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Numerical study of fast electron transport and core heating in cone-guiding fast ignition RYAN ROYLE, YASUHIKO SENTOKU, University of Nevada, Reno — A critical issue for the fast ignition (FI) of inertial fusion targets—where the compressed fuel is to be ignited by fast electrons generated by an ultrashort, ultraintense laser pulse—is whether the electrons will reach the core region and deposit sufficient energy to ignite fusion burn. In the cone-guiding FI scheme, a gold cone is embedded into the target capsule to keep the ignition beam path clear of coronal plasma and bring the critical surface closer to the core. This work presents the results of comprehensive two-dimensional particle-in-cell simulations of cone-guided FI using the PICLS code, which includes collisional, ionization and radiative processes. We study the impact of various gold cone tip geometries on the fast electron transport and generation of resistive magnetic fields that are supposedly excited in the core region. The details of simulation results and scaling of resistive magnetic field guiding are presented.

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