

Gas Balance D retention with LLD

Plan:

- As 2009 XP911 gas balance but now with LLD.
- 1/2 run day ohmic.
- 1/2 run day NB heated discharges.
- Repeat with LLD cold and with molten Li. See if pumping changes.
- Outer strike point on bull-nose outer divertor tiles.
- Surface analysis: Sample probe with graphite and LLD samples.
- Evening in-vacuo Thermal Desorption Spectroscopy of graphite sample.

- Milestone FY2011 Research Milestone R(11-3)::
 - "Develop and understand high-performance operating scenarios utilizing a liquid lithium divertor (LLD) for particle control."
 - "D retention will be studied as a function of surface conditions such as lithium coverage and LLD surface temperature."
 - "an in-situ materials analysis particle probe placed near the LLD will provide measurements of retention and surface composition in the outer divertor region for selected shots."

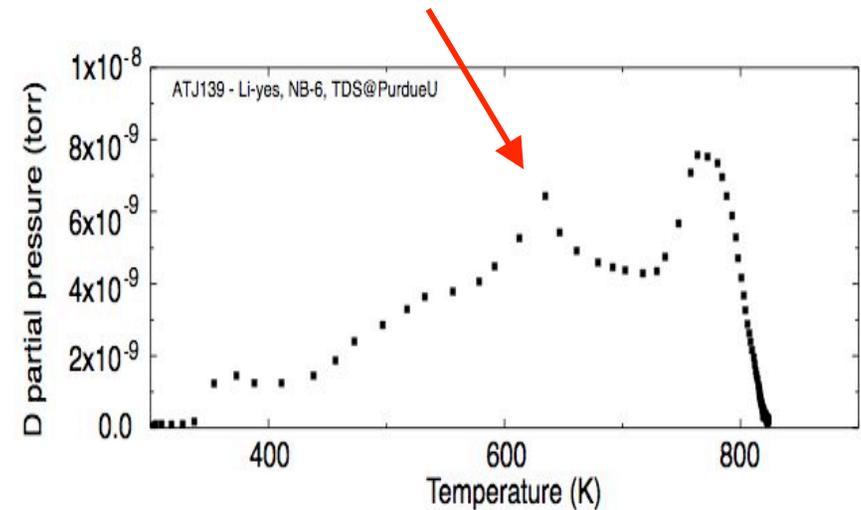
- Run time needed: ~1-2 days (1/4 day in April for PSI19 in May).

PMI probe - D retention- complete Joule Milestone for PSI19

Motivation:

- Completion of XP911 retention FY09 milestone for PSI-19 publication (May 2010).
- Thermal desorption spectroscopy (TDS) at Purdue showed a new low temperature peak that may be behind the prompt D release after NSTX pulse.
- Same-evening TDS at NSTX was compromised by poor temperature control (simultaneous commissioning and experiment) and conduction of heat to other samples.
- Plan to repeat measurements with upgraded equipment.
- This part needs $>\sim 1/4$ d + evening early in campaign.

Purdue TDS: 600 K peak with Li has weaker bonding of D 'in solution'.



ATJ132 NB pre-Li TDS @ NSTX
NSTX TDS: Lack of temperature control

