the formation of inhomogeneous flow patterns that may strongly affect the materials properties. Among them, shear bands, associated with strain

localization in form of band-like structures, are ubiquitous in a wide variety of materials, ranging from soft matter systems to metallic alloys. Molecular dynamics simulations of a model of Ni₈₀P₂₀ are performed to investigate the formation of shear bands, using different flow protocols. Under an externally applied constant stress, persistent creep in the form of shear-banded structures is observed around the yield stress, whereas under the application of a constant strain rate, shear bands occur at sufficiently low strain rates. We analyze the nucleation of the shear-banded structures as well as the mechanical properties of the deformed glasses.