Compton Scattering in Ignited Thermonuclear Plasmas$^1$ FREDERIC HARTEMANN, CRAIG SIDERS, CHRIS BARTY, LLNL — Inertially confined, ignited thermonuclear D-T plasmas will produce intense blackbody radiation at temperatures $T \sim 20$ keV; it is shown that the injection of GeV electrons into the burning core can efficiently generate high-energy Compton scattering photons. Moreover, the spectrum scattered in a small solid angle can be remarkably monochromatic, due to kinematic pileup; peak brightness in excess of $10^{29}$ photons/(mm$^2 \times$ mrad$^2 \times s \times 0.1\%$ bandwidth) are predicted. Electron focusing of the $\gamma$-rays could produce electromagnetic fields exceeding the Schwinger critical field.

$^1$This work was performed under the auspices of the U.S. Department of Energy by University of California, Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.