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Characterizing relativistic Thomson scattering angular distribution as a function of laser intensity[1] CALVIN HE, University of Maryland - College Park, ANDREW LONGMAN, Lawrence Livermore National Laboratory, SMRITHAN RAVICHANDRAN, University of Maryland - College Park, JON APINANIZ, JOSE PEREZ-HERNANDEZ, MASSIMO DE MARCO, LUIS ROSO, Centro De Laseres Pulsados, ROBERT FEDOSEJEVS, University of Alberta, WENDELL HILL, University of Maryland - College Park — The strength and angular distribution of light emitted by relativistic Thomson scattering of electrons in the focus of an intense laser subsequent to ionization of residual gas is intimately related to the intensity of the laser the electrons experience. While the dynamics is very complicated, our simulations indicate that in certain wavelength bands the angular distribution exhibits a prominent depression when viewed in the E-k plane, the location of which changes with intensity. In this presentation, we will present the results of the simulation and our preliminary experimental measurements that support the predictions of the simulations. The preliminary measurements were performed with an angular resolution of only 10 and a temporal resolution of 5 ns. We will present a design for an upgrade to our experimental approach that will enable angular distribution measurement to be made with higher angular precision (1) and better temporal resolution (5 ps with a streak camera) leading to less interference from scattered light and recombination radiation. Finally, we will discuss how to verify the intensity associated with specific locations of the dip by employing a time-of-flight ion detector and estimations of the appearance intensity of specific ionization stages.

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