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Collisional effects on solid density heavy ion laser-plasma targets

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The interaction of both linearly and circularly polarized laser pulses with high-Z solid targets is investigated through PIC simulations, using the SMILEI particle-in-cell code that features a thoroughly benchmarked relativistic collisional module. Even though circular polarization (CP) mitigates collisionless hot-electron acceleration processes compared with linear polarization, inverse bremsstrahlung leads to a significant hot electron tail in the 100 keV energy range, whose subsequent relaxation causes bulk electron heating up to 10s of keV temperatures. The main difference between CP and LP, is that LP produces a relativistic electron population which thermalizes weakly during the time scales studied, whereas CP gives a close approximate Maxwellian electron population.

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