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27th Workshop on MHD Stability Control, a joint US-Japan workshop
Ensuring device reliability through MHD control

Zoom link: distributed directly to participants

Workshop Organizing Chair: Jeffrey Levesque. Local organizer: Eric Howell

Invited Presentations (I): 30 minutes (suggested as ~22 minute talk + ~8 minutes for discussion & questions)

Contributed Presentations: 18 minutes (suggested as ~14 minute talk + ~4 minutes for discussion & questions)

Day 1: Thursday October 26

Start Time	Duration	Session/Talk Title	Presenter or Chair (I) = Invited, (R) = Remote	Affiliation
8:15	0:30	Check-in		
8:45	0:15	Welcome & Announcements	Jeffrey Levesque Eric Howell	Columbia Univ., Tech-X, Workshop Organizers
		Session 1: Non-linearity and saturation	**Chair: Masaru Furukawa**	
9:00	0:30	Fluctuation-induced dynamo EMF in current-driven tokamak sawtooth relaxation	Karsten McCollam (I)	University of Wisconsin - Madison
9:30	0:18	Extended operational regimes and characteristics of low-aspect-ratio tokamak and RFP plasmas in RELAX	Takeru Inoue	Kyoto Institute of Technology
9:48	0:18	A Compressible Isothermal Island Equilibrium and Transport model	María Stefany Cancino Escobar	National Autonomous University of Mexico, University of Texas at Austin
10:06	0:24	Coffee break		
		Session 2: Passive stability / Scenarios	**Chair: Nikolas Logan**	
10:30	0:30	Developing an ideal MHD stability solver and optimizer using the DESC framework for stellarators and tokamaks	Rahul Gaur (I)	Princeton University
11:00	0:18	Towards Prediction of Tearing-Free Scenarios with Physics Informed Machine Learning	Stuart Benjamin	MIT Plasma Science and Fusion Center
11:18	0:18	Negative Triangularity Scenario Development and MHD	William Boyes	Columbia University
11:36	0:18	Edge ion orbit losses and fusion performance	Linda Sugiyama	Massachusetts Institute of Technology
11:54	1:56	Lunch		
		Session 3: Prediction of disruptions and locked modes	**Chair: Brett Chapman**	
13:50	0:18	Expansion of High Accuracy, Multi-device Disruption Event Characterization and Forecasting (DECAF) Research	Steven A. Sabbagh	Columbia University
14:08	0:18	Improving Real-Time-Capable Vertical Displacement Event Forecasting and Identification in Tokamak Plasmas With DECAF	Matt Tobin	Columbia University
14:26	0:18	DECAF multi-device model for halo currents generated during tokamak disruption interval - first steps	Veronika Zamkovska	Columbia University
14:44	0:18	MHD Mode Locking Forecaster Across Tokamak Devices and Real-time Implementation with DECAF	Juan Riquezes	Columbia University
15:02	0:18	Probabilistic locked mode predictor in the presence of a resistive wall and finite island saturation	Cihan Akcay (R)	General Atomics
15:20	0:20	Coffee break		
		Session 4: Innovative control	**Chair: Anna Vu**	
15:40	0:18	Experimental Plans for MHD Stabilization in WHAM	Tony Qian	Princeton University
15:58	0:18	FPGA-based microsecond-latency MHD mode tracking using high-speed cameras and deep learning on HBT-EP	Yumou Wei	Columbia University
16:16	0:18	Tearing Mode Control through Physics and Machine-Learning Based Methods	Andy Rothstein	Princeton University
16:34	0:30	Advancements of JT-60SA MHD Control in QST	Shizuo Inoue (I) (R)	National Inst. for Quantum Science and Technology
17:04		Discussion / Close		

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Day 2: Friday October 27				
Start Time	**Duration**	**Session/Talk Title**	**Presenter or Chair (I) = Invited, (R) = Remote**	**Affiliation**
		Session 5: Stability analysis	**Chair: Eric Howell**	
8:30	0:30	MHD equilibrium and stability analysis via simulated annealing	Masaru Furukawa (I)	Tottori University
9:00	0:18	Extended MHD solutions with plasma-vacuum interface	Makoto Hirota	Tohoku University
9:18	0:18	Drift kinetic modelling of neoclassical tearing modes: rotating islands and associated polarisation effects at threshold scales	Alexandra Dudkovskaia (R)	York Plasma Institute, University of York
9:36	0:18	Examine MHD Stability Conditions in Plasma Configurations Developed by Various Heating and Current Drive Schemes	Ehab Hassan	Oak Ridge National Laboratory
9:54	0:26	Coffee break		
		Session 6: Multi-mode	**Chair: Yoshihide Shibata**	
10:20	0:30	Measurements of n=1 MHD stability in high beta discharges using multi-modal active MHD spectroscopy	SeongMoo Yang (I)	Princeton Plasma Physics Laboratory
10:50	0:18	Identifying Multi-mode Interactions of Magnetic Fluctuations with Faraday-effect Polarimetry in DIII-D	Rachel Myers	University of Wisconsin - Madison
11:08	0:18	Characterizing faster than predicted tearing mode growth with independent diagnostics on HBT-EP	Rian Chandra	Columbia University
11:26	0:18	Variable-spectrum mode control of high poloidal beta discharges	Jeremy Hanson (R)	Columbia University
11:44	0:10	Group photo		
11:54	1:56	Lunch		
		Session 7: Measurements of modes and equilibria	**Chair: Linda Sugiyama**	
13:50	0:30	Development of island width measurement capability using an analytical interpretation of ECE signals at DIII-D	James Yang (I)	Princeton Plasma Physics Laboratory
14:20	0:18	Enabling high fidelity analysis at extreme scale: Superfacility and automated kinetic reconstructions	Torrin Bechtel	General Atomics
14:38	0:18	Initial results of Magnetic Field Decomposition of SPARC simulations using Gauss' Separation Algorithm	Gregorio L. Trevisan (R)	MIT Plasma Science and Fusion Center
14:56	0:18	Vessel current effect analysis in magnetic signals and initial application on MHD activity analysis in DIII-D	Yanzheng Jiang	General Atomics
15:14	0:18	Studies of internal magnetic activity in DIII-D using Faraday-effect polarimetric measurements	Tom Benedett	University of California - Los Angeles
15:32	0:18	Coffee break		
		Session 8: Tearing mode control / prevention	**Chair: James Yang**	
15:50	0:30	Plan for tearing mode control during the ITER non-active phases	Anna Vu (I)	ITER
16:20	0:18	Direct preemptive stabilization of m,n = 2,1 neoclassical tearing modes by electron cyclotron current drive in the DIII-D low-torque ITER baseline scenario	Laszlo Bardoczi	General Atomics & University of California, Irvine
16:38	0:18	Use of Differential Plasma Rotation to Prevent 2/1 Tearing Modes Driven by 3-Wave Coupling	Nathan Richner	Oak Ridge Associated Universities
16:56	0:18	Controlling islands via RF heating and current drive.	Allan Reiman (R)	Princeton Plasma Physics Laboratory
17:14		Discussion / Close		

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Day 3: Saturday October 28				
Start Time	**Duration**	**Session/Talk Title**	**Presenter or Chair (I) = Invited, (R) = Remote**	**Affiliation**
		Session 9: Error fields, RMPs, and sawteeth	**Chair: Ryan Sweeney**	
8:30	0:30	Effects and correction of in-board originating n=1 error fields on tokamak COMPASS	Tomáš Markovic (I)	IPP of the Czech Academy of Sciences
9:00	0:18	RMP experiments in small tokamak device HYBTOK-II	Yoshihide Shibata	National Institute of Technology, Gifu college
9:18	0:18	Instability with magnetic island leading to collapse and its response to external RMP in helical plasmas	Yuki Takemura (R)	National Institute for Fusion Science
9:36	0:18	Sawtooth Suppression by Flux Pumping in HBT-EP	Boting Li	Columbia University
9:54	0:30	Flux pumping experiments in ASDEX Upgrade and JET	Alexander Bock (I)	Max Planck IPP
10:24	0:26	Coffee break		
		Session 10: VDEs and disruptions	**Chair: Jeff Levesque**	
10:50	0:18	Vertical instability growth rate studies with rigid and deformable plasma models and proximity controller development in the TCV tokamak	Stefano Marchioni	EPFL - Swiss Plasma Center
11:08	0:18	Density limit prediction at DIII-D: an offline analysis	Andrew Maris	Massachusetts Institute of Technology
11:26	0:18	Wall touching kink mode (WTKM) in tokamak disruptions	Leonid E Zakharov	LiWFusion
11:44	0:18	Development of an integrated simulation code for non-axisymmetric disruption based on the Grad-Hogan model	Yushiro Yamashita	Kyoto University
12:02	0:05	Announcement of US-Japan MHD workshop and ITPA MHD topical group meeting in spring 2024	Masaru Furukawa	Tottori University, Japan MHD Workshop chair
12:07		Discussion / Close	Jeffrey Levesque	Columbia University, Workshop Program Chair