

Abstract Submitted
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Criteria for Neoclassical Tearing Modes Suppression in KSTAR

Y.S. PARK, Y.S. HWANG, Seoul National University — In KSTAR, neoclassical tearing modes(NTMs) will be suppressed by using 170GHz electron cyclotron current drive(ECCD) system with steering mirrors that align the current deposition to NTM locations. As an initial stage of NTM suppression study, 1 MW ECCD power will be used to suppress $m/n = 3/2$ and $2/1$ NTMs. To confirm the feasibility of successful suppression of the modes under the proposed KSTAR environment, modified Rutherford equation(MRE) which encapsulates stability of NTMs is constructed for the target equilibrium of KSTAR. The geometric coefficients in MRE are obtained by comparing saturated sizes of NTMs from ISLAND code [1] with the amounts of local bootstrap currents from ONETWO. Parameters related to the operation of ECCD are analyzed by TORAY-GA linear ray-tracing code. Due to the small ECCD power available at the initial stage of KSTAR, condition of the optimum ECCD modulation is considered in the analysis to maximize suppression performance. From the analyses, criteria such as the minimum ECCD power required for complete suppression of the modes and the optimum conditions of EC wave launch angle and modulation duty factor are derived for the successful NTM suppression in KSTAR. [1] C.N. Nguyen, G. Bateman and A.H. Kritz, Phys. Plasmas 11 3460 (2004)

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