

Intrinsic Toroidal Rotation for Ohmic L-mode Plasmas in KSTAR

Friday 26 October 2018 08:30 (4 hours)

The toroidal rotation from pure ohmic discharges without any external momentum sources is one of the most fundamental types of self-generated intrinsic rotation for magnetic fusion researches. There have been reported a wide range of magnitudes, directions and abrupt reversals for ohmic toroidal rotation studies, no clear physical mechanisms are concluded to explain these intrinsic ohmic rotation behaviors. Although the origin of the intrinsic ohmic rotation still needs intensive studies, the long-standing question for the direction of the ohmic rotation could be speculated from precise experimental evidences measured from cross validated diagnostics since KSTAR equips two main diagnostics. The core ohmic toroidal rotation has been measured mostly in the counter-current direction with normal operation conditions and the corresponding scaling is reported from KSTAR. Recently, we expanded the ohmic rotation scaling to the co-current direction for the first time utilizing lower electron density regimes. In this presentation, we will investigate the critical clue for the ohmic rotation direction and extended scaling to the co-current direction.

Country or International Organization

Korea, Republic of

Paper Number

EX/P7-4

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Session Classification: P7 Posters