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PIC Modeling of Relativistic Electron Transport Experiments on Omega EP[1] JOSH MAY, J. TONGE, W.B. MORI, UCLA, F. BEG, C. MCGUFFEY, M. WEI, UCSD, R. FONSECA, GoLP/IPFN&IST — Recent experiments on the Omega EP laser system have used an intense laser ($I \sim 10^{19} W/cm^2$, $\tau \sim 8ps$) striking Au foil to generate a relativistic electron beam, which is subsequently transported through either CH plasma or room temperature CH foam, and then diagnosed with Cu $K\alpha$ from a Cu foil. An order of magnitude lower $K\alpha$ emission is seen in the plasma case compared to the cold case. We use the particle-in-cell code OSIRIS to model the experiment in the case of pre-formed plasma. Our 2D simulations show a similarly broad transverse profile as experiment. We also see a strong filamentary B-field in the CH region directly adjacent to the gold, with filaments similarly diverging from the laser spot. Increasing the CH density dampens these filaments, and leads to a more intense and more collimated electron spectrum in the Cu region, consistent with experiment.

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