Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Students' Annual Webinar

First contact breaking distributions in strained disordered crystals

Roshan Kumar Maharana

We develop a general technique to determine the probability distribution of strains at which the first contact breaking events occur in strained disordered crystals. This is accomplished through an exact mapping between the cumulative distribution of such events and the volume of a convex polytope whose dimension is determined by the number of defects in the system. An exact numerical computation of this polytope volume for systems with a small number of defects displays a remarkable match with the distribution of strains generated through direct numerical simulations. Finally, we also derive first contact breaking distributions assuming that individual contact breaking events are uncorrelated, which accurately reproduces distributions obtained from direct numerical simulations.

Thursday, May 12th 2022

5:00 PM