Abstract Submitted
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Mode Content Analysis for ITER gyrotron ECH Transmission Lines[1] ELIZABETH KOWALSKI, MICHAEL SHAPIRO, RICHARD TEMKIN, MIT Plasma Science and Fusion Center, TIMOTHY BIGELOW, DAVID RASMUSSEN, US ITER Project, ORNL — The Electron Cyclotron Resonance Heating system for ITER will require 20 MW of power from 24 1-MW gyrotrons at 170 GHz. Over-moded corrugated circular waveguides must transport this power with less than 14% loss. Launchers at the end of the waveguide into the tokamak require high precision alignment of the beam power. Small percentages of higher order mode content can cause a significant offset and tilt of the beam at the end of the waveguide, inhibiting the accuracy of the launchers. An analysis of mode content in transmission lines and mode conversion due to miter bends is necessary. We propose the use of two consecutive miter bends in the transmission line to mode convert a significant fraction of the unwanted higher order mode content into the fundamental HE_{11} mode. In order to properly shape these miter bend mirrors, the amplitude of the higher order modes must be known. We will present results showing that the LP_{11} mode content can be greatly reduced by tilting two consecutive miter bend mirrors.

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