Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Retarding Field Analyzer and Ion Sensitive Probe for Boundary Plasma Profile Measurements in Alcator C-Mod: Design and Initial Results[1] DAN BRUNNER, BRIAN LABOMBARD, ROMAN OCHOUKOV, DENNIS WHYTE, MIT PSFC — We are developing two new scanning probe heads to measure the ion and electron distribution functions and plasma potential. The Ion Sensitive Probe (ISP) is a Katsumata style probe: the difference in gyro-radii of electrons and ions is used to scrape off the electrons such that the ion distribution function perpendicular to the magnetic field and plasma potential may be deduced. A domed Langmuir probe is included in the head to measure electron temperature and density. The Retarding Field Analyzer (RFA) measures electron (EEDF) and ion energy distribution functions (IEDF) parallel to the magnetic field (in both directions) as well as plasma potential and density. Of particular interest is the response of the boundary layer (EEDF and plasma potential) to Lower Hybrid (LH) waves. For this purpose, an additional stationary RFA has been placed on a limiter that connects magnetically to a LH launcher. Design considerations for handling the large heat flux (100's MW/m^2), space charge effects and small signal levels ($\sim \mu$A) along with initial measurements will be presented.

[1]Supported by USDoE award DE-FC02-99ER54512.

Dan Brunner
MIT PSFC

Date submitted: 13 Jul 2011 Electronic form version 1.4