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Energy transport in ultra-fast eated solid targets[1] YASUHIKO SENTOKU, University of Nevada, Reno, TOMOYUKI JOHZAKI, ILE, Osaka University, Japan, ANDREAS KEMP, Lawrence Livermore National Laboratory — We discuss hot electron generation in ultra intense laser interaction with initially non-ionized matter. Hot electron energy and the transport inside the target are strongly affected by collisional effects and ionization processes, especially in high-Z material. We have introduced an ionization model into our collisional particle-in-cell code, PICLS, to study hot electron transport in ultra-fast heated matter. Our description of collisional ionization is based on the Thomas-Fermi model, where a local average charge state is calculated from the bulk electron temperature and density. Field ionization is taken into account for ionization of low density plasmas. We have studied laser matter interaction under an irradiation of a laser with 10^{20}W/cm^2. A strong heat inhibition within a micron distance was observed in a gold target because of the large number of lower energy hot electrons produced at the steepened interface by the laser photon pressure. We will discuss the generation of hot electrons and their transport in ultra-fast heated solid targets of various materials.

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