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Modeling of Anomalous Plasma Current Evolution in Tokamak Hybrid Operation Scenarios HYUNSEOK KIM, WONJAE LEE, YONG-SU NA, Seoul National University, FUSION AND PLASMA APPLICATION LABORATORY TEAM — Tokamak experiments worldwide have discovered hybrid scenarios, which exhibit high confinement and stability simultaneously, where the q-profile is relatively flat at the centre with qmin q0 1 in stationary conditions. However, the reasons for high fusion performance and for sustainment of flat q-profiles in hybrid scenarios are not clarified yet. In this work, a numerical modeling is carried out using ASTRA to simulate an anomalous current evolution, observed in some experiments and to figure out factors which affect the flat and stationary q- profile in hybrid scenarios. Firstly, the neoclassical resistivity is used for the simulation and compared with experiments. Then, the additional terms based on the ohm's law, like an anomalous parallel plasma resistivity, a hyper resistive term and etc., are introduced and their effects are investigated by comparing with experiments. Here, the parallel ohm's law for mean magnetic fields is adopted for current diffusion. The modeling results are expected to contribute to understand physical background of improvement of confinement and stability in hybrid operation scenarios.

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