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Field Aligned Antenna Performance Evaluation in Alcator C-Mod¹ STEPHEN WUKITCH, MIT PSFC, I. CZIEGLER, UCSD, M.L. GARRETT, C. LAU, Y. LIN, B. LIPSCHULTZ, D. MILLER, R. OCHOUKOV, M.L. REINKE, J.L. TERRY, MIT PSFC, A. TRONCHIN-JAMES, LLNL, D. WHYTE, MIT PSFC, AND ALCATOR C-MOD TEAM — We have installed a new field aligned antenna designed to minimize impurity production by imposing symmetry along the total magnetic field line. Using the standard antennas (ST) as a reference, the impurity contamination and sources in both L and H-mode are significantly lower for the FA-antenna. In both L and H-mode the radiated power is reduced for given injected power for the FA-antenna compared to the ST-antennas. The antenna has achieved voltages up to 45 kV and power density up to 9.6 MW/m² where the power density is limited by the maximum sustainable voltage. In addition to high voltage limits, we have often observed maximum voltage degradation at high neutral pressure, so-called neutral pressure limit. The FA-antenna's neutral pressure limit is at least twice that of the ST antennas likely due to larger vacuum feedthrus. An unexpected result is that the FA antenna appears to be more load tolerant than ST antennas. We have also observed that low Z impurity seeding reduces antenna faulting in a manner similar to the ST antennas. Using an extensive array of core and boundary plasma diagnostics, the latest assessment of the antenna performance including impurity characteristics, impact on the SOL transport and SOL density profiles will be presented.

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