

Abstract Submitted
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PIC simulations of interaction between ICRF waves and edge plasma¹ NONG XIANG, University of Colorado at Boulder and Inst. of Plasma Physics, CAS, JOHN R. CARY, University of Colorado at Boulder and Tech-X Corp., DAVID SMITHE, TRAVIS AUSTIN, Tech-X Corp. — The interaction between ion-cyclotron-range of frequencies (ICRF) waves and edge plasma has been intensively studied in recent years to understand the effect on ICRF heating. It has been observed experimentally that the incident wave deposits its energy at plasma edge. It is generally believed that the sheaths formed by the interactions between ICRF waves and the conducting surfaces of the antenna affect ICRF heating in an unfavorable way and cause the boundary absorption of the wave[1]. Theoretical models have been proposed to account for the detrimental effects; however, experimental observations suggest that in some cases, nonlinear plasma-wave interactions such as parametric decay instabilities near the boundary are also important to the wave absorption. In this work, full-PIC simulations using the VORPAL computational framework [2] of ICRF heating experiment with parameters of the EAST tokamak are presented. The effects of the sheaths as well as the nonlinear plasma-wave interaction near plasma edge on ICRF heating are explored and discussed. [1] Myra J R., D'Ippolito D A., Berry L.A, Jagger E F and Carter M D, Nucl. Fusion 46, S455 (2006). [2] C. Nieter and J. R. Cary, J. Comp. Phys. **196**, 448-472 (2004).

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