INTERACTION OF FEMTOSECOND LASER RADIATION WITH GOLD FOIL: MOLECULAR DYNAMICS SIMULATION

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The paper investigates the melting of a thin gold foil 35 nm thick after its irradiation by ultrashort laser pulses of duration $\tau_p = 130$ fs. Calculations were done with a classical molecular dynamics method implemented in the code LAMMPS [1]. A well-optimized EAM potential by Sheng et al [2] was used. Laser pulse absorption by electrons and energy transfer from electrons to the lattice were described with a two-temperature model [3]. Absorbed energies of interest lied between 0.18 MJ/kg and ~2 MJ/kg. Calculated results on the time of complete gold melting versus absorbed laser energy are compared with experimental data.

References

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