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Plasma Response to Resonant Magnetic Perturbation in a Tokamak[1] PING ZHU, University of Science and Technology of China, University of Wisconsin-Madison, XING-TING YAN, WEN-LONG HUANG, University of Science and Technology of China — Resonant magnetic perturbation (RMP) has been increasingly adopted as a practical tool to suppress or mitigate the edge localized modes in tokamak experiments. To understand the effects of RMPs on the properties of tokamak edge plasma, we calculate and study the plasma response to RMP in a circular-shaped limiter tokamak equilibrium, using both a reduced MHD model in theory and a full MHD model with anisotropic heat transport implemented in the NIMROD code. A low-n RMP with single helicity is imposed as the boundary condition at the tokamak wall location, where n is the toroidal mode number. Plasma responses to RMPs are obtained through solving and analyzing the steady states of the linear and nonlinear evolution of the system subject to the RMP boundary condition. The effects of toroidal rotation, plasma β, and nonlinearity on the amplitude and structure of the plasma response are examined and discussed.

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Ping Zhu
University of Science and Technology of China

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