Plasma Edge Theory Workshop / PET 2021

September 13-15, 2021

- 'First' session: 14:00 Lausanne, 21:00 Japan, 20:00 China, 8:00 Boston, 5:00 San Diego
- 'Second' session: 23:00 Lausanne, D+1 6:00 Japan, D+1 5:00 China, 17:00 Boston, 14:00 San Diego
- 'Third' session: D+1 5:00 Lausanne. D+1 12:00 Japan, D+1 11:00 China, 23:00 Boston, 20:00 San Diego

We use Lausanne time below (CET)

Day 1 – 13 September 2021

First session (Chair: P. Ricci)

14:00: Welcome and Presentation from host Institution (A. Fasoli)
14:20: H. Reimerdes: TCV experiments testing plasma edge models for conventional and alternative plasma exhaust solutions
14:55: R. Ding: Physics Basis and Design of Tungsten Divertor for Chinese Fusion Engineering Testing Reactor

Second session (Chair: S. I. Krasheninnikov)

23:00: H. Bufferand: Investigation of transport barrier formation in edge turbulent simulations
23:20: M. Giacomin: Turbulent transport regimes in the tokamak boundary: analytical scaling laws of the near scrape-off layer width and the crossing of the density limit, including comparison with experimental results
23:40: R. Coosemans: A self-consistent mean-field model for turbulent particle and heat transport in 2D interchange-dominated ExB turbulence in the scrape-off layer
0:00: W. Dekeyser: A self-consistent mean-field model for anomalous transport due to electrostatic ExB drift turbulence in the scrape-off layer and implementation in SOLPS-ITER
0:20: S. Carli: Bayesian MAP-estimation of k-enstrophy turbulence model parameters using Algorithmic Differentiation in SOLPS-ITER

Third session (Chair: Y. Martin)

5:00: R. Singh: On How Edge Shear Layer Collapse Defines Greenwald limit
5:20: X. Xu: Impact of pedestal operation modes and machine design on the divertor heat flux width scaling
5:40: M. Zhao: Effects of Ion Temperature Anisotropy with Cross-Field Drifts on 2D Scrape-Off Layer Transport
6:00: G. Xu: Interpretive modelling of divertor tungsten erosion during EAST L- and H-mode discharges
6:20: D. Zhang: Simulation of EAST edge plasma using SOLPS-ITER/BOUT++ coupling

Day 2 – 14 September 2021

First session (Chair: Y. Marandet)

14:00: I. Senichenkov: Detached regime with highly radiating X-point: physics and modeling
14:35-16:00 Poster session 1

Second session (Chair: I. Joseph)

23:00: M. Dorf: Continuum Gyrokinetic Simulations of Edge Plasmas in Single-Null Geometries
23:35: D. Michels: Electromagnetic, gyrokinetic turbulence simulations in diverted geometry
23:55: B. Frei: A gyrokinetic moment-based method to simulate the turbulent plasma dynamics in the boundary of fusion devices
0:15: N. Mandell: Magnetic fluctuations in gyrokinetic simulations of tokamak scrape-off layer turbulence

Third session (Chair: R. Ding)

5:00: H. Xie: TECXY simulations of power exhaust properties for different divertor magnetic topology configurations of CFETR

5:20: O. Pan: SOLPS-ITER modeling on the operational window of the X-point radiator and comparison with recent experiments in ASDEX Upgrade

5:40: M. Scotto d'Abusco: 2D transport simulations of a full WEST discharge including magnetic equilibrium evolution with the new SOLEDGE-HDG code

6:00: R. Osawa: Study of STEP inner divertor in disconnected-double-null configuration

6.20: A. Holm: Impact of vibrationally resolved hydrogen molecules on the particle balance in one-dimensional EIRENE simulations

Day 3 – 15 September 2021

First session (Chair: R. Zagórski)

14:00: S. Saito: Development of Molecular Dynamics Simulation Code for Hydrogen Recycling on Plasma Facing Materials for Neutral Transport Analysis in Fusion Device

14:35-16:00 Poster session 2

Second session (Chair: Y. L. Igitkhanov)

23:00: M. Usoltceva: Modelling of ELMs in the far Scrape-Off Layer density profile and comparison to experimental data of Microwave Interferometer in the Limiter Shadow

23:20: D. Mancini: Investigation of the density shoulder formation by using self-consistent simulations of plasma turbulence and neutral kinetic dynamics

23:40: T. Body: Validation and prediction with GRILLIX

0:00: D. Galassi: Validation of GBS full-size simulations in TCV diverted geometry

0:20: M.J. Pueschel: How RMPs Affect L- and H-Mode Edge Turbulence via Zonal-Flow Regulation

Third session (Chair: M. Yagi)

5:00: R. Smirnov: On the role of plasma-wall coupling in edge plasma physics

5:35: S. Rode: Implementation and Validation of Guiding Centre Approximation into ERO2.0

5:55: M. Raghunathan: Generalized Zhdanov Collisional Closure for Multi-Component, Multi-Temperature Plasma using the Boltzmann Collsion Operator for Scrape-Off Layer/Edge Applications

6:15: N. Horsten: Combination of micro-macro and spatially hybrid fluid-kinetic approach for hydrogenic plasma edge neutrals

6:35 Concluding remarks

POSTER SESSION 1
1. Albert Devasagayam: Effect of recycling profile on SOL physics in the FT-2 Tokamak
2. Chekole: Effect of rotation and self-gravity on the propagation of MHD waves
3. Dai *presented by* Chen: Numerical estimations of surface temperature evolution during edge localized modes on EAST
4. Francisquez: One-dimensional gyrokinetic and gyrofluid study of a mirror plasma
5. Geraldini: Electron gyroradius effect on magnetised sheath potential drops
6. Hannachi/Stamm: Spectroscopic Diagnostic of Oscillating Electric Fields in Edge Plasmas
7. Hoshino: Investigation of neutral-neutral collision model in the DEMO level divertor by SONIC simulation
8. Igitkhanov: Figures of Merit of Particle Exhaust Efficiency in Fusion Reactor
9. Iorio: Effect of wide orbits and collisionality at pedestal-like conditions on confinement transition
10. Islam: Impact of Neutral Gas Puffing on the Divertor Power Exhaust and Particle Control in GAMMA 10/PDX by the LINDA-KNMC Code
11. Joseph: Edge localized mode propagation through the tokamak scrape-off layer
12. Kawamura: Formation of Divertor Configuration for a Quasi-Symmetry Stellarator with External Coils and its Consequences for Transport
13. Maes: On the mitigation of cancellation errors in hybrid particle-continuum methods for solving kinetic equations

14. Makarov: SOLPS-ITER modeling using improved multi-ion collisional closure for the parallel kinetic coefficients calculation
15. Marandet: Impurity transport within the Zhdanov closure in Soledge3X-EIRENE multi-fluid/multi-temperature code: application to WEST plasmas
16. Masline: Scoping studies of plasma detachment in long-leg divertor geometries
17. Mortier *presented by* Samaey: Source term estimation of the neutral kinetic process when approximated via random walk
18. Nakano: Improvement of Neutral Transport Model in SONIC toward DEMO
POSTER SESSION 2
1. Nishimura: N-body numerical simulation of charged particle transport in the presence of background magnetic field
2. Piraccini: Spatial adaptivity in SOLEDGE3X-HDG for edge plasma simulations in versatile magnetic and reactor geometries
3. Reynolds: Simulation Efforts and Opportunities at General Fusion
4. Rivals: SOLEDGE3X full vessel plasma simulations for computation of ITER first-wall fluxes
5. Rosato/Stamm: Addressing the accuracy of spectroscopic models used in tokamak edge plasma diagnostics
6. Rozhansky: Edge tokamak transport in regimes with high collisionality
7. Sang *presented by* Wang: *Simulation of Plasma Transport in Linear Plasma Device by using BOUT++*
8. Sang *presented by* Zhou : Comparison of DIVIMP and SOLPS-ITER modeling of tungsten transport in EAST edge plasma
9. Shoji: Full-torus Simulation of Tungsten Erosion by Intrinsic Carbon Ions in the Large Helical Device Peripheral Plasma Using the ERO2.0 code
10. Simpson: Integrated JETTO-EPED-MISHKA-EIRENE predictions of the dependence of $p_{e,ped}$ on $n_{e,sep}$ of JET H-mode plasmas
11. Steigmer: Roadmap to edge turbulence simulations at reactor scale
12. Telesca: Core-SOL simulations of high power JET-ILW pulses fuelled with gas and/or with pellets
13. Ulbl: Implementation and Verification of a Conservative, Multi-Species, Gyro-Averaged, Full-f, Lenard-Bernstein/Dougherty Collision Operator in the Gyrokinetic Code GENE-X
14. Umansky/Krasheninnikov: Modeling of edge plasma dynamics with active wall boundary conditions
15. Van Uytven: Advanced spatially hybrid fluid-kinetic modeling of plasma-edge neutrals and application to ITER cases using SOLPS-ITER
16. Vekshina: SOLPS-ITER EU-DEMO modeling with drifts and kinetic neutrals
17. Yagi/Seto: Turbulence burst in resistive ballooning mode driven ELM crash
18. Ye *presented by* Guo: Influence of the drifts on double-peaked emission profile of the visible light in the upper divertor region of EAST