

Abstract Submitted
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Compton X-rays from Self-Generated Backscattered Radiation in a Laser Wakefield Accelerator¹ ANTONIO TING, DMITRI KAGANOVICH, MICHAEL HELLE, Naval Research Lab, YU-HSIN CHEN, RSI, Inc., JOHN PALASTRO, BAHMAN HAFIZI, DANIEL GORDON, Naval Research Lab — A unique Compton scattering configuration for generating monochromatic, short pulse, and potentially coherent x-rays in a Laser Wakefield Accelerator (LWFA) is being studied at the Naval Research Laboratory. Reflection mechanisms such as stimulated Raman scattering and shock-created density gradients in a plasma can generate the required backward-travelling laser pulse directly from the same laser pulse used in the LWFA, i.e., the high energy electron beam and the counter-propagating photon beam are both self-generated by an ultrashort laser pulse in plasma. Extended interaction distance and automatic alignment of electron beam and backscattered radiation could be beneficial to the amplification of the Doppler upshifted Compton X-rays. Preliminary experiments are ongoing with measurement of Raman backscattering and reflection off a plasma density gradient. Energy resolved X-ray results are also anticipated.

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Antonio Ting
Naval Research Lab

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