

Abstract Submitted
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Extremely Nonsinusoidal Emissions and Fast Electron Phenomena from Strong Laser Pulses Obliquely P-Incident on Sharp-Edged Plasmas¹

T.W. JOHNSTON, L. NIKOLIC, Y. TYSHETSKIY², F. VIDAL, INRS-EMT — High laser harmonic light [1] emerges when the Vulcan petawatt laser's sub-ps laser pulses are obliquely incident on slab targets with extremely low pre-pulse energy. Similar work is in progress with the ALLS 200 TW Ti-Saph laser at INRS EMT. (Pulses are 24 fs at 10 Hz with 10^{-10} contrast, even without plasma mirrors). 2-D PIC (OSIRIS code at INRS) results on basic mechanism(s) resemble those of Gibbon [2], Naumova et al. [3] and Thaury et al. [4]. The very large and asymmetric electromagnetic "spikes" which account for the high harmonic content are produced by extremely concentrated 2D plasma surface currents. The connection between our 2D PIC results (also those in [3] and 1D PIC results [2,4] using the Gibbon-Bourdier moving 1D formalism[2] is also discussed, as are the fast electrons, including some related quasi-steady magnetic fields. [1] B. Dromey et al Nature Phys. Lett., 2, 456-459 (2006) [2] Paul Gibbon, Phys. Rev. Lett. 76, 50 (1996) [3] N. Naumova, et al., Phys. Rev. Lett. 93, 195003 (2004). [4] C. Thaury, et al., Nature Phys. 3, 424 (2007)

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