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# Rotation Reversal in KSTAR and Its Turbulence and Transport Characteristics

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For several years, dedicated experiments have been performed in the KSTAR Ohmic L-mode plasmas to investigate the rotation reversal phenomena and it was finally observed in 2015. We found that the rotation reversal can be related to the rotation gradient change with respect to the electron density or the collisionality in the region rho ~ 0.3-0.6. In KSTAR, its possible mechanism was investigated by perturbative experiments using the beam blip technique with two measurement systems, x-ray imaging crystal spectrometers (XICS) and charge exchange recombination spectroscopy (CES). The result of the momentum transport analysis implies that the rotation reversal with respect to the electron density or the collisionality mainly results from the change of the momentum transport rather than that of the intrinsic torque. For a better understanding of the underlying physics, linear and non-linear gyrokinetic simulations are performed with GKW to analyse the turbulence and transport characteristics in the experiment. The results are compared with fluctuation characteristics measured by multi-channel microwave imaging reflectometry (MIR) and electron cyclotron emission imaging (ECEI).

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