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**Deformation of inherent structures to detect short- and long-range correlations in supercooled liquids** EMANUELA DEL GADO, MAJID MOSAYEBI, PATRICK ILG, HANS CHRISTIAN OETTINGER, ETH Zurich, MICROSTRUCTURE AND RHEOLOGY, ETH ZURICH TEAM, POLYMER PHYSICS, ETH ZURICH TEAM — We use deformation of inherent structures as a tool for detecting structural changes and the onset of cooperativity in supercooled liquids. The non-affine displacement (NAD) field resulting from the applied deformation shows characteristic differences between the high temperature liquid and supercooled state, that are typically observed in dynamic quantities and correlated to normal mode structure. The average magnitude of the NAD is very sensitive to temperature changes in the supercooled regime and is found to be strongly correlated with the inherent structure energy. We can rationalize such changes in terms of a crossover from a viscous liquid to a regime dominated by elastic effects. In addition, the NAD field is characterized by a correlation length that increases upon lowering the temperature towards the supercooled regime. By analysing different measures of correlations in the direction of the NAD field, we discuss their analogies with observations in the cooperative dynamics.

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