

Abstract Submitted
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ICRF Antenna Optimization for Alcator C-Mod¹ M.L. GARRETT, S.J. WUKITCH, W. BECK, P. KOERT, Y. LIN, R. PARKER, MIT PSFC — Two major challenges for ICRF utilization are reducing impurity generation and increasing reliability at high voltages. In Alcator C-Mod, we are designing a rotated 4-strap antenna where we seek to lower E-parallel and improve voltage handling. Simulations were conducted to analyze the effect of antenna orientation on the parallel electric field, which is thought to influence impurity production. In addition, simulations were carried out on antenna box and limiter structures with particular emphasis on parallel electric field reduction through image current modification. Antenna septum and limiter thickness, position, and separation were varied. The effect of slotting antenna limiters and antenna box walls was also investigated. Previous experiments suggest that improved voltage handling may be obtained through the use of refractory metals compared with copper. A test stand has been designed and built to characterize ICRF relevant voltage breakdown as a function of: antenna material, neutral pressure, and magnetic field orientation. Results from simulations and experiments will be presented along with details of the new antenna design.

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