Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Novel approach to the Schwinger limit using micro bubble implosion MASAKATSU MURAKAMI, MYLES ALLEN ZOSA, ILE, Osaka University, JAMES KOGA, Kansai Photon Science Institute, YOSHIHIDE NAKAMIYA, Extreme Light Infrastructure - Nuclear Physics, ALEXEY AREFIEV, UCSD — We propose a novel principle to approach the Schwinger limit using micro-bubble implosion (MBI) [1, 2]. Being supported by the three-dimensional particle simulations, we have developed a semi-analytical 1D model to estimate the attainable electric field with MBI to derive the limiting curve and the relevant scaling in terms of the applied laser intensity, the spatial degree of ionization, and the bubble radius. Introducing high-Z materials as the target composition or a surface coating should realize higher attainable electric fields by MBI. It is shown that pair creation becomes active at around the maximum compression of MBI, when the ultrahigh-energy-density nanosphere is formed at the center. [1] M. Murakami et al., Sci. Rep. 8, 7537 (2018). [2] M. Murakami et al., Plasmas 26, 043112 (2019).

Masakatsu Murakami
ILE, Osaka University

Date submitted: 16 Jun 2019 Electronic form version 1.4