Princeton Plasma Physics Laboratory

NSTX Experimental Proposal

Title: Evaluate Short Morning Boronization for Stable Conditions

OP-XP-???	**Revision:**	Effective Date: *(Ref. OP-AD-97)* Expiration Date: *(2 yrs. unless otherwise stipulated)*

PROPOSAL APPROVALS

Author: H.Kugel	Date
ATI – ET Group Leader: H.Kugel, R.Kaita	Date
RLM - Run Coordinator: S.Kaye	Date
Responsible Division: Experimental Research Operations, M.Bell	

Chit Review Board (designated by Run Coordinator)

MINOR MODIFICATIONS (Approved by Experimental Research Operations)

NSTX EXPERIMENTAL PROPOSAL

Title: Evaluate Short Morning Boronization for Stable Conditions
OP-XP-???

1. Overview of planned experiment

- 19 Routine NSTX Boronizations have facilitated operations
  - Application Frequency: ~2-3 weeks, (~300-400 discharges)
  - Application Amount: 10 g
  - Application Process: ~ 150 min

- This XP is to evaluate using short TMB Boronization in the morning (e.g.~10-15 min, ~ 1g) to repair recent erosion as required for stable operating conditions.

2. Theoretical/ empirical justification

19 Routine NSTX Boronizations have facilitated operations. The use of occasional or routine 15 minute Morning Boronization may maintain stable operating conditions.

3. Experimental run plan

- Wait for clean machine conditions mid-run (after ~3rd std boronization)

- 6 Fiducials before (0.2 day), 6 Fiducials after (0.2 day)

4. Required machine, NBI, RF, CHI and diagnostic capabilities

- Same as for evaluation of room temperature boronization, i.e. OP-XMP-09, "NSTX Boronization".

5. Planned analysis

Spectroscopic data, bolometry, x-ray, Tau-E, Tau-P*, stored energy.

6. Planned publication of results

The results will be presented at PSI 2004.

DIAGNOSTIC CHECKLIST

Title: Evaluate Short Morning Boronization for Stable Conditions

Diagnostic	Need	Desire	Instructions
Bolometer – tangential array		X	
Bolometer array - divertor	X		
CHERS	X		
Divertor fast camera	X		
Dust detector	X		
EBW radiometers			
Edge deposition monitor	X		
Edge pressure gauges	X		
Edge rotation spectroscopy	X		
Fast lost ion probes - IFLIP	X		
Fast lost ion probes - SFLIP	X		
Filtered 1D cameras	X		
Filterscopes	X		
FIReTIP			
Gas puff imaging			
Infrared cameras	X		
Interferometer - 1 mm	X		
Langmuir probe array			
Magnetics - Diamagnetism	X		
Magnetics - Flux loops	X		
Magnetics - Locked modes			
Magnetics - Pickup coils	X		
Magnetics - Rogowski coils	X		
Magnetics - RWM sensors			
Mirnov coils – high frequency	X		
Mirnov coils – poloidal array	X		
Mirnov coils – toroidal array	X		
MSE			
Neutral particle analyzer			
Neutron measurements	X		
Plasma TV	X		
Reciprocating probe		X	
Reflectometer – core			
Reflectometer - SOL			
RF antenna camera			
RF antenna probe	X		
SPRED	X		
Thomson scattering	X		
Ultrasoft X-ray arrays	X		
Visible bremsstrahlung det.	X		
Visible spectrometers (VIPS)	X		
X-ray crystal spectrometer - H	X		
X-ray crystal spectrometer - V	X		
X-ray PIXCS (GEM) camera			
X-ray pinhole camera	X		
X-ray TG spectrometer		X	

PHYSICS OPERATIONS REQUEST

Title: **Evaluate Short Morning Boronization for Stable Conditions**
No. (from OP-XMP-09, Rev.1)

Machine conditions (indicate range where appropriate):

TF: Flattop (kA) __35____Flattop start/stop (s) _0-0.4_____

I_p: Flattop (kA) _750_____Flattop start/stop (s) __0.03-0.23_____

Position: Outer gap _7cm_____Z (m) __0____ Inner wall / Single null / Double null

Gas: Prefill _He,0.0_____Puff _He, 0.0_____

NBI:Power (MW) __N/A____ Start / stop (s) _____ Voltage (kV) _____

RF:Power (MW) __N/A____ Start / stop (s) _____ Frequency (MHz) _____

CHI: Off / Start-up / Ramp-up / Sustainment

If this is a continuation of a previous run or if shots from a previous run are similar to those needed, provide shot numbers for setup

102885 (He)

Outer Gap may need mod

If shots are new and unique, sketch desired time profiles and shapes. Accurately label the sketch so there is no confusion about times or values. Attach additional sheets as required.

PHYSICS OPERATIONS REQUEST

Title: Evaulate Boronization During High Temperature Bakeout
No. (from OP-XMP-09, Rev.1)

Machine conditions (indicate range where appropriate):

TF: Flattop (kA) __35____Flattop start/stop (s) _0-0.4_____

I_p: Flattop (kA) _750_____Flattop start/stop (s) __0.03-0.23_____

Position: Outer gap _7cm_____Z (m) __0____ Inner wall / Single null / Double null

Gas: Prefill _D2,0.0_____Puff _D2, 0.0_____

NBI:Power (MW) __N/A____ Start / stop (s) _____ Voltage (kV) _____

RF:Power (MW) __N/A____ Start / stop (s) _____ Frequency (MHz) _____

CHI: Off / Start-up / Ramp-up / Sustainment

If this is a continuation of a previous run or if shots from a previous run are similar to those needed, provide shot numbers for setup

D2, typ.

Outer Gap may need mod.

If shots are new and unique, sketch desired time profiles and shapes. Accurately label the sketch so there is no confusion about times or values. Attach additional sheets as required.