Abstract Submitted
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Electron Heating of a Field Reversed Configuration at the Upper Hybrid Resonance Frequency EUSEBIO GARATE, Tri Alpha Energy, Inc., LOTHAR SCHMITZ, UCLA, ERIK TRASK, XIAOKANG YANG, Tri Alpha Energy, Inc., ALEXANDER SHALASHOV, ALEXEY BALAKIN, EGOR GOSPODCHIKOV, GREGORY DENISOV, ALEXANDER LITVAK, Institute of Applied Physics, RAS, FOR THE TAE TEAM — Field reversed configurations (FRC) have closed field line regions in which the ratio of plasma to cyclotron frequencies is greater than 1. Usual electron heating scenarios, such as electron cyclotron resonance heating, cannot be used. Electron Bernstein wave coupling is a possible heating mechanism for such overdense plasma, as is heating at the upper hybrid resonance (UHR). Analytic and full wave calculations using simulated C-2[1] density and magnetic field profiles indicate $> 90\%$ coupling is theoretically possible at the UHR. Initial measurements have been carried out on C-2 to assess microwave absorption in the frequency range where upper hybrid electron heating would be expected according to the calculations. A Gaussian beam ($2W_0 \sim$ 4-6 cm) is launched using monostatic beam optics (40-60 GHz) and the reflected/ absorbed power is measured. O-mode and X-mode launches will be compared to discriminate O-X-B mode conversion/absorption. We will discuss both the theoretical and experimental results carried out on C-2.

[1] M. Tuszewski et al., Phys. Rev. Lett. 108, 255008 (2012)

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