Summary of WG M1 (Modelling)
Monday 30 March 2020

Working group agenda:
14:00 - 14:25 – T. Bolzonella: Overview of modelling activities and 2020 plans
14:25 - 14:50 – L. Garzotti: Modelling of scenarios of Initial Research Phase I and II
14:50 - 15:15 – M. Wischmeier: Edge and divertor modelling: status and perspectives
15:15 - 15:40 – P. Lauber: Energetic particle dynamics induced by off-axis NBI

Summary:

In the first presentation, T. Bolzonella gave an overview of 2020 WPSA modelling activities in terms of organization (tasks, deliverables), working groups and approved resources. Given the wide target and the finite amount of resource, the need for clearly oriented tasks was highlighted. The final slides on the use of IMAS in WPSA received particular attention and stimulated discussions. Further contacts between WPSA modelling, WPCD and IO are recommended in particular to assess the possibility to implement a full JT-60SA machine description and an interface to experimental data for future interpretative simulations.

In the second presentation, L. Garzotti provided a summary of JINTRAC simulations of scenarios of Initial Research Phase I and II. With respect to past activities, modelling capabilities incorporate now a scheme that can adjust the pedestal pressure according to ideal MHD stability criteria (starting from a guessed density at the top of the pedestal, temperature is then automatically determined) and include the effect of impurities (SANCO). First target, to be expanded in future, is scenario 2 (low density ELMy H-mode) at half field and half current.

In the third presentation, M. Wischmeier outlined status and perspectives of edge and divertor modelling under WPSA. Activities on “integrated” modelling using COREDIV and EDGE2D-EIRENE are stopped for 2020: a comparison between the two approaches has been made for scenario 3 (C wall); intermediate results with Coconut are stored (on hold due to lack of time and manpower). SOLEDGE2D-EIRENE model was developed for scenario 2 (C wall); cases with only C impurities as well as with Ar or Ne puffing have been explored. Reliable solutions for low-density C scenarios seem to be still missing; comparison with SONIC results is recommended for 2020. Divertor conditions in Scenario 3 with metallic wall (W) and N injection are being assessed by means of SOLPS-ITER leading e.g. to the identification of driving mechanism(s) for detachment. A new activity on the use of SOLEDGE3X is starting in 2020.

In the fourth contribution, P. Lauber presented recent developments on Energetic Particle dynamics induced by off-axis neutral beam injection. The exclusive off-axis JT-60SA N-NBI capabilities were highlighted in the framework of a general approach towards the ITER case. A comparison of LIGKA with MEGA results started in collaboration with A. Bierwage (QST); the full implementation of IMAS workflows on JT-60SA data is proposed. This will allow the comparison of EP distribution function with ASCOT and of stability results with ASPACK towards the final target of understanding and predicting several aspects of linear and non-linear EP physics.