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NSTX Metallic Impurity Accumulation, Helium Retention, and Operation Issues

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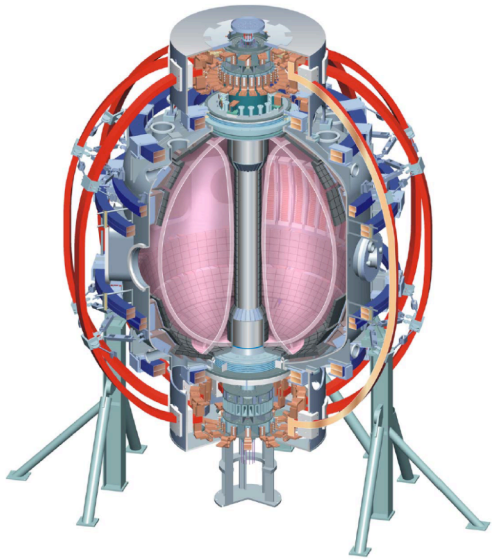
NSTX Program Meeting
Aug 09, 2007
PPPL, Princeton, NJ



PPPL PRINCETON PLASMA PHYSICS LABORATORY

Overview of the Issues

• NSTX lithium research is aimed towards sustaining the current non-inductively in H-mode plasmas which requires control of *both* long pulse ***density rises*** and ***impurity influxes***.

• Program Issues from FY07 Experimental Campaign

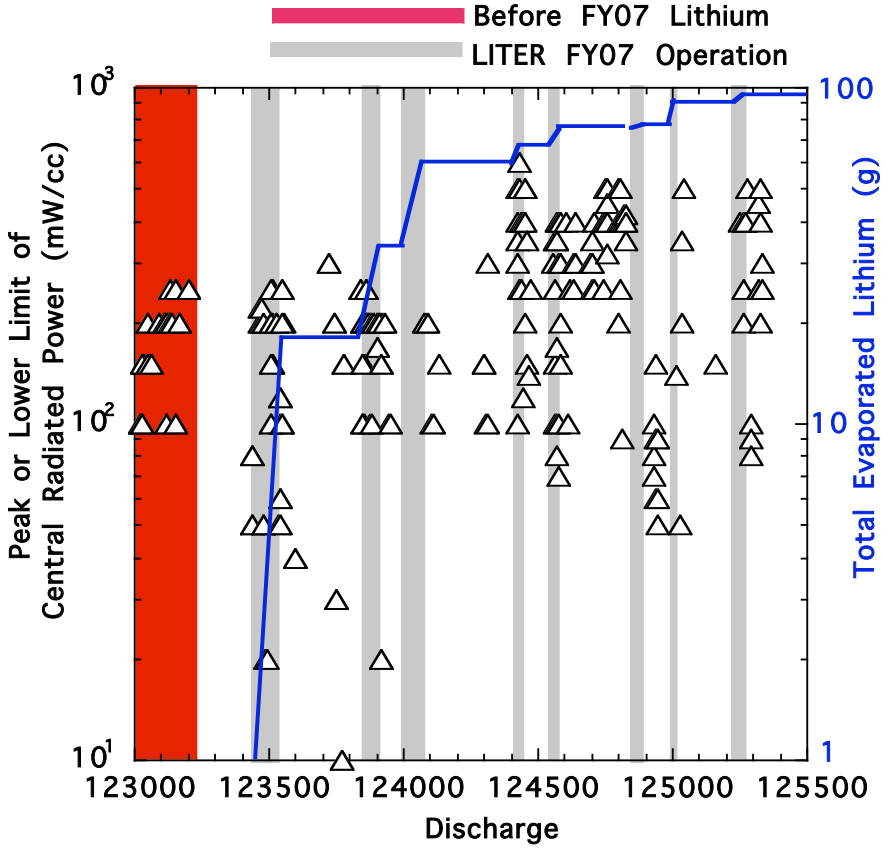
1) 15-40% reductions in n_e yet $dn_e/dt \neq 0$

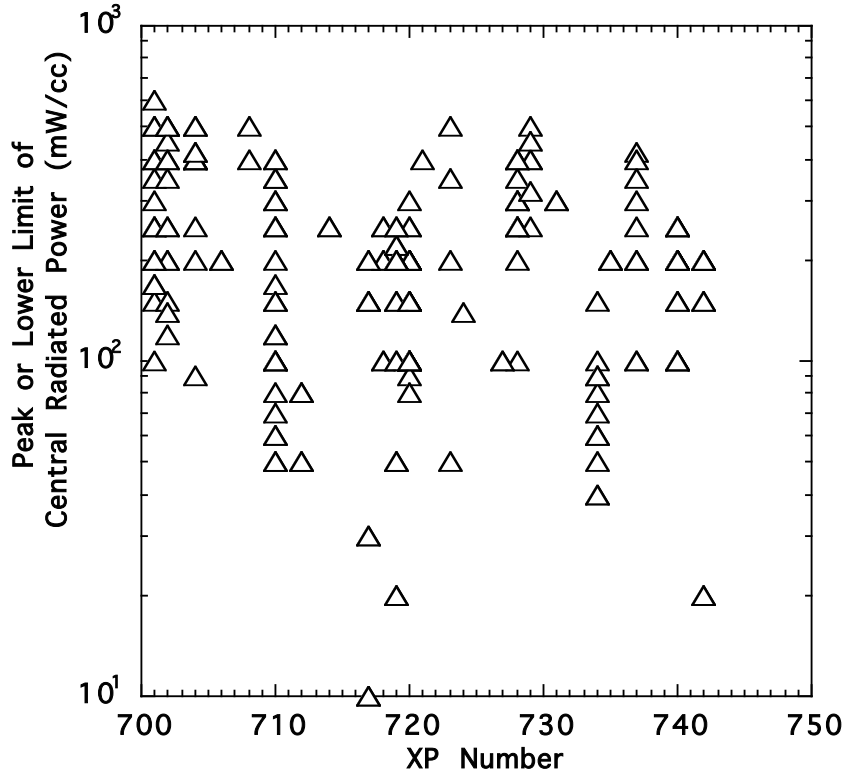
This Meeting ➤ 2) Increasing core radiation with Shot Number

This Meeting ➤ 3) Helium retention due to Li evaporation into HeGDC

This Meeting ➤ 4) Control issues

Discharges With High Central Radiated Power Occurred More Frequently and With Increasing Intensely with Shot Number





Issue: What are the sources of this high central radiated power:

- LITER operation (metal impurities from LITER?)
- machine operation (disruptions, shape, outer gap, startup, low n_e edge?)
- improving confinement (native impurities, ELM Free H-modes,..?)

This meeting will focus on presentations and discussion of work in progress on these and related issues

- *Agenda*
- Introduction - H. Kugel
- SEM K-Xray Analysis of Silicon Coupon and Li Sample - H. Kugel
- Photos of Candidate In-vessel Metallic Sources - L. Roquemore
- Accumulation of Metallic Impurities - S. Paul and J. Robinson
- Lithium Effects on Edge Neutral Density - P. W. Ross
- Fast Ion Loss in NSTX - D. Darrow
- Disruptions in NSTX - S. Gerhardt
- Helium Retention in NSTX - V. Soukhanovskii (LLNL)
- Operation Issues - D. Mueller

- *Goals*

- Action Items for immediate implementation during the Opening if needed for completion by the October Pumpdown.