Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Laser-driven ultrafast multi-MeV gamma-ray beam generation. JIANCAI XU, BAIFEI SHEN, TONGJUN XU, SHUN LI, YONG YU, JINFENG LI, XIAOMING LU, CHENG WANG, XINLIANG WANG, XIAOYAN LIANG, YUXIN LENG, RUXIN LI, ZHIZHAN XU, State Key Laboratory of High Field Laser Physics, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences — Ultrafast multi-MeV high-flux gamma-ray beams have been experimentally produced via bremsstrahlung radiation of laser-accelerated energetic electrons through millimeter-thick copper targets. By optimizing the electron bunches to the charge of 10 nC in a clustering argon gas target, the obtained gamma-ray beam significantly increases to 10^{10} photons per shot. The gamma-ray beam spectrum has been measured using a differential filtering detector and has a broad spectrum up to 15 MeV, which is approximately consistent with the Geant4 simulation. The generated high-flux high-energy gamma-ray beams are promising sources for photonuclear reaction, non-destructive inspection and clinical applications.

Tongjun Xu, Baifei Shen, Jiancai Xu, *et al.*, *Phys. Plasmas* 23, 033109 (2016).

Shun Li, Baifei Shen, Jiancai Xu, *et al.*, Ultrafast multi-MeV gamma-ray beam produced by laser-accelerated electrons (submitted).

Jiancai Xu
Chinese Academy of Sciences

Date submitted: 21 Jul 2017 Electronic form version 1.4