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Simulations of plasma responses due to RMP and external antenna with BOUT++ code BIN GUI, ASIPP, LLNL, XUEQIAO XU, LLNL, TIANYANG XIA, ASIPP, LLNL — A minimum set of three-field two-fluid equations based on the peeling-ballooning (P-B) model with nonideal physics effects was used to simulate pedestal collapse by Xu, et al using the BOUT++ code (Xu, et al., Nucl. Fusion, 2011). We extended the model to include the resonant magnetic perturbation (RMP), to study the influence of RMP field on the pedestal plasmas turbulence, transport and ELMs. The RMP field is added at the radial boundary and is self-consistently calculated in the plasma using the two-fluid model. Based on this work, we will also upgrade the capability to include high $k_\perp$ antenna system to drive drift-Alfvenic modes at the outer mid-plane, to simulate the plasma fluctuations responses in L-mode, H-mode and ELM discharges. This capability can also be used to simulate the SOL plasma-wave interaction and impurity transport under a large localized RF sheath potential generated during the plasma heating by ICRF wave.

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