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EUV emission from Sn plasmas[1] JAMES COLGAN, Los Alamos Natl Lab, JORIS SCHEERS, FRANCESCO TORRETTI, RUBEN SCHUPP, Advanced Research Center for Nanolithography, AMANDA NEUKIRCH, DAVID KILCREASE, JOE ABDALLAH, MANOLO SHERRILL, CHRIS FONTES, PETER HAKEL, Los Alamos Natl Lab, OSCAR VERSOLATO, Advanced Research Center for Nanolithography — We report on our continuing efforts to understand the EUV emission from tin plasmas of interest to nanolithography. Recent investigations have examined both the strong in-band emission at 13.5 nm, as well as the out-of-band emission at shorter wavelengths, from measurements of molten tin droplets illuminated by a high-intensity laser. The line features in the out-of-band region have been assigned to various transitions within the ions of most relevance (Sn^{8+} to Sn^{15+}). Recent theoretical work has been extended to examine the emission from tin at various temperatures and densities. Good agreement is found between the theoretical predictions and experiment for the in-band emission from plasmas generated at various laser energies. The agreement between theory and experiment for the out-of-band features is also quite reasonable. We describe the experimental effort to produce such tin plasmas and the associated diagnostics. We will discuss the atomic structure calculations made using the Los Alamos suite of atomic physics codes and emission calculations that have been made using the ATOMIC code to predict the emission at various plasma conditions. The role of radiation transport effects and possible gradients will also be discussed.

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