

Students' Annual Seminar

Role of Activity in Mechanical Response and Shear Band Formation in Ultrastable Glass

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Ultrastable glasses are very dense and have enhanced thermodynamic, kinetic, and mechanical stability compared to ordinary glasses, making them suitable for many practical uses. Despite these characteristics, they fail catastrophically with the emergence of shear bands. Using numerical simulations, we study the effect of active particles performing run-and-tumble motion on the mechanical response of such a system. We investigate the yielding behaviour in a soft-sphere polydisperse model system at finite temperature and finite shear rate. Our findings reveal a non-monotonic behaviour between yielding and persistence time, emphasising the significance of persistence time in the formation of shear bands in ultrastable glasses. We aim to comprehend the mechanism of yielding influenced by active particles and its consequential effect on shear band formation in ultrastable glasses.

Friday, Apr 26th 2024

14:00 Hrs (Tea / Coffee 13:45 Hrs)

CR-4, TIFR-H