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Atomistic simulation of laser ablation of gold: the effects of electronic pressure VLADIMIR STEGAILOV, SERGEY STARIKOV, GENRI NORMAN, Joint Institute for High Temperatures Russian Academy of Sciences — In this work we study the ablation of gold foils irradiated by femtosecond laser pulses. We build an atomistic model of gold that capture electron heat conductivity, electron energy transfer and the raise of the electronic pressure after energy deposition. The latter is done by means of the EAM potential for gold that parametrically depends on the electron temperature. The electronic pressure effects are shown to play an important role in the ablation processes and result in a new ablation mechanism observed in our simulations. The thickness of the ablation layer as a function of the irradiation fluence is calculated and compared with the experimental data. It is argued that the new ablation mechanism observed in this work can explain the known experimental discrepancies on the ablation data.

Vladimir Stegailov
Joint Institute for High Temperatures Russian Academy of Sciences

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