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Simulations of microwave electron heating on field-reversed configuration driven by rotating magnetic field XIAOKANG YANG, Tri Alpha Energy, YURI PETROV, CompX, ALF KOEHN, Max Planck Institute for Plasma Physcis, SAM COHEN, Plasma Physics Laboratory, Princeton University, FRANCESCO CECCHERINI, LAURA GALEOTTI, SEAN DETTRICK, MICHL BINDERBAUER, Tri Alpha Energy — The rotating magnetic field-driven field-reversed configuration (FRC), such as Rotamak [1] or PFRC experiment [2], was recently proposed as a test bench at Tri Alpha Energy to experimentally pioneer the study of microwave electron heating. In order to provide guidelines to the choice of microwave frequency and antenna position, as well as the desired target plasma profile, extensive simulations have been conducted with use of the GENRAY-C ray-tracing code for a wide range of frequencies from smaller than fundamental electron cyclotron resonant (ECR) frequency up to more than 30 harmonics of ECR. Based on the operational parameters of Rotamak plasma, simulations indicate that microwaves at a frequency around 10 GHz can heat electrons inside the separatrix layer. The physics of heating mechanism is similar for both the Rotamak and the C-2U [3] FRC plasma, meaning that the magnitude of magnetic field goes down along the direction of ray propagation, therefore the rays, after the O-X-B mode conversion, encounter a basin of high harmonic EC resonances and mostly damp the power in the vicinity of the upper-hybrid resonance layer Detailed simulation results and plans for a future test bench will be presented. [1] X. Yang, et al., PRL 102, 255004 (2009) [2] S. A. Cohen et al., PRL 98, 145002 (2007) [3] M. W. Binderbauer et al., PoP 22, 056110 (2015)

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