

**Princeton Plasma Physics Laboratory
NSTX Machine Proposal**

Title: Transmission Grating Spectrometer Commissioning

OP-XMP-58

Revision: 1.0

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

Procedure Approvals

Responsible author:

Date

ATI (NSTX Physics Ops):

Date

RLM (NSTX Expt. Research Ops):

Date

Responsible Division: **Experimental Research Operations**

Procedure Requirements
designated by RLM

	NSTX Work Permit		T-MOD (OP-AD-03)
	Independent Review		ES&H Review

MINOR MODIFICATIONS

REVIEWERS (designated by RLM)		
<u>Organization/Position</u>	<u>Name</u>	<u>Signature</u>
ATI		
Test Director		
Independent Reviewer		
NB		
RF		
Diagnostics		

TRAINING (designated by RLM)			
Training required: No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Instructor _____			
Personnel (group, job title or individual name)	Read Only	Instruction	Hands-On
Training Rep. _____			

RLM _____

NSTX MACHINE PROPOSAL

TITLE: Transmission Grating Commissioning	No. OP-XMP-58
AUTHORS: K. Tritz, D. Stutman, L. Delgado-Aparicio	DATE: 06/23/08

1. Overview:

The purpose of this XMP is to provide a low density, RF-heated target plasma to obtain spatial resolution of impurity and X-ray emission from the transmission grating spectrometer. This data will be used to verify proper operation, and provide intensity information.

2. Justification:

The TG spectrometer will be used to monitor various impurity concentrations in NSTX.

3. Plan:

~8 shots using 128251 as a baseline. Diagnostic pressure will be monitored, and prefill pressure will be lowered if necessary.

TG voltages will be scanned to optimized signal intensity.

Shot range

4. Required machine, beam, ICRF and diagnostic capabilities:

No NBI injection, RF power as in shot 128251. Standard diagnostics are desired.

5. Sign off at run time:

5.1 Permission to Proceed:

Physics Operations Head

5.2 Documentation of results:

Documentation of the results completed, attached to proposal and sent to Ops. Center with copies to Cognizant Physicist and Head of Physics Operations.

Cognizant Physicist/Test Director

PHYSICS OPERATIONS REQUEST

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Machine conditions (specify ranges as appropriate)

I_{TF} (kA): **-65** Flattop start/stop (s): **-0.02 / 0.6**

I_p (MA): **0.65** Flattop start/stop (s): **0.15 / 0.5**

Configuration: **LSN**

Outer gap (m): **0.05** Inner gap (m):

Elongation κ : Upper/lower triangularity δ :

Z position (m):

Gas Species: Injector(s):

NBI Off

ICRF Power (MW): 1 Phasing: **0π** Duration (s): **0.2**

CHI: Off

LITER: Off

Previous shot numbers for setup: **128251**

DIAGNOSTIC CHECKLIST

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Note special diagnostic requirements in Sec. 4

Diagnostic	Need	Want
Bolometer – tangential array		√
Bolometer – divertor		
CHERS – toroidal		
CHERS – poloidal		
Divertor fast camera		
Dust detector		
EBW radiometers		
Edge deposition monitors		
Edge neutral density diag.		
Edge pressure gauges		
Edge rotation diagnostic		
Fast ion D_alpha - FIDA		
Fast lost ion probes - IFLIP		
Fast lost ion probes - SFLIP		
Filterscopes		√
FIReTIP		√
Gas puff imaging		√
H α camera - 1D		
High-k scattering		
Infrared cameras		
Interferometer - 1 mm		
Langmuir probes – divertor		
Langmuir probes – BEaP		
Langmuir probes – RF ant.		
Magnetics – Diamagnetism		√
Magnetics – Flux loops	√	
Magnetics – Locked modes		
Magnetics – Pickup coils	√	
Magnetics – Rogowski coils	√	
Magnetics – Halo currents		
Magnetics – RWM sensors		
Mirnov coils – high f.		
Mirnov coils – poloidal array		
Mirnov coils – toroidal array		
Mirnov coils – 3-axis proto.		

Note special diagnostic requirements in Sec. 4

Diagnostic	Need	Want
MSE		
NPA – ExB scanning		
NPA – solid state		
Neutron measurements		
Plasma TV		√
Reciprocating probe		
Reflectometer – 65GHz		
Reflectometer – correlation		
Reflectometer – FM/CW		
Reflectometer – fixed f		
Reflectometer – SOL		
RF edge probes		
Spectrometer – SPRED		√
Spectrometer – VIPS		√
SWIFT – 2D flow		
Thomson scattering	√	
Ultrasoft X-ray arrays	√	
Ultrasoft X-rays – bicolor		
Ultrasoft X-rays – TG spectr.	√	
Visible bremsstrahlung det.	√	
X-ray crystal spectrom. - H		
X-ray crystal spectrom. - V		
X-ray fast pinhole camera		
X-ray spectrometer - XEUS		√