

1142-57-122

Eleni Panagiotou* (panagiotou@math.ucsb.edu). *The effect of topological and geometrical constraints on polymer material properties.*

We investigate how the entanglement of polymeric chains relates to bulk viscoelastic responses in polymeric materials. We show how the structure of the material can be analyzed using results from topology to develop new tools for polymer entanglement. More precisely, we develop three dimensional computational models to relate entanglement topology, polymer mechanics, to bulk viscoelastic responses of the material. We study in particular woven polymer configurations having similar polymer densities but different topologies. Our approaches provide new mathematical tools for characterizing the origins of the rheological responses of polymeric materials. (Received August 31, 2018)