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Electron heat transport at the interface between hot and cold plasmas GRIGORY KAGAN, XIANZHU TANG, ANDREI SIMAKOV, Los Alamos National Laboratory — In high energy density plasma experiments where compression is used to form a central hot target plasma, an interface between the hot but low density and cold but dense plasmas often appears. Evaluation of energy transport, especially electron thermal conduction, across this interface, if it is sufficiently sharp, could be complicated by an electric field localized about the boundary between the plasmas. The field emerges through a mechanism, which is somewhat similar to that of the sheath formation and due to the hot electrons traveling at much greater velocities than their cold counterparts. Such a strong electric field can further modify the distribution function of electrons and therefore their thermal conductivity. To calculate this field we treat hot electrons kinetically, assuming that their mean free path is greater than the interface width. On the other hand, the cold electron bulk is collisional and therefore described by usual fluid equations. By including the sheath-like effects into consideration, we are then able to find a more appropriate expression for the rate of the heat exchange between the hot and cold plasmas.

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