

Abstract Submitted
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Transverse Electron Motion and Multiple Electron Injection in Blowout Bubble of Laser Wakefield Accelerator T. MATSUOKA¹, C. MCGUFFEY, P.G. CUMMINGS, Y. HOROVITZ², F. DOLLAR, W. SCHUMAKER, V. CHVYKOV, G. KALINTCHENKO, P. ROUSSEAU, V. YANOVSKY, S.S. BULANOV, A.G.R. THOMAS, A. MAKSIMCHUK, K. KRUSHELNICK, CUOS U. of M. — An analytical formula for electron motion in a spherical bubble was compared with data from electron acceleration experiments using the HERCULES laser system showing reasonable agreement. This also provides evidence for continuous injection of electrons into the bubble with multiple bunches in the bubble separated both transversely and longitudinally. The only free parameter in the analytical model was radius of the bubble (r_b) which was found to be close to the matched spot size for self focusing. The RMS electron beam divergence is found to increase with bunch charge also suggesting tradeoff between beam divergence and photon number in applications for such beams as an x-ray source.

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