

Abstract Submitted
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Study of Pre-Pulse Effect on Generation of Quasi-Monoenergetic Electrons in Gas jets¹ J.A. CHAKERA, Y. TSUI, N. VAFAEI-NAJAFABADI, A. ALI, R. FEDOSEJEVS, Dept. of Elec. and Computer Engr., Univ. of Alberta — Generation of quasi monoenergetic electrons in wakefield produced by high intensity fs laser pulses in gas jet has been a growing area of research. Reproducibility of the electron energy and beam stability is still an issue. Efforts are under way to achieve stable beams from such accelerators to be useful for practical application. In order to achieve a stable beam, it is important to study the plasma density profile and its evolution in time during the interaction. In most cases the shot to shot fluctuation may arise from the presence of pre-pulse, which varies from shot to shot, leading to variations in the gas jet density profile. Experiments were performed using the 10 TW laser beamline at ALLS facility. The 200 mJ, 32 fs laser pulses were focused into a 2mm diameter gas jet to a focal spot of 11 μm . The study has been carried out to correlate the high-energy electron generation and x-ray bremsstrahlung with the laser pre-pulse level. Electron energies in the range of 10-30 MeV for N₂ and 10-40 MeV for He have been observed. The characterization of plasma density was carried out using interferometric measurements. Measurements on side scattered and forward Raman Scattered light have also been carried out and the results obtained will be presented.

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