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Power Balance Analysis of the Prototype-Material Plasma Exposure eXperiment[1] M.A. SHOWERS, ORNL/UT-Knoxville, T.M. BIEWER, J.F. CANESES, J.B.O CAUGHMAN, A. LUMSDAINE, L. OWEN, J. RAPP, D. YOUCHISON, ORNL, C.J. BEERS, D.C. DONOVAN, N. KAFLE, H.B. RAY, UT-Knoxville — The Prototype-Material Plasma Exposure eXperiment (Proto-MPEX) is a test bed for the plasma source concept for the planned Material Plasma Exposure eXperiment (MPEX), a steady-state linear device studying plasma material interactions for fusion reactors. A power balance of Proto-MPEX attempts to identify machine operating parameters that will improve Proto-MPEX's performance, potentially impacting the MPEX design concept. A power balance has been performed utilizing an extensive diagnostic suite to identify mechanisms and locations of power loss from the main plasma. The diagnostic package includes infrared cameras, double Langmuir probes, fluoroptic probes, Mach probes, a Thomson scattering diagnostic, a McPherson spectrometer and in-vessel thermocouples. Radiation losses are estimated with absolute calibrated spectroscopic signals.

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