Universidad Carlos III de Madrid

Seminario del Instituto Gregorio Millán

Rate-dependent Avalanche Size in Athermally Sheared Amorphous Solids

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Resumen

Considerable efforts have been spent in recent years to derive constitutive laws for plasticity in amorphous media from a realistic description of the elementary mechanisms of dissipation. It is now agreed that in these disordered systems, plasticity involves "shear transformations", i.e. irreversible rearrangements (or flips) of small clusters of (a few tens of) particles. By analogy with Eshelby transformations, each flip can alter the strain field in its surroundings, hence generate long-range elastic fields. Flips can thus trigger further flips, a mechanism likely to give rise to avalanches. Yet, theories still diverge on the importance to grant to flip-flip correlations. Avalanches were first seen in numerical simulation of athermal systems, but only in the quasi-static limit (at vanishing strain rate), and the question remained outstanding whether they are relevant to experimentally accessible regimes of plastic deformation. After a quick review of quasi-static results, we will see how finite size studies of transverse diffusion under shear at finite strain rate provide evidence that indeed avalanche behavior should always be prevalent under experimental conditions.

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- HORA: **12:30**
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