Abstract Submitted
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MeV photon generation based on Thomson scattering using compact laser-plasma accelerators[1] HAI-EN TSAI, TOBIAS OSTERMAYR, LIONA FAN-CHIANG, ROBERT JACOB, ALEXANDER LAUT, OCEAN ZHOU, SAM BARBER, FUMIKA ISONO, JEROEN VAN TILBORG, REMI LEHE, JEAN-LUC VAY, ANTHONY GONSALVES, KEI NAKAMURA, CSABA TOTH, CARL SCHROEDER, CAMERON GEDDES, ERIC ESAREY, Lawrence Berkeley National Laboratory, BELLA CENTER TEAM — Compact, narrow bandwidth, femtosecond-pulsed, MeV photon sources have the potential to offer advanced source parameters to benefit a number of fields, including nuclear nonproliferation, medicine, industrial CT scan, and photon nuclear spectroscopy. We produce such sources through Thomson scattering of a separately controlled 'scatter' laser pulse from the electron beam of a laser-plasma accelerator. The "scatter" line has independent compression to enable high flux with controlled photon bandwidth and to enable future control of pulse shape. A high flux photon source with tunable energy and quasi-monoenergetic spread was achieved using this independent control of pulse shape and a well-developed alignment technique. The presentation will include techniques required for spatial and temporal overlap between focused beams, beam stability studies, and the MeV gamma ray diagnostics employed in the research.

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Hai-En Tsai
Lawrence Berkeley National Laboratory

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