

## NON-GAUSSIAN CUMULATIVE SCATTERING IN AN INERTIAL CONFINEMENT FUSION PLASMA

O.J. Pike<sup>1</sup>, S.J. Rose<sup>1</sup>

<sup>1</sup>Imperial College, London, United Kingdom  
o.pike11@imperial.ac.uk

The Coulomb interaction dictates various microphysical processes relevant to ICF, such as electron-ion equilibration, thermal conduction and charged particle stopping. For each of these, it is typically many small-angle collisions that in combination determine the dynamics of the system [1].

Traditional plasma physics texts [1,2] calculate the sum effect of these small angle scatterings by adding the contribution of each in quadrature via the standard sum of errors. However, as is well established in nuclear physics [3], the angular deflection of a charged particle undergoing multiple scatterings can exhibit distinctly non-Gaussian features.

Here, through the use of numerical simulations, we examine the effect of non-Gaussian cumulative scattering on various processes in a plasma. Particular focus is given to the impact this may have for the microphysics of ICF.

[1] L. Spitzer Jr, *The Physics of Fully Ionized Gases* 2nd Ed. (Wiley, New York, 1962)

[2] B.A. Trubnikov, in *Reviews of Plasma Physics*, Vol. 1, ed. M.A. Leontovich (Consultants Bureau, New York, 1965) p105

[3] W.T. Scott, *Rev. Mod. Phys.* **35**, 231 (1963)