

Abstract Submitted
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Simulation of plasma effects on rf power transport in vacuum waveguides¹ PETER STOLTZ, DAVID SMITHE, Tech-X Corporation — Researchers use rf power to heat tokamak plasmas and excite cavities for particle accelerators among other applications. Unwanted plasma can limit the power one can transmit from a source (such as a klystron) to the target (such as the tokamak plasma or the accelerating cavity). Researchers believe some possible sources for this plasma are ionization of residual gas or sputtering of material from the waveguide surface. We use computer simulation to model the effects of this plasma on the rf power transmission in a typical rf waveguide. In particular, we estimate using a coronal model the power radiated by ions in the plasma (these could be plasma ions or impurity ions). We calculate the ion density required to radiate all the incident rf power for various power levels up to 100 MW. We also use this density to estimate spot sizes on the waveguide surface, comparing these estimates with observations at the Stanford Linear Accelerator Center.

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