Abstract Submitted
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Particle-in-Cell Simulations of the High Frequency Hybrid Instability and Two Plasmon Decay[1] FRANK TSUNG, W.B. MORI, UCLA, B.B. AFEYAN, Polymath Research Inc. — A comprehensive set of PIC simulations of laser-plasma interactions at or near the quarter critical density of laser-produced plasmas has been conducted. In order to isolate physical effects, we conduct fixed, mobile ion simulations, and simulations with rapid and adiabatic rise times. In the fixed ion simulations near threshold the instability is dominated by absolute modes with growth rates and ranges of transverse wave numbers in agreement with the theoretical results Afeyan and Williams (1995 & 1997)[1,2]. These include the high frequency hybrid modes (HFHI). Further above threshold, modes with larger transverse wave numbers occur at lower densities and these were identified as convective modes. There can be a strong interaction between the modes at low density and the absolute modes at higher densities on the hot electron spectrum. The role of the adiabatic rise time on the instability will be discussed. Finally, we will also investigate the role of mobile ions on the excitation of the 2wp/HFHI modes, and the subsequent absorption of speckles in regimes relevant to direct ICF and fundamental HEDLP studies. [1] B. B. Afeyan, E. A. Williams, *Phys. Rev. Lett.,* **75** 4218 (1995). [2] B. B. Afeyan, E. A. Williams, *Phys. Plas.,* **4**, 3827 (1997).

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Frank Tsung
UCLA

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