

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**ICRF Actuator Development for Alcator C-Mod and ADX<sup>1</sup>** W.M. BECK, S.J. WUKITCH, P. KOERT, B. LABOMBARD, Y. LIN, R. VIEIRA, J. TERRY, MIT PSFC, AND ALCATOR C-MOD TEAM — Future fusion reactors will present more severe constraints on ion cyclotron range of frequency (ICRF) actuators than ITER or present day experiments. One challenge to ICRF utilization is its interaction with the edge plasma, particularly impurity contamination and enhanced localized heat loads. Another is maintaining high coupled power through plasma variations, with high power density and antenna materials compatible with a nuclear environment. The RF plasma edge interaction is thought to be linked to RF electric fields parallel to the magnetic field,  $E_{||}$ . Experiments comparing a field aligned (FA), minimized integrated  $E_{||}$ , and a toriodally aligned (TA) antenna have demonstrated the FA antenna has significantly reduced impurity contamination and antenna impurity source compared to the TA antennas. The FA antenna also shows load tolerance we speculate to be a result of reduced slow wave coupling between straps and reduced RF induced heat flux. Latest results and analysis will be presented including further optimization that can be realized by locating the antenna to the high field side due to the inherent impurity screening observed in near double null configuration.

<sup>1</sup>Supported by US DOE award DE-FC02-99ER54512

Stephen Wukitch  
MIT PSFC

Date submitted: 11 Jul 2014

Electronic form version 1.4