

Section: Magnetized HEDP

Investigation of Magnetically Insulated Transmission Lines Surface Plasma Temperature with a Novel Miniature X-ray Detector

TM Watson, DC Lamppa, N Bennett, D Welch, T Smith, JT Banasek, NR Hines, J Schwarz, JP Van Devender

A novel miniature X-ray detector (miniXRD) was used to measure the surface plasma temperature on MITLs. Initial discussion will include previous Z shot data from PF17 and PF18. As well as recent results on Mykonos a 1MA Linear Transformer Driver (LTD) at Sandia National Laboratories (SNL). Measurements made with the miniXRD allows spatial resolution of signature electric field driven plasma dynamics in the inner MITL at pulsed power facilities such as Z.

The miniXRD operates under the assumption of continuum radiation present in late time surface plasma. Results as a ride-along on Mykonos suggest non-equilibrium temperature distribution along the axial length of MITLs. Discussion of these experiments will include the isolation of continuum radiation from anode, cathode, and in-situ plasma cleaning effects on late time plasma formation. The plasma formation turn-on time data will be used as a modeling benchmark for surface plasma temperature in PIC based codes such as CHICAGO.

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