

Project number 6:

Pinning and relaxation of dislocations in continuum and atomistic models (2020/2023)

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Title: Dislocation in High Entropy Alloys at Finite Temperatures

Short abstract: In this study uses large-scale molecular dynamics simulations to investigate the dislocation roughness profile in a Fe-Ni-Cr-Co-Cu equicomposition high-entropy alloy (HEA). These simulations indicate that the roughness profiles of dislocation follow power-law scaling in both short- and long-wavelength regimes with a temperature-dependent crossover. Comparison with the roughness of the corresponding average alloy (AA) reveals the impact of thermal and composition fluctuations on dislocation roughness. The short-wavelength regime agrees well with the average alloy, but a gap exists in the long-wavelength. The findings contribute to understanding solid solution strengthening in high-entropy alloys.