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TH/P3-22: Magnetic Island Dynamics under External Magnetic Perturbation in Rotating Resistive Tokamak Plasma

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The modeling of the magnetic island evolution under RMP in rotating plasma from seed island initial generation, through appearance and development of the NTM till its locking and saturation is presented. The effects of plasma resistivity, viscosity, diamagnetic drift and the effect of the currents induced in the resistive vacuum vessel are taken into account. The calculations are carried out with the TEAR-code based on the non-linear modified Rutherford model. The dependence of the tearing mode stability index on the angular position of the mode with respect to the RMP is taken into account. It results in deviations of the magnetic island rotation velocity from the velocity of the plasma layer in the vicinity of the rational magnetic surface. The magnetic island dynamics under RMP is analyzed for different plasma parameters and mode numbers. The NTM behavior and capabilities of the NTM avoidance or suppression in ITER are discussed for cases of the seed island generation by different RMP sources including the coils for ELM mitigation.

Country or International Organization of Primary Author

Russian Federation

Collaboration (if applicable, e.g., International Tokamak Physics Activities)

International Tokamak Physics Activities

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