

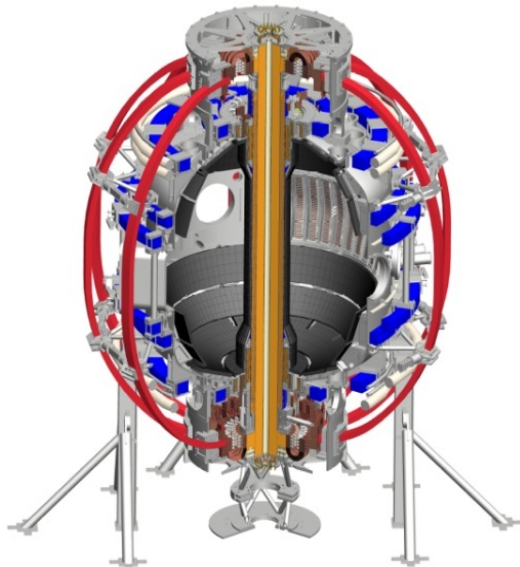
NSTX-U Five Year Plan: Chapter 6 Status

*Coll of Wm & Mary
 Columbia U
 CompX
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 Nova Photonics
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 X Science LLC*

Mario Podestà

for the Energetic Particle Group

NSTX-U Meeting
PPPL B318
17 September, 2012



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Status report on NSTX-U 5year plan, FY14-18

Chapter 6 : Energetic Particle Research Goals & Plans

- Layout defined
 - Introduction
 - Overview of goals and plans
 - Research plans
 - Summary timeline & tables on theory and simulation tools, diagnostics
 - Only doubt is where to introduce/discuss “tools”
 - Spread throughout Sections, or
 - Add Appendixes: Theory & Simulation tools; Diagnostics [Preferred]
- Introduction completed & sent to JEM
- Chapter sections:
 - Coauthors identified; deadline for contributions: end of September
 - > Received ~50% of contributions so far
 - First draft of “Overview of goals & plans” section completed
 - > Reviewing, re-organizing material (e.g. Appendixes)
 - Filling in gaps in “Research Plans” section
- Timeline OK (assume it is so – no feedback received yet)
- Aim at having first draft available for comments/feedback by early October

Remaining tasks, analysis, simulations, ...

- Will coordinate sections on NB+HHFW with WH&CD group
 - Iterate on first drafts; avoid too much redundancy
- RF source for *AE antenna
 - 2 options identified (as of today):
 - > Low power amplifier, 1kW-CW, from Amplifier Research Corp.
 - Up to 3kW pulsed (~seconds)
 - Bandwidth 10kHz-100MHz
 - Requires function generator for input/modulation (Year#1)
 - More fancy control to be developed after initial tests
 - *This system is OK for Year#1 - and probably beyond*
 - > High power source, 100kW (!)
 - Pulsed, 5-10 ms @ 100kW
 - Tunable frequency 5-20MHz - but not in real time (C-L-C 'tank')
 - Would require extensive re-engineering to add flexibility
 - » E.g., frequency scanning capability during shot
 - Installation in NTC more costly (bulky; de-ionized water cooling; ...)
 - Over-sized for the task; increased safety issues; not the ideal choice
 - Exploring availability of other sources
 - > A set of 2-4 solid-state, moderate power (~500W) amplifiers would be best option
 - More flexible, easier to control, ...