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Abstract for an Invited Paper  
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### **Bright X-Ray and Gamma Sources From Self-Modulated Laser Wakefield Acceleration<sup>1</sup>**

FELICIE ALBERT, Lawrence Livermore National Lab

This presentation will discuss the development of x-ray and gamma-ray sources based on laser-wakefield acceleration (LWFA) in the self-modulated regime. These sources are developed for probing high energy density (HED) science experiments at large-scale laser facilities. We will present recent experiments on the production of LWFA-based radiation, with photon energies from a few keV to a few MeV, using picosecond laser pulses. At the Titan laser (LLNL, 150 J, ps), we demonstrated evidence of betatron, Compton scattering, and bremsstrahlung emission in the self-modulated regime of laser wakefield acceleration (SMLWFA). For each radiation generation mechanism, we will go over detailed experimental properties and characterization of the sources, as well as supporting Particle In Cell simulations. We will also discuss the results of recent shots conducted with OMEGA-EP (LLE, University of Rochester) and the National Ignition Facility's Advanced Radiographic Capability (LLNL), where we have demonstrated electron acceleration up to a few 100s MeV energies for the development of future particle and x-ray probe platforms at these facilities.

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