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Laser-induced nonthermal diffusion of impurities and vacancies in Silicon

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Laser-induced disordering processes have been studied intensively during the last decades. In this work, we present investigations of a laser induced ordering process which consists in the controlled mobility of crystal defects. In order to study the possibility to guide vacancies by femtosecond-laser pulses we performed ab initio molecular dynamics simulations of laser-excited Silicon with different defect densities using our code CHIVES (Code for Highly Excited Valence Electron Systems). The objective of this study is to determine the impact of laser excitation on defects (vacancies and impurity atoms) migration in Silicon (Si). Starting from initially randomly distributed defects, we simulated the ultrashort time dynamics of the system after laser heating. As a preliminary results we observed the changed mobility of the vacancies.

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