Toroidal Rotation and Momentum Transport Studies in KSTAR Plasmas

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- In the ohmic plasmas, the direction and magnitude of the core rotation strongly depends on the initial plasma conditions during the plasma current ramp-up phase, and measured ion thermal Mach number is proportional to the normalized plasma pressure.
- The core toroidal rotation was slowed down by the fuelling-gas puffing and supersonic molecular beam injection regardless of the direction of the toroidal rotation.
- In the NBI heated plasmas, the core toroidal rotation is proportional to the ion temperature up to ~ 3 keV, and then it is saturated to ~ 300 km/sec with the ion temperature up to 4 keV. This observation was considered with the NUBEAM and TRANSP simulations focusing on the effects of the beam energy, heat and momentum transport.
- A strong braking of the toroidal rotation from an n=1 magnetic perturbation enhanced a locked-mode and its characteristic was simultaneously compared with the locked-mode induced without external magnetic perturbations since both phenomena were measured during the same discharge.