SOFT 2018



Contribution ID: 370

Type: not specified

P4.034 Modeling of ITER initiation scenarios using IMAS framework

Thursday, 20 September 2018 11:00 (2 hours)

A careful control of poloidal field (PF) coil currents is indispensable to assure a successful plasma initiation in ITER. This requires the development of an accurate modeling tool which can evaluate PF coil current and voltage waveforms leading to a satisfactory breakdown condition. In particular, it is of most importance to provide the necessary loop voltage with a sufficiently large field null in the presence of a large amount of eddy current anticipated in ITER plasma initiation. In this study, we develop an ITER plasma initiation scenario by using a two-dimensional ITER conductor model. The realistic power supply constraints such as the maximum voltage and current are taken into account. The constraints for flux and fields are imposed by using a constrained least square method. We evaluate various scenarios and provide an optimal initiation scenario, satisfying all the constraints imposed to obtain a successful breakdown. In addition to this, we identify the most vulnerable point in terms of inductive heating for each PF coil. This information will be of importance for a thermos-hydraulic analysis of ITER PF coils. The simulation code is developed using the ITER Integrated Modeling Analysis Suite (IMAS) data structure for an easy adaptation to the integrated ITER simulator.

Presenter: JUNG, Laurent (National Fusion Research Institute)

Session Classification: P4