

Abstract Submitted
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EBW Heating in the Helically Symmetric Experiment¹ KONSTANTIN LIKIN, Univ. of Wisconsin - Madison — On HSX the electron cyclotron resonance heating is made by the extraordinary (X) wave at 0.5 Tesla and/or by the ordinary (O) wave at 1 Tesla. The plasma density in ECRH experiments is always limited by a cut-off value. This limit has been overcome in other experiments with heating by Bernstein (B) waves. Possible heating scenarios in overdense HSX plasmas are of a great interest. A ray tracing code is used to model the propagation and absorption of electron cyclotron waves in the 3- D geometry of the HSX stellarator. The dispersion relation for the electron Bernstein wave has been incorporated into the ray tracing code. The O-X-B and/or direct X-B conversions in launching the microwave power from the low or high magnetic field sides have been explored. A target plasma can be made by a microwave source at 60 GHz while the second 28 GHz source will be used for EBW heating. The overall O-X-B conversion efficiency can be high (about 0.8) in the vicinity of the box port while the Bernstein wave in HSX plasmas ($T_e=2$ keV) is absorbed outboard at $r/a_p=0.5$ when $N_{par}=0.5$ and even further out at higher N_{par} .

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