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Disorder–recrystallization effects following low-energy beam–solid interactions MATTHEW J. BECK, Physics and Astronomy, Vanderbilt University, D. M. FLEETWOOD, R. D. SCHRIMPF, Electrical Engineering, Vanderbilt University, S. T. PANTELIDES, Physics and Astronomy, Vanderbilt University — Classical MD simulations have shown that thermal-spike-related disorder, including local melting, should be widely expected following high energy (>1 keV) recoils resulting from beam– solid interactions during ion-beam processing. In contrast, the formation of isolated point defects by direct atomic displacement is expected for low energy (<1 keV) recoils. Using state-of-the-art dynamical DFT calculations of *c*-Si systems we show that recoils of much less than 1 keV result in highly disordered regions which persist for 100s of fs. Therefore, the production of beam-induced defects, as well as the post-implant yield of active dopants, following low-energy beam–solid interactions is controlled by dynamic recrystallization processes. This work was supported in part by the AFOSR through a MURI grant.

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