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**On the control of electron heating for optimal radiation pressure ion acceleration** HSUAN-GU CHOU, ANNA GRASSI, SLAC National Accelerator Laboratory, Stanford University, SIEGFRIED GLENZER, FREDERICO FIUZA, SLAC National Accelerator Laboratory — Intense laser-plasma interactions offer the possibility of producing short high-energy ion beams for a wide range of applications. However, it is not yet well understood how the details of the laser-plasma interaction impact the spectral quality of the accelerated ions. We have performed 2D and 3D particle-in-cell simulations for a large set of laser and plasma parameters to explore how electron heating impacts the quality of ions produced in the radiation pressure acceleration regime. We show how the electron heating, stability of the target surface, and ion acceleration depend on the laser polarization, profile, and angle of incidence, as well as on the plasma density. Based on this study, we have developed a model for optimal radiation pressure acceleration and validate it against 3D PIC simulations. These results are expected to help optimize the beam quality in future ion acceleration experiments.

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