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Laser Absorption by Over-Critical Plasmas[1] J. MAY, J. TONGE, UCLA, F. FIUZA, SLAC, R.A. FONSECA, L.O. SILVA, IST, W.B. MORI, UCLA — Absorption of high intensity laser light by matter has important applications to emerging sciences and technology, such as Fast Ignition ICF and ion acceleration. As such, understanding the underlying mechanisms of this absorption is key to developing these technologies. Critical features which distinguish the interaction of high intensity light - defined here as a laser field having a normalized vector potential greater than unity - are that the reaction of the material to the fields results in sharp high-density interfaces; and that the movement of the electrons is in general relativistic, both in a fluid and a thermal sense. The results of these features are that the absorption mechanisms are qualitatively distinct from those at lower intensities. We will review previous work, by our group and others, on the absorption mechanisms, and highlight current research. We will show that the standing wave structure of the reflected laser light is key to particle dynamics for normally incident lasers.

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J. May
UCLA

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