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Dynamical heterogeneity of star-polymers HAMED EMAMY, Wesleyan Univ, ALEXANDROS CHREMOS, JACK DOUGLAS, National Institute of Standards and Technology, FRANCIS STARR, Wesleyan Univ — The formation of a glass is one of the most vital features of amorphous polymers. While this subject has been exhaustively studied for linear chain polymers, comparatively little is known about the glass formation of star polymers, one of the most important classes of branched polymers. Using molecular dynamics simulation methods, we study the dynamical heterogeneity of star-polymers. We characterize the cooperative nature of the dynamic properties melts via the non-Gaussian nature of displacements, four-point correlations, clusters of highly mobile monomers, and subsets of string-like monomer motion. We contrast the behavior to that of ordinary linear chains, considering the role of both number of arms and molecular weight. In doing so, we quantify the degree to which the topology of star polymer plays a role in dynamical heterogeneity.

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