Abstract Submitted
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Fermi Acceleration and Fusion Reactivity in Low-ρR Inertial Fusion Hot Spots[1] B.J. ALBRIGHT, KIM MOLVIG, N.M. HOFFMAN, E.S. DODD, A.N. SIMAKOV, Los Alamos National Laboratory — For inertial confinement fusion hot spots at sufficiently low fuel ρR, the ions that dominate the fusion reactivity may be effectively collisionless and the evolution of their distribution functions will be governed by nonlocal, kinetic physics. A simple model based on an analogy with Fermi acceleration of cosmic rays has been developed for the tail populations of these ions. It is found that a fraction of fast ions entering the pusher dominantly pitch-angle scatter in the shell and are isotropized upon reentering the fuel region. After a few encounters with the pusher, the fuel ion distribution functions adopt a common, exponential form scaling with the radial speed of the pusher and varying with the "albedo" of the shell to incident ions. Fusion reactivity and inferred hot spot temperature and density have features consistent with recent experimental data and may provide an alternative explanation for reported yield anomalies.

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