Improved NSTX Plasma Performance with Lithium Aerosol Injection

DENNIS MANSFIELD, LANE ROQUEMORE, HENRY KUGEL, PPPL, RAJESH MAINGI, ORNL, NSTX TEAM — Elemental lithium in the form of dry aerosol particles has been injected continuously into the scrape-off layer of NSTX discharges in an attempt to affect H-Mode performance by real-time wall conditioning. The average particle diameter was 44 microns and typical injection fluxes were in the range of 1 – 30 mg/sec. In all cases, the discharges were remarkably tolerant of this method of introducing lithium and plasma parameters were generally improved. However, especially significant reductions in OH flux consumption, ELMS amplitude and D$\alpha$ emission were accompanied by an increase in plasma confinement when lithium injection began prior to the L-H transition.

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