Abstract Submitted
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Fokker Planck theory for energetic electron deposition in laser fusion WALLACE MANHEIMER, DENIS COLOMBANT, Retired — We have developed a Fokker Planck model to calculate the transport and deposition of energetic electrons, produced for instance by the two plasmon decay instability at the quarter critical surface [1]. In steady state, the Fokker Planck equation reduces to a single universal equation in energy and space, an equation which appears to be quite simple, but which has a rather unconventional boundary condition. The equation is equally valid in planar and spherical geometry, and it depends on only a single parameter, the charge state Z. Hence one can solve for a universal solution, valid for each Z. An asymptotic solution to this equation will be presented, which allows the heating of the main plasma to be calculated from a simple analytical expression. A more accurate solution in terms of a Bessel function expansion will also be presented. From this, one obtains a heating rate which can be simply incorporated into fluid simulations.

[1] B. Yaakobi et al, Phys. Plasmas 19, 012704, 2012. Work supported by DoE-NNSA and ONR

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