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Introduction to the Integrated Scenarios SG!

Stefan Gerhardt (PPPL): SG Leader
Roger Raman (U. of Washington): Deputy SG Leader

NSTX-U 2015 Research Forum
B-318
2/24/2015

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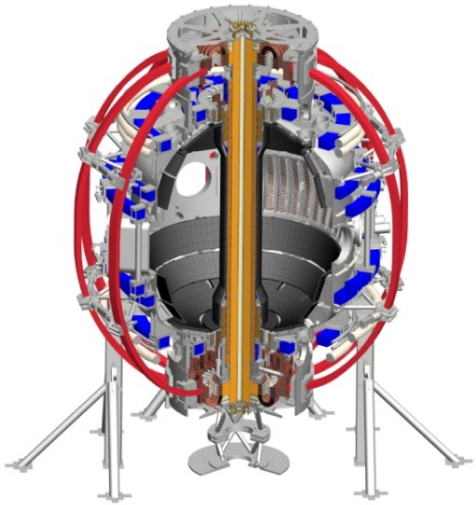

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These are the TSGs…and When They Will Meet!

- Advanced Scenarios and Control
  - TSG Leader: Devon Battaglia (PPPL)
  - Deputy TSG Leader: Stefan Gerhardt (PPPL)
  - Theory/Modeling Rep.: Francesca Poli (PPPL)
  - University Rep.: Egemen Kolemen (Princeton University)
  - MEETING: B331, 1:30 P.M. Tuesday (Director's Conference Room)
- RF Heating and Current Drive
  - TSG Leader: Rory Perkins (PPPL)
  - Deputy TSG Leader: Joel Hosea (PPPL)
  - Theory/Modeling Rep.: Nicola Bertelli (PPPL)
  - University Rep.: Paul Bonoli (MIT)
  - MEETING: B252, 9:00 A.M., Wednesday
- Solenoid Free Start-up and Ramp-up
  - TSG Leader: Dennis Mueller (PPPL)
  - Deputy TSG Leader: Roger Raman (U. of Washington)
  - University Rep.: Fatima Ebrahimi (PU)
  - MEETING: B331, 1:30 P.M. Wednesday (Director's Conference Room)

Advanced Scenarios and Control Goals

- Identify mechanisms limiting vertical stability and what additional capabilities are required for achieving vertical stability at high κ.
- Evaluate access and scalability of three scenarios:
  - High non-inductive fraction
  - High(est) current and field
  - Long(est) pulse
- Advance capabilities of tokamak/ST control and disruption avoidance.
- Achieve scenarios that optimize the verification and validation of transport and confinement modeling and predictive tools.
- Achieve steady-state density and radiation at a fixed fraction (0.5-0.8) of n_{GR}.

Advanced Scenarios and Control Breakout Session Agenda

	Speaking Time	Author	Title	Time Requested	Time Allocated
1	1:40	Snipes	Actuator Sharing and Integrated Control Demonstration	4	0
2			Characterizing Type I ELMy H-modes in He plasmas and demonstration of ELM Contr	2	0
3	1:50	Ferron	Compare benefits of off-axis NBI...	3	0
4	2:00	Gerhardt	Maximize the non inductive fraction in H-mode	2	0
5			Tuning of automated rampdown software	1	0
6			Reversed Shear Plasmas with Relaxed Profiles	1	0
7			Combining High Non-Inductive Fraction with Advanced Divertors	1	0
8	2:15	Poli	Rampdown Studies	1	0
9			NB Sustainment	1	0
10	2:25	Levinton	Measurement of NBCD	1	0
11	2:30	Boyer	Beam power and BetaN Control	0.5	0
12			Combined betaN and l_i control	1	0
13			Current profile controllability scoping study	1	0
14			Optimization of the Vertical Control Algorithm	1.5	0
15	2:45	Schuster	Model Based Optimal Feedforward Current Profile Control	1	0
16	2:50	Kolemen	X-Point Control	1	0
17			3D Coil BetaN Control	1	0
19			Adaptive ELM Control	1	0
19			Radiation Control	1	0
20			Vertical Growth Rate and max. controllable displacement	1	0
21			Controlled Snowflake Studies	1	0
22	3:10	Soukhanovskii	Snowflake Control Development	1	0
23	3:15	Canik	EPH Access and Long Pulse Development	1	0
24	3:20	Battaglia	Development of VERY Long Pulse H-Modes	2	0
25	3:25	All	***Group Discussion***		
			Totals:	**32**	**0**

MEETING: B331, 1:30 P.M. Tuesday (Director's Conference Room)

RF Heating and Current Drive Goals

- Establish reliable coupling in L- and H-mode plasmas, w/ and w/o NBI.
- Characterize HHFW absorption in NBI-heated plasmas
- Generate non-inductive low current (I_P~300 kA) H-modes with HHFW alone.
- Measure O-X-B coupling with synthetic aperture microwave imaging (SAMI).

RF Heating and Current Drive Breakout Session Agenda

	Speaking Time	Author	Title	Time Requested	Time Allocated
1	9:10	Perkins	Characterizing SOL Losses in H-Mode	1.5	0
2	9:20	Bertelli	HHFW Absorption in NB Heated Plasmas	2	0
3	9:30	Perkins	Plasma-Antenna Interactions	1	0
4	9:35	Menard	Scoping Study for Impurity Reduction...	1	0
5	9:40	Lau	SOL Reflectometer & Validating models...	1	0
6	9:45	Bertelli	HHFW CD measurements and validation	1	0
7	9:50	Bertelli	HHFW Effect on Toroidal Rotation	1	0
8	10:00	Smith	BES to measure HHFW wavefield	0.5	0
9	10:05	Golfinopoulos	Coupling to Plasma Fluctuations Using Amp...	1	0
10	10:15		**Group Discussion**		
			Totals:	**6.5**	**0**

MEETING: B252, 9:00 A.M., Wednesday

Solenoid Free Start-up and Ramp-up Goals

- Commission the CHI Hardware
- Recover CHI plasma initiation
- Inductive ramp-up of the CHI plasma
- HHFW heating and CD of low I_P plasmas
- HHFW heating of CHI formed plasmas
- NBI overdrive of low and moderate I_P plasmas
- Sustainment of NBI overdriven cases with NBI and pressure driven currents
- Supporting activities for Point Source Helicity Injection
- Impact of controlled fluctuations on edge current drive (MHD)

Solenoid Free Start-up and Ramp-up Breakout Session Agenda

	Speaking Time	Author	Title	Time Requested	Time Allocated
1	1:40	Raman	Transient CHI Plasma Startu-up	4	0
2	2:00	Nelson	Inductive flux saving of Inductively ...	2	0
3	2:15	Ebrahimi	Plasmoid instability during CHI	1	0
4	2:30	Poli	NBI Overdrive	2	0
5	2:45	Taylor	HHFW Heating of CHI Discharges	1	0
6			HHFW Ramp-up of Inductively Initiated...	1.5	0
7			Low Plasma Current, fully non-inductive HHFW H-modes	2	0
8	3:05	Reusch	Characterization of the scrape off layer density and...	1	0
9	3:20	Nelson	Impact of controlled fluctuations on edge current drive	0	0
10	3:25		**Group Discussion**		
			Totals:	**14.5**	**0**

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