Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Investigations of Impurity Penetration and Transport with the Application of ICRF Power[1] J.L. TERRY, S.J. WUKITCH, MIT-PSFC, M.L. REINKE, ORNL, B. MUMGAARD, M.A. CHILENSKI, D. BRUNNER, B. LABOMBARD, MIT-PSFC, C-MOD TEAM — High power ICRF heating has typically been accompanied by elevated core impurity concentrations. The causes of this have been variously attributed to increased impurity sources due to RF-enhanced sputtering, to increased impurity penetration due to ICRF-induced potentials and convention cells in the far-SOL, or to a combination of these effects. In Alcator C-Mod ICRF-induced potentials are observed in the far-SOL both locally (i.e. along flux tubes that intersect or pass in front of an energized ICRF antenna) and globally (i.e. in regions that are not magnetically connected to an energized antenna). We have performed experiments to investigate these effects by puffing known amounts of N impurity from four locations that have different mappings to an ICRF antenna energized to stepped power levels. We find no significant change in the penetration efficiency for the locally-puffed impurity with the ICRF power level, even though the local ICRF-induced potentials are present at the puff location, and we take this as evidence that these potentials do not directly enhance impurity penetration. Nonetheless, we observe that the core concentrations of non-puffed impurities are well correlated with the ICRF power. We interpret this to be a result of source enhancement or penetration enhancement by the ICRF at locations other than the four tested puff locations.

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

James Terry
MIT-PSFC

Date submitted: 23 Jul 2015 Electronic form version 1.4