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Nonequilibrium Molecular Dynamics Simulations of Ejecta Formation in Helium-Implanted Copper RACHEL FLANAGAN, SARYU FENSIN, University of California, San Diego, TIMOTHER GERMANN, Los Alamos National Laboratory, MARC MEYERS, University of California, San Diego — The shock behavior of helium-implanted copper single crystals is investigated through non-equilibrium molecular dynamics simulations. Although copper has been well-studied by both experiments and simulations, its dynamic behavior containing heterogeneities such as helium continues to be of great interest to the materials science community. We specifically explore the production of ejecta, which is formed when a planar shock wave reaches a free surface. Both atomic helium and helium bubbles are randomly generated and implanted in a perfect fcc copper single crystal. The crystal is then shocked along the [111] direction using a controlled piston. We present results describing the dependence of ejected mass on the shock strength, as well as the size and velocity distributions of the ejected mass. LA-UR-18-26126

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