

(2)Group with other Proto-MPEX posters

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Experimental results from plasma transport on Prototype-Material Plasma Exposure eXperiment and comparison with B2-Eirene modeling¹ N. KAFLE, Univ of Tennessee, Knoxville, J.F. CANESES, T.M. BIEWER, L. OWEN, Oak Ridge National Lab., M. SHOWERS, D. DONOVAN, Univ of Tennessee, Knoxville, J.B. CAUGHMAN, R.H. GOULDING, JUERGEN RAPP, Oak Ridge National Lab. — Proto-MPEX at ORNL is a linear plasma device that combines a helicon plasma source with additional microwave and RF heating to deliver high plasma heat and particle fluxes to a target. Double Langmuir probes and Thomson scattering are being used to measure local T_e and n_e at various radial and axial locations. A recently constructed Mach- double probe provides the added capability of simultaneously measuring T_e , n_e , and Mach number. With this diagnostic, it is possible to infer the plasma flow, particle flux, and convective heat flux at different locations along the plasma column in Proto-MPEX. Preliminary results show Mach numbers of 0.6 and 0.8 in either direction away from the helicon source, and no flow near the source for the case where the peak magnetic field was 1.0 T. In addition, the Thomson Scattering system has been upgraded to measure n_e and T_e profiles at two axial locations, upstream at the electron heating location and downstream close to the target. Measurements of particle flow and flux profiles, heat flux, and profiles of n_e and T_e will be discussed. The extensive coverage provided by these diagnostics permits data-constrained B2-Eirene modeling of the entire plasma column, and comparison with results of modeling of high density mode plasmas will be presented.

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