Séminaire PMMH

Bureau d'Études, Bâtiment L, 2 $^{\text{ème}}$ étage

Vendredi 28 avril 2017, 11h00-12h00

Corrado Rainone

Weizmann Institute (Tel-Aviv, Israel)

Shear bands as manifestation of a criticality in yielding amorphous solids

The nature of the yielding transition in amorphous solids is a long-standing riddle which has attracted a lot of research effort in recent years. Recently, some of us have proposed a picture of yielding as a first-order like transition in a suitable overlap order parameter, measuring the degree of similarity between configurations within a given glass sample. Within this picture, yielding is identified with a spinodal point with disorder whereupon the high-overlap phase reaches its stability limit.

Spinodal points with disorder are always associated with heterogeneities which can be picked up by suitable multi-point correlators and whose lenghtscale grows rapidly on approaching the spinodal, the dynamical heterogeneities around the Mode Coupling Crossover being such an example. In this work we derive, with the aid of replica theory, an expression for a multi-point correlator which we then show to be able, in simulation, to pick up and characterize the spinodal-like criticality of the yielding transition, including the presence of a growing correlation lenght associated with heterogeneous excitations which become system-spanning at the yielding point. We argue that these excitations correspond with system-spanning shear bands which cause the glass to undergo a global particle rearrangement and fail mechanically.

Attention : pas de séminaire le vendredi 5 mai
Prochain séminaire : vendredi 12 mai, Jacques Treiner
Programme des séminaires : www.pmmh.espci.fr, onglet *Séminaires PMMH*
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