

Abstract Submitted  
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**Particle-in-cell Simulations of laser plasma interactions near the quarter critical surface**<sup>1</sup> F.S. TSUNG, UCLA, B.B. AFEYAN, Polymath Research Inc., W.B. MORI, UCLA — We present simulation results on the laser-plasma interaction near the quarter critical surface under conditions relevant to inertial fusion. Under these conditions, the high frequency hybrid instability (HFHI) where the backward going daughter wave have mixed polarizations, is likely to be dominant. In high temperature plasmas where HFHI modes is dominant the absorption level can be high (up to 40%) for systems which are below the two plasmon threshold. This result implies, for laser pulses with a long (compared to the instability growth time, in the order of 1ps) rise time, the mixed polarization modes with small perpendicular wavenumber will play a even more dominant role. The effects of finite spot-size due to laser speckles, and the interaction of overlapping speckles will also be investigated.

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