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Homogeneous nucleation during melting and spallation SHENG-NIAN LUO, QI AN, TIMOTHY GERMANN, Los Alamos National Laboratory, LI-BO HAN, University of Science & Technology of China — Melt and void nucleation can be described with the classical nucleation theory in similar manners, and the critical nucleus size and steady state nucleation rate are key parameters. Numerical experiments such as molecular dynamics (MD) simulations yield atomistic scale details on nucleation, and different statistical methods are available to reduce MD simulations for extracting nucleation information. We conduct MD simulations of homogeneous nucleation of melt in single crystal Cu, and of void in liquid Cu and in single crystal Cu. The MD simulations are analyzed with two statistical methods and the results are compared. We also present a semi-empirical relation relating the critical tensile stress and strain rate based on the classical nucleation theory.

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