

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**Measurements of the ion temperature and ion energy distribution in a linear pulsed plasma-material interaction test stand<sup>1</sup>**  
MICHAEL CHRISTENSON, SOONWOOK JUNG, CASEY BRYNIARSKI, KISHOR KALATHIPARAMBIL, DANIEL ANDRUCZYK, DAVID RUZIC, Univ of Illinois - Urbana — Critical components in understanding interactions between the highly transient plasma and target materials in the ThermoElectric-driven Liquid-metal plasma-facing Structures (TELS) device are the ion temperature and subsequent energy distribution, since the ions are nearly as energetic as the electrons under such extreme conditions. An electrostatic energy analyzer has been proposed and modified to extract this information under different pulse conditions in an effort to gain insight about plasma transport to the target region. The electrostatic analyzer was chosen as the most practical method for evaluating ion information in TELS, since it is suitable for measuring temperatures on the order of 10 to 100 eV. Accounting for high displacement current, recent results indicate ion temperatures on the order of  $19.95 \pm 1.39$  eV when applying a guiding magnetic field to improve transport, which are in good agreement with theoretical and experimental predictions subject to specific pulse conditions. The development and modification of the electrostatic analyzer are discussed in conjunction with recent modifications to the TELS device, including the addition of compact toroid magnetic fields used to generate a reversed field configuration.

<sup>1</sup>This project was supported under the US DOE project DOE-DE SC0008587.

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Date submitted: 11 Jul 2014

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