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PIC simulations characterizing the Radiation Response of a Copper Target Excited by an Ultra-Short Laser Pulse. ALEXANDER KLEPINGER, PRESTON POZDERAC, The Ohio State University, ALEX RUSSELL, Voss Scientific LLC, DOUGLASS SCHUMACHER, The Ohio State University — The interaction of an intense, ultrashort-pulse laser with a solid conducting, dielectric, or semi-conducting target leads to dramatic modification of its surface and subsequent emission of electromagnetic (EM) radiation. This radiation may be an interesting probe of the laser-target interaction or useful in its own right. We have used LSP [1] particle-in-cell (PIC) simulations to characterize the low frequency (THz and below) radiation response of copper targets illuminated by single high intensity ultra-short laser pulses with intensities up to 10^{18} W/cm^2. Our simulations treat the material permittivity and reflectivity using a realistic collision model [2] based on the binary collision algorithm. This permits a realistic treatment of the target's dynamically changing electromagnetic response and thermal evolution beginning from a room temperature state, which then establishes the initial conditions for the subsequent current evolution and EM emission. This work was supported in part by AFRL under award FA9451-19-C-0011. [1] Welch, D. & Rose, D., Comp. Phys. Comm. **164**, 183-188 (2004) [2] A.M. Russell and D.W. Schumacher, Physics of Plasmas **24**, 080702 (2017).

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