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Ultrashort laser pulse absorption and target heating[1] SERGEY BOCHKAREV, WOJCIECH ROZMUS, Department of Physics, University of Alberta, Edmonton, Canada, ANDREI BRANTOV, P. N. Lebedev Physics Institute, Moscow, Russia, VALERY BYCHENKOV, MARK SHERLOCK, Plasma Physics Group, Imperial College, London, UK — 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 experiments have challenged our understanding of absorption processes by showing dramatic increases of absorbed laser energy fraction at relativistic intensities. An important issue is the question how and with what efficiency the laser energy could be absorbed in dense plasmas. We describe a model of ultrashort laser pulse absorption which includes linear absorption and thermal transport into dense plasma. 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. We also compare our results with Vlasov-Fokker-Planck simulations.

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