## H-Mode Plasmas Transport Simulation in ITER with Effect of Neoclassical Tearing Mode

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For the prediction of ITER plasmas, the transport analysis has been carried out using the toroidal transport linkage code TOTAL [1] focusing on H-mode formation and the effect of neoclassical tearing mode (NTM). This is a 2- or 3-dimensional equilibrium and 1-dimensional predictive transport code for both tokamak and helical systems. In the tokamak code TOTAL-T, the external current drive, bootstrap current, sawtooth oscillation, ballooning mode and NTM mode effect are included. The steady-state burning plasma operation is achieved by the feedback control of density fuelling and external heating power control. The impurity dynamics of iron and tungsten is also included in this code.

Here, several H-mode transport models are adopted, and the neoclassical tearing mode (NTM) effects are especially evaluated using the modified Rutherford Model with the stabilization of the ECCD current drive. The excitation of m=2/n=1 NTM leads to the 20 % reduction in the central temperature in ITER and the effect of 3/2 mode (5-10 % temperature reduction) is also evaluated.

The interaction of the H-mode formation, NTM excitation and confinement degradation in ITER will be discussed in the Conference.

## Reference:

[1] K. Yamazaki, Y. Higashiyama, T. Sawafuji, Y. Sakawa, H. Arimoto, T. Shoji, J. Garcia, J. Dies, Yu. Igitkhanov, T. J. Dolan, "Burning Plasma Simulation and System Assessment of Tokamak and Helical Reactors", Fusion Engineering & Design 81 (2006) 2743-2748