

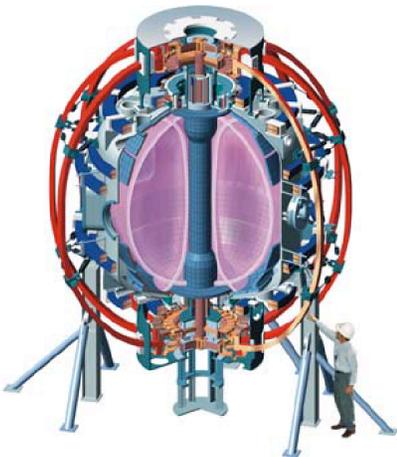
NSTX Research Forum

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Perspectives on Boundary Physics Research '04

H. W. Kugel



NSTX Research Forum, Nov 2003

H.Kugel

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Planning Guidance



• IPPA Five Plan Guidance

a) The 5 Year IPPA Boundary Physics Objectives on Spherical Torus (3.2.1)

b) The 5 Year IPPA Tokamak Boundary Physics Objectives (3.1.4)

- *Plasma Edge Physics* (3.1.4.1)

- *Coupling Between Edge and Core Plasmas* (3.1.4.2)

- *Plasma-wall Interaction* (3.1.4.3)

• NSTX Contributions to ITPA Divertor and SOL High Priority Research Areas 2003-2004

- Real-time measurements of hydrocarbon deposition with a quartz microbalance. Recycling flux from the wall and divertor will be monitored from measurements of H-alpha emission recorded with a 1D CCD camera.

- Investigate the nature and magnitude of perpendicular transport (diffusive vs. intermittent) and the resulting SOL widths using a fast reciprocating probe, SOL reflectometer, and other turbulence measurements. Simulation of these data will be done with analytic models, a 2-D fluid code with various cross-field transport models, and a 3-D turbulence code.

Boundary Physics New Capabilities '04



- **Supersonic Gas Injector (for fueling and edge diagnostics)**
- **Low-Z Pellet Injector (Li, B, C...)**
- **Poloidal Gas-puff Fueling Array (commissioned FY'03)**
- **Poloidal Neutral Pressure Gauge Array**
- **Divertor Tangential Fast Camera**
- **Midplane Quartz Deposition Monitor (commissioned FY03)**
- **Lower Divertor Electrostatic Dust Detector**
- **In-situ Illumination Source (Window Transmission Measurements)**
- **Boronization During Bakeout (“Hot Boronization”)**
- **Morning Boronization (“Daily Boronization” as required)**
- **Port/Valve for Lithium Evaporation Probe (near end of Run)**

Agenda Boundary Physics ET, Breakout Session

Tuesday, November 11, 2003, 1:30-6:30pm, Director's Conf. Room



- 1:30-1:40pm Introduction and Run-Time Allocation - H.Kugel**
- 1:40-1:55pm Boundary Physics Group Experimental Proposal - S. Paul**
- 1:55-2:10pm UCSD Activities at NSTX - S.Zweben for J.Boedo**
- 2:10-2:25pm Boundary GPI Measurements in FY04 – S.Zweben**
- 2:25-2:40pm Blobs and Convective Transport in Theory and Experiment – J.R. Myra**
- 2:40-2:55pm Extend SOL Radial Transport Analysis to an ST – B. Lipschultz**
- 2:55-3:10pm Supersonic Gas Injector Fueling - V.Soukhanovskii**
- Supersonic Gas Injector Diagnostic Applications - V.Soukhanovskii**
- Divertor Detachment Measurements and Modeling - V.Soukhanovskii**
- Carbon Sources and Edge Transport - V.Soukhanovskii**
- Neutral Gas Leakage Paths During Discharges - V. Soukhanoskii**

Agenda Boundary Physics ET, Breakout Session

Tuesday, November 11, 2003, 1:30-6:30pm, Director's Conf. Room



- 3:10-3:25pm** **Divertor Tangential Fast Camera Experiments – L. Roquemore**
- 3:25-3:40pm** **Density Control Through Plasma Termination Control – C.Skinner**
- Deposition Measurements in NSTX – C.Skinner**
- 3:40-3:55pm** **Hot Boronization - H.Kugel**
- Daily Cold Boronization as Required- H.Kugel**
- Characterization of Low-Z Pellet Injection – H.Kugel**
- Particle Control Using Lithium Wall Coatings via Pellet Injection - H. Kugel**
- 3:55-4:10pm** **Lithium Coating of the NSTX Outer Divertor Tiles via Evaporators– R.Majeski**
- 4:10-4:25pm** **Tests of Evaporative Coatings on NSTX PFC's– S. Luckhardt**
- 4:25-4:40pm** **Future Fueling Requirements for High Bootstrap Current Discharges– R. Raman**
- 4:40-4:55pm** **Deuterium Pellet Fueling Scoping Studies for NSTX – L.R. Baylor**

Agenda Boundary Physics ET, Breakout Session

Tuesday, November 11, 2003, 1:30-6:30pm, Director's Conf. Room



- 4:55-5:10pm** **Heat and Particle Flux Scaling (vs Power, Density, Current, shape) - R.Maingi**
- 5:10-5:25pm** **Implementing Nonlocal Effects on Parallel Heat Flow in UEDGE
– D. Stotler for J.P. Matte**
- 5:25-5:40pm** **Simple as Possible Plasma Discharges on NSTX – A.Pigarov**
- Scaling Studies for Cross-Field Edge Plasma Transport – A.Pigarov**
- Impurity Transport In NSTX Edge Plasma – A.Pigarov**
- 5:40-6:30pm** **Discussion and Prioritization for Allotted Run Time - R.Kaita**