

Abstract Submitted
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The HSX Hybrid Quasioptical Waveguide System¹ J.W. RADDER, K.M. LIKIN, F.S.B. ANDERSON, D.T. ANDERSON, J.N. TALMADGE, HSX Plasma Laboratory, University of Wisconsin-Madison, USA — Plasma formation and heating in the HSX stellarator is accomplished via 28 GHz ECRH. The ECRH transmission line has been upgraded recently from an over-sized wave-guide to a hybrid quasioptical line to increase maximum launched power and to reduce the chance of arcing. A Vlasov mode converter transforms the dominant TE_{02} gyrotron output mode to a Gaussian beam. The quasioptical portion of this system refocuses the beam, corrects the astigmatism, and rotates the beam polarization for X-mode or O-mode heating. A circular cross-section, dual-mode waveguide transmits microwave power from the quasioptical unit to the launching port where an ellipsoidal mirror refocuses the beam into the corrugated waveguide. This system has been successfully tested for 50 ms pulses with launched power up to 100 kW. Modal analysis of the microwave beam is accomplished with a thermal imaging technique which utilizes a ceramic target at various points along the beam path for 50 kW, 2 ms microwave pulses.

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