Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Molecular Dynamics Simulations of the interaction of an electron beam with a plasma crystal[1] JEREMIAH WILLIAMS, Wittenberg Univ, CATALIN TICOS, Extreme Light Infrastructure - Nuclear Physics , DORINA TICOS, ADRIAN SCURTU, National Institute for Laser, Plasma and Radiation Physics, LORI SCOTT, Auburn University, DUSTIN SANFORD, Baylor University, EDWARD THOMAS, JR., Auburn University — The kinetic effects on the dust particles in a plasma crystal locally irradiated by a narrow, pulsed electron beam (EB) with energies from 10 15 keV have recently been presented. [C.M. Tico, et. al., Phys. Plasmas, Phys. Plasmas 26, 043702 (2019)., C.M. Tico, et. al., Plasma Phys. Control. Fusion 62, 025003 (2020)] These studies have revealed that the EB pushes the dust particles in the irradiation zone, leading to both laminar and turbulent flow. Further, these studies have examined interaction of the EB is described in terms of the electron penetration depth, deposited energy and heating of the MPs, as well as resulting motion of the dust that has been irradiate by the electron beam. In this, we report on molecular dynamic simulations of this interaction. These simulations reproduce many of the observed experimental results and provide new insight into the interaction of the dust grains in a plasma crystal and an externally applied electron beam.

[1]This work is supported by National Science Foundation Grant Number PHY-1615420 (JW), project STAR 123, C3-2016 and PN-16-47-01-02 from the Romanian Ministery of Research and Inovation (C.M.T and D.T) and NSF EPSCoR CPU2AL project via grant number OIA-1655280 (LS and ET)

Jeremiah Williams
Wittenberg Univ

Date submitted: 29 Jun 2020 Electronic form version 1.4