Abstract Submitted
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Ultrashort laser pulse absorption in dense targets S.G. BOCHKAREV, W. ROZMUS, University of Alberta, Canada, M. SHERLOCK, Imperial College, UK, A.V. BRANTOV, V. YU. BYCHENKOV, Lebedev Physics Institute, Russia — A theory of ultrashort laser pulse absorption in dense targets is important for modeling of basic physics and applications of short laser pulse plasma interactions. Recent absorption measurements and large number of indirect observations point to complex scenarios of short laser pulse absorption where the laser prepulse, ionization physics, density profile modifications, collisional processes and collisionless mechanisms occur all within short pulse duration and contribute to the absorbed fraction of the incident laser energy. A model of ultrashort laser pulse absorption, which includes linear absorption and thermal transport into dense plasma will be described. Plasma dielectric function in our model describes collisional and collisionless absorption mechanisms including the effect of electron-electron collisions. Thermal transport is modeled using nonlocal expressions that are valid in the weakly collisional regime. The inhibited and nonlocal thermal transport can contribute to the increase of the electron temperature in the skin layer. Theoretical predictions will be compared with the results of Vlasov-Fokker-Planck simulations for moderate laser intensities. Also numerical simulations will illustrate transition into relativistic regime of laser intensities.

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