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Kinetic XGC0 study of the 3D resonance magnetic perturbation effect on edge pedestal dynamics and the ELM onset boundary GUNYOUNG PARK, S. KU, C.-S. CHANG, H. STRAUSS, New York University, I. JOSEPH, R. MOYER, University of California at San Diego, P. SNYDER, General Atomics, CPES TEAM — Effect of the resonance magnetic field perturbation (RMP) on the edge pedestal dynamics is studied using an edge particle code XGC0. Its impact on the stability boundary of the edge localized modes (type-I ELM) is examined by coupling XGC0 to the linear ideal MHD code Elite. Reduction of the pedestal density by RMP is explained for the first time, with increased ion temperature. The electron temperature can rise if sufficient heat can flow out from the core into the edge. In addition to the pressure profile changes in an unconventional way, the bootstrap current profile can also change in an unconventional way in the presence of RMP. Thus, RMP can modify the MHD stability property of the edge localized mode. XGC0 is a full-f, edge guiding center particle code which has a realistic magnetic field geometry with a radial electric field solver. XGC0 can include 3D magnetic perturbation, magnetic separatrix, material wall with neutral recycling, Monte Carlo neutral particles with atomics, and ions and electron particles with conserving collisions.

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