

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**Compton Backscattered X-rays from Self-Generated Laser Wiggler in a Laser Wakefield Accelerator**<sup>1</sup> ANTONIO TING, DMITRI KAGANOVICH, BAHMAN HAFIZI, Naval Research Lab, JOHN PALASTRO, Icarus Research, Inc., MICHAEL HELLE, DANIEL GORDON, Naval Research Lab, YU-HSIN CHEN, RSI, Inc, JOHN SEELY, Artep Inc. — A unique Compton backscattering 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. The automatic alignment of the counter-propagating electrons and photons together with the extended interaction distance and tightly guided beam sizes in a LWFA can lead to a high-gain situation for the Doppler upshifted forward propagating x-rays. Possibilities for exponential gain to achieve coherent generation of the x-rays are under investigation. Theoretical, numerical, and preliminary experimental results will be presented.

<sup>1</sup>This work is supported by DOE and NRL 6.1 funding

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Date submitted: 11 Jul 2014

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