Abstract Submitted
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A Concept for Measuring Electron Distribution Functions Using Collective Thomson Scattering A.L. MILDER, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — A.B. Langdon[1] proposed that stable non-Maxwellian distribution functions are realized in coronal inertial confinement fusion plasmas via inverse bremsstrahlung heating. For $Zv_{\mathrm{osc}}^2 \big/ v_{\mathrm{th}}^2 > 1$, the inverse bremsstrahlung heating rate is sufficiently fast to compete with electron–electron collisions. This process preferentially heats the subthermal electrons leading to super-Gaussian distribution functions. A method to identify the super-Gaussian order of the distribution functions in these plasmas using collective Thomson scattering will be proposed. By measuring the collective Thomson spectra over a range of angles the density, temperature and super-Gaussian order can be determined. This is accomplished by fitting non-Maxwellian distribution data with a super-Gaussian model; in order to match the density and electron temperature to within 10%, the super-Gaussian order must be varied. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

[1]A. B. Langdon, Phys. Rev. Lett. **44**, 575 (1980).

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