Modelling of JT60SA Operational Scenarios

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Reference scenarios for the JT-60SA tokamak have been simulated with one-dimensional transport codes to assess steady state conditions and provide a profile database for further physics studies (e.g. MHD stability, gyrokinetic analysis). The types of scenario considered vary from pulsed standard H-mode to advanced non-inductive steady-state plasmas. In this paper we present the results obtained with the ASTRA, JETTO and CRONOS codes equipped with the Bohm/gyro-Bohm, CDBM and GLF23 transport models. The scenario analysed here are a standard H-mode, a hybrid scenario and a non-inductive steady state plasma with operational parameters from the JT60SA research plan [1].

Fully predictive transport simulations of the scenarios under consideration with the above transport models and codes have been performed. The results from the different codes are in agreement and the main plasma parameters generally agree well with the zero dimensional estimates reported previously [1]. In some cases, rather optimistic assumptions have had to be made on the confinement in the edge transport barrier to achieve the nominal parameters of the zero-dimensional analysis indicating the importance of this region on global plasma performance. The sensitivity of the results to different transport models, to the ELM/pedestal model and separatrix density has been investigated.

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[1] JT60SA – RP v3.1, http://www.jt60sa.org/pdfs/JT-60SA_Res_Plan.pdf