### **AGENDA**

### $12^{th}$ Workshop on MHD Stability Control: Improved MHD Control Configurations

Columbia University, New York, NY Sunday, November 18 - Tuesday, November 20

<b>Sunday</b> 9:00-9:55	Registration	Coffee during registration (no morning break)
9:55-10:00	Gerald Navratil	Welcome and announcements
Session 1	Chair: R. La Haye	Resistive Wall Mode: Experiments (I)
10:00-10:40	Andrea Garofalo	Overview of recent results on RWM research on DIII-D
10:40-11:05	Jeremy Hanson	A Kalman filter for active feedback on rotating external kink instabilities in a tokamak plasma
11:05-11:45	Steve Sabbagh	Overview of recent results on RWM research on NSTX
11:45-12:10	Will Bergerson	Observation of the RWM in a line-tied screw pinch
12:10-12:35	Holger Reimerdes	Progress on understanding rotational stabilization in DIII-D
12:35-2:00		Lunch
Session 2	Chair: R. Buttery	Modeling, Error Field Physics
2:00-2:40	Yueqiang Liu	RWM modeling with full drift kinetic damping
2:40-3:05	J. Dalessio / E. Schuster	Model-based robust control of resistive wall modes
3:05-3:30	Y. Ou / E. Schuster	Optimal control of the current profile during the ramp-up phase of the discharge
3:30-3:50		Coffee Break
3:50-4:30	Alan Reiman	Passive stabilization of the vertical mode in tokamaks by parallelogram-shaped nonaxisymmetric coils
4:30-4:55	Morrell Chance	Multi-mode analysis of RWM feedback with NMA code
4:55-5:20	Jon Menard	Error field physics studies in NSTX
5:20-5:45	Mike Schaffer	Error field physics studies in DIII-D
5:45-6:00	Hiro Takahashi	Error fields generated by scrape-off-layer current (SOLC)
6:00-6:15		Discussion on Sunday topics
6:15-7:15		Social hour, drinks and light snacks provided

12/6/07

### **AGENDA**

# 12<sup>th</sup> Workshop on MHD Stability Control: Improved MHD Control Configurations Columbia University, New York, NY

Sunday, November 18 - Tuesday, November 20

Session 3 9:00-9:40 9:00-9:40 Mike Schaffer 9:40-10:20 Egbert Westerhof 10:20-10:45 Mike Makowski Observation and analysis of MHD with the DIII-D fast MSE system Coffee Break 11:05-11:45 11:05-11:45 11:45-12:10 Francesco Volpe 12:10-12:35 Rob La Haye  Chair: M. Okabayashi 2:40-3:05 Jim Drake 3:30-3:30 3:30-3:50 3:30-3:50 3:50-4:15 4:40-5:05 Erik Olofsson Sopelsa Roberto Paccagnella 4:40-5:05 Erik Olofsson Sopelsa Rob La Haye  ELM Control, Disruptions, Tearing Modes ELM control by RMPs: Physics basis, concepts for ITER, and advanced technique Preparations for ECRH feedback control of tearing modes on TEXTOR Observation and analysis of MHD with the DIII-D fast MSE system Coffee Break Disruption mitigation, modeling and expt. highlights Oblique-ECE-assisted alignment and modulation of ECCD for NTM control Requirements for Alignment of ECCD for NTM Stabilization in ITER  Lunch  Resistive Wall Mode: Experiments (II) Clean mode control: beyond the virtual shell RWM control on EXTRAP T2R using various controller configurations DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffee Break  Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Cash bar, Le Monde Restaurant Workshop Dinner, Le Monde Restaurant Workshop Dinner, Le Monde Restaurant	<b>Monday</b> 8:55-9:00		Announcements
9:40-10:20 10:20-10:45 10:20-10:45 Mike Makowski Observation and analysis of MHD with the DIII-D fast MSE system Coffee Break 11:05-11:45 11:05-11:45 11:45-12:10 Prancesco Volpe 12:10-12:35 Rob La Haye  Chair: M. Okabayashi 2:00-2:40 Paolo Zanca 2:40-3:05 Jim Drake 3:30-3:50 Gary Jackson 3:30-3:50 3:50-4:15 Yongkyoon In 4:15-4:40 Tommaso Bolzonella 4:40-5:05 Erik Olofsson Spectrum reference for RFP RWMs and modern MIMO controller synthesis 5:05-5:30 Roberto Paccagnella 4:40-5:05 Erik Olofsson Spectrum reference for RFP RWMs and modern MIMO control in RFX-mod Session A Nike Makowski Observation and analysis of MHD with the DIII-D fast MSE system Coffee Break Disruption mitigation, modeling and expt. highlights Oblique-ECE-assisted alignment and modulation of ECCD for NTM control Requirements for Alignment of ECCD for NTM Stabilization in ITER  Lunch  Resistive Wall Mode: Experiments (II) Clean mode control: beyond the virtual shell RWM control on EXTRAP T2R using various controller configurations DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffee Break Toroidal phase dependency of ELM-driven RWM Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	Session 3	Chair: J. Sarff	ELM Control, Disruptions, Tearing Modes
10:20-10:45 10:45-11:05 11:05-11:45 11:05-11:45 11:45-12:10 11:45-12:10 12:10-12:35 11:45-12:35 11:45-12:00 12:10-12:35 12:35-2:00  Chair: M. Okabayashi 12:00-2:40 12:40-3:05 13:05-3:30 13:05-3:30 13:30-3:50 3:50-4:15 13:45-4:40 13:50-4:15 14:5-4:40 15:505-5:30 15:505-5:30 15:505-5:30 10:20-12:40 12:35-2:00  Chair: M. Okabayashi 12:00-2:40	9:00-9:40	Mike Schaffer	ELM control by RMPs: Physics basis, concepts for ITER, and advanced techniques
10:45-11:05	9:40-10:20	Egbert Westerhof	Preparations for ECRH feedback control of tearing modes on TEXTOR
11:05-11:45 11:45-12:10 11:45-12:10 12:10-12:35 Rob La Haye  Chair: M. Okabayashi 2:00-2:40 2:40-3:05 3:05-3:30 3:05-3:30 3:50-4:15 4:15-4:40 Tommaso Bolzonella 4:40-5:05 Erik Olofsson 5:05-5:30 Roberto Paccagnella 4:40-5:05 Serik Olofsson Si-05-5:55 Roberto Paccagnella 5:55-6:10  Disruption mitigation, modeling and expt. highlights Oblique-ECE-assisted alignment and modulation of ECCD for NTM control Requirements for Alignment of ECCD for NTM Stabilization in ITER  Lunch  Resistive Wall Mode: Experiments (II) Clean mode control: beyond the virtual shell RWM control on EXTRAP T2R using various controller configurations DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffice Break Toroidal phase dependency of ELM-driven RWM Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	10:20-10:45	Mike Makowski	Observation and analysis of MHD with the DIII-D fast MSE system
11:45-12:10 12:10-12:35 Rob La Haye  Oblique-ECE-assisted alignment and modulation of ECCD for NTM control Requirements for Alignment of ECCD for NTM Stabilization in ITER  Lunch  Chair: M. Okabayashi 2:00-2:40 Paolo Zanca 2:40-3:05 Jim Drake 3:05-3:30 Gary Jackson 3:30-3:50 3:50-4:15 Yongkyoon In 4:15-4:40 Tommaso Bolzonella 4:40-5:05 Erik Olofsson 5:05-5:30 Roberto Paccagnella 4:40-5:05 Roberto Paccagnella 5:30-5:55 Anton Soppelsa  Oblique-ECE-assisted alignment and modulation of ECCD for NTM control Requirements of Alignment of ECCD for NTM control Requirements of ECCD for NTM control Requirements of Alignment and modulation of ECCD for NTM control Requirements of Alignment and modulation of ECCD for NTM control Requirements of Alignment and modulation of ECCD for NTM control of ECCD for NTM Stabilization in ITER  Lunch  Resistive Wall Mode: Experiments (II) Clean mode control: beyond the virtual shell RewM control of EXTRAP T2R using various controller configurations DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffee Break Toroidal phase dependency of ELM-driven RWM Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	10:45-11:05		Coffee Break
12:10-12:35 Rob La Haye Requirements for Alignment of ECCD for NTM Stabilization in ITER  12:35-2:00  Lunch  Resistive Wall Mode: Experiments (II)  Clean mode control: beyond the virtual shell  RWM control on EXTRAP T2R using various controller configurations  DIII-D Ohmic current driven RWM experiments with feedback stabilization  Coffee Break  3:50-4:15 Yongkyoon In  4:15-4:40 Tommaso Bolzonella  4:40-5:05 Erik Olofsson  Spectrum reference for RFP RWMs and modern MIMO controller synthesis  5:05-5:30 Roberto Paccagnella  5:30-5:55 Anton Soppelsa  Resistive Wall Mode: Experiments (II)  Clean mode control: beyond the virtual shell  RWM control on EXTRAP T2R using various controller configurations  DIII-D Ohmic current driven RWM experiments with feedback stabilization  Coffee Break  Toroidal phase dependency of ELM-driven RWM  Recent results on RWM research on RFX-mod  Spectrum reference for RFP RWMs and modern MIMO controller synthesis  Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch  MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	11:05-11:45	Val Izzo	Disruption mitigation, modeling and expt. highlights
Lunch		-	1
Session 4 2:00-2:40Chair: M. Okabayashi Paolo ZancaResistive Wall Mode: Experiments (II)2:40-3:05 3:05-3:30 	12:10-12:35	Rob La Haye	Requirements for Alignment of ECCD for NTM Stabilization in ITER
2:00-2:40 2:40-3:05 2:40-3:05 3:05-3:30 3:05-3:30 3:30-3:50 3:50-4:15 4:15-4:40 4:40-5:05 Erik Olofsson 5:05-5:30 Roberto Paccagnella 5:30-5:55 Anton Soppelsa  Clean mode control: beyond the virtual shell RWM control on EXTRAP T2R using various controller configurations DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffee Break Toroidal phase dependency of ELM-driven RWM Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	12:35-2:00		Lunch
2:40-3:05 3:05-3:30 3:30-3:50 3:50-4:15 4:15-4:40 4:40-5:05 5:05-5:30 Roberto Paccagnella 5:30-5:55 Anton Soppelsa  RWM control on EXTRAP T2R using various controller configurations DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffee Break Toroidal phase dependency of ELM-driven RWM Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	Session 4	Chair: M. Okabayashi	Resistive Wall Mode: Experiments (II)
3:05-3:30 3:30-3:50 3:50-4:15 Yongkyoon In 4:15-4:40 Tormaso Bolzonella 4:40-5:05 Erik Olofsson 5:05-5:30 Roberto Paccagnella 5:30-5:55 Anton Soppelsa  DIII-D Ohmic current driven RWM experiments with feedback stabilization Coffee Break Toroidal phase dependency of ELM-driven RWM Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	2:00-2:40	Paolo Zanca	Clean mode control: beyond the virtual shell
3:30-3:50 3:50-4:15 Yongkyoon In Toroidal phase dependency of ELM-driven RWM 4:15-4:40 Tommaso Bolzonella Recent results on RWM research on RFX-mod 4:40-5:05 Erik Olofsson Spectrum reference for RFP RWMs and modern MIMO controller synthesis 5:05-5:30 Roberto Paccagnella Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch 5:30-5:55 Anton Soppelsa MIMO Modeling and Design for MHD Modes Control in RFX-mod  5:55-6:10 Discussion on Monday topics  7:00 Cash bar, Le Monde Restaurant	2:40-3:05	Jim Drake	RWM control on EXTRAP T2R using various controller configurations
3:50-4:15 Yongkyoon In 4:15-4:40 Tommaso Bolzonella 4:40-5:05 Erik Olofsson Spectrum reference for RFP RWMs and modern MIMO controller synthesis 5:05-5:30 Roberto Paccagnella 5:30-5:55 Anton Soppelsa MIMO Modeling and Design for MHD Modes Control in RFX-mod 5:55-6:10 Discussion on Monday topics  Cash bar, Le Monde Restaurant	3:05-3:30	Gary Jackson	DIII-D Ohmic current driven RWM experiments with feedback stabilization
4:15-4:40 4:40-5:05 Erik Olofsson 5:05-5:30 Roberto Paccagnella 5:30-5:55 Anton Soppelsa  Recent results on RWM research on RFX-mod Spectrum reference for RFP RWMs and modern MIMO controller synthesis Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  Discussion on Monday topics  Cash bar, Le Monde Restaurant	3:30-3:50		Coffee Break
4:40-5:05 Erik Olofsson Spectrum reference for RFP RWMs and modern MIMO controller synthesis 5:05-5:30 Roberto Paccagnella Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  5:55-6:10 Discussion on Monday topics  7:00 Cash bar, Le Monde Restaurant	3:50-4:15	Yongkyoon In	± • •
5:05-5:30 Studies on externally applied m=0 modes in the RFX-mod Reversed Field Pinch MIMO Modeling and Design for MHD Modes Control in RFX-mod  5:55-6:10 Discussion on Monday topics  Cash bar, Le Monde Restaurant	4:15-4:40	Tommaso Bolzonella	Recent results on RWM research on RFX-mod
5:30-5:55 Anton Soppelsa MIMO Modeling and Design for MHD Modes Control in RFX-mod 5:55-6:10 Discussion on Monday topics 7:00 Cash bar, Le Monde Restaurant			•
5:55-6:10 Discussion on Monday topics 7:00 Cash bar, Le Monde Restaurant	5:05-5:30	Roberto Paccagnella	· · · · · · · · · · · · · · · · · · ·
7:00 Cash bar, Le Monde Restaurant	5:30-5:55	Anton Soppelsa	MIMO Modeling and Design for MHD Modes Control in RFX-mod
,	5:55-6:10		Discussion on Monday topics
7:30 Workshop Dinner, Le Monde Restaurant	7:00		Cash bar, Le Monde Restaurant
	7:30		Workshop Dinner, Le Monde Restaurant

12/6/07 2/3

### **AGENDA**

# 12<sup>th</sup> Workshop on MHD Stability Control: Improved MHD Control Configurations Columbia University, New York, NY

Sunday, November 18 - Tuesday, November 20

### Tuesday

8:55-9:00 Announcements

Session 5 9:00-9:40	Chair: G. Navratil	Tearing Modes, MHD Control in Future Devices  High bets and high temperature plagmas in the MST REP.
	Brett Chapman	High beta and high temperature plasmas in the MST RFP Flow Shear Effects on Resistive MHD Instabilities in Tokamaks
9:40-10:20	Dylan Brennan	
10:20-10:45	Amiya Sen	Control of Internal MHD Modes in Tokamaks: Novel Hardware and Software
10:45-11:05		Coffee Break
11:05-11:30	Jim Bialek	ITER resistive wall mode feedback with rotation: Recent VALEN modeling
11:30-11:55	Oksana Katsuro-Hopkins	Modeling of active control in KSTAR
11:55-12:20	Rip Perkins	Window pane vs. push-pull actuator coils in ITER
12:20-12:45	Richard Buttery	Tests of n=1 and n=2 for ELM control
12:45-1:00	Ted Strait	Summary of the ITPA meeting at Garching
1:00 -1:15	Gerry Navratil	Final discussion and perspectives on future research
1:15	Rob La Haye	Next MHD Control Workshop: Theme and location
	-	-
1:30		End
-		

12/6/07 3/3