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XUV Opacity of Warm Dense Aluminum JUSTIN WARK, SAM VINKO, GIANLUCA GREGORI, BOB NAGLER, THOMAS WHTICHER, University of Oxford, MICHAEL DESJARLAIS, Sandia National Laboratories, PATRICK AUDEBERT, LULI, Ecole Polytechnique, RICHARD LEE, LLNL — We present calculations of the free-free XUV opacity of warm, solid-density aluminum at photon energies between the plasma frequency at 15 eV and the L-edge at 73 eV using a semi-classical model in the RPA framework with the inclusion of local field corrections. As the temperature is increased from room temperature to 10 eV, with the ion and electron temperatures equal, we calculate an increase in the opacity in the range over which the degree of ionization is constant. Noticeably, this feature is not reproduced by models based on inverse bremsstrahlung. The physical significance of this increase is discussed in terms of intense XUV-laser matter interactions on both femtosecond and picosecond timescales, and our model compared with detailed quantum molecular dynamics calculations (VASP).

Justin Wark
University of Oxford

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