

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Heavy ion acceleration driven by THE INTERACTION BETWEEN ultraintense Laser pulse AND sub-micron foils JINQING YU, C. MCGUFFEY, F.N. BEG, Center for Energy Research, UCSD, La Jolla, CA, USA, HIGH ENERGY DENSITY GROUP TEAM — For ion acceleration at the intensity exceeding $10^{21}\text{W}/\text{cm}^2$, Radiation Pressure Acceleration (RPA) could offer advantages over Target Normal Sheath Acceleration (TNSA) and Break-Out Afterburner (BOA). In this ultra-relativistic regime, target electrons become highly relativistic and the results are sensitive to many parameters. Especially for heavy ions acceleration, the understanding of the most important parameter effects is limited due to the lack of experiments and modeling. To further understand the key parameters and determine the most suitable regimes for efficient acceleration of heavy ions, we have carried out two-dimensional Particle-in-Cell simulations with the epoch code. In the simulations, effects of preplasma and optimal targets thicknesses for different laser pulse have been studied in detail. Based on the understanding of ion RPA, we propose some new target parameters to achieve higher ion energy. This work was performed with the support of the Air Force Office of Scientific Research under grant FA9550-14-1-0282.

Jinqing Yu
Center for Energy Research, UCSD, La Jolla, CA, USA

Date submitted: 24 Jul 2015

Electronic form version 1.4