

Abstract Submitted
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Electron Cyclotron Heating System Upgrades on the HSX Stellarator¹ J.W. RADDER, D.T. ANDERSON, F.S.B. ANDERSON, K.M. LIKIN, J.N. TALMADGE² — Plasma formation and heating in the HSX stellarator is accomplished via 2nd-harmonic, X-mode ECRH at 28 GHz for 0.5T operations. The HSX ECRH system is being upgraded to include a new gyrotron and hybrid quasioptical transmission lines to provide a total maximum heating power of 400 kW. The primary goals of the new system are to increase the electron temperature with increased heating power, to vary the heating profile by heating on separate flux surfaces, and to perform ECRH modulation experiments. Vlasov converters transform the TE_{02} gyrotron output mode to Gaussian beams. A quasioptical systems comprised of metallic mirrors focus the Gaussian beams, correct astigmatisms, and rotate beam polarization for X-mode or O-mode heating. Circular cross-section, smooth-walled waveguides are used to traverse distances equal to a multiple of the TE_{11} , TM_{11} beat wavelength. Gaussian beams are launched into the HSX plasma with one stationary ellipsoidal mirror and one rotatable ellipsoidal mirror at toroidally separated boxports. Simulation, testing, and the current status of the new ECRH system will be presented.

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