

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Progressive recycling reduction with Li aerosol injection in EAST

J.M. CANIK, ORNL, Z. SUN, J.S. HU, G.Z. ZUO, W. XU, M. HUANG, ASIPP, R. MAINGI, R. LUNSFORD, A. DIALLO, D.K. MANSFIELD, PPPL, X.C. MENG, HU, T. OSBORNE, GA, K. TRITZ, JHU, EAST TEAM — Recent experiments at the EAST tokamak have shown a strong reduction in divertor recycling when lithium is injected into the plasma, with tungsten used as the wall material in the active divertor. These extend previous studies using carbon as the wall material onto which lithium is applied, and test the ability to use lithium aerosol injection for active wall conditioning during long-pulse plasmas. Reduced recycling, as evidenced by D α emission, is observed during the lithium injection, qualitatively like that observed in other experiments using pre-discharge lithium deposition. The magnitude of the reduction increases with the lithium injection rate, with up to a factor of ~ 2 observed. The recycling reduction is most pronounced in the active divertor, consistent with the aerosol being transport by the plasma preferentially to the strongly plasma-wetted regions. In contrast, ion flux is affected more weakly, decreasing by less than 20% under lithium injection. Modeling with the SOLPS plasma/neutrals transport code indicates a relative reduction in the divertor recycling coefficient of $\sim 20\%$ (e.g., $R=0.99$ to 0.8) with lithium injection. These results show the potential for lithium injection to provide real-time control of recycling and particle removal via surface pumping. *US scientists supported by U.S. DOE Contracts DE-AC05-00OR22725, DE-AC02-09CH11466, DE-FC02-04ER54698, and ASIPP scientists by Contract Nos. 2017YFA0402500, 11625524, 11075185, 11021565, 2013GB114004.

John Canik
ORNL

Date submitted: 14 Jul 2017

Electronic form version 1.4