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Atomistic Simulation of shock induced dislocation dynamics and evolution of different plasticity mechanisms in Single Crystal Copper ANUPAM NEOGI, NILANJAN MITRA, Indian Institute of Technology Kharagpur — Deformation and observation of different types of plasticity mechanisms of FCC metals (e.g. Copper) under shock loading of various intensities has been investigated by several groups of researchers around the globe through different types of experiments and/or atomistic simulations. However, there still exists lacuna in this well researched area. In this study the temporal details of dislocation dynamics are provided. Simulations also demonstrate different types of temporal evolution of different loops observed for single crystal Cu under different intensities of shock loading. Observance of formation of twins and their temporal evolution at higher intensities of shock loading are also demonstrated as part of this study. Comparisons of these NEMD simulations using EAM potential are discussed with regards to different experimental and simulation studies in literature.

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