## **Rotation Reversal in KSTAR and Its Turbulence and Transport Characteristics**

## Co- to counter-current rotation reversal is observed in the KSTAR Ohmic L-mode plasmas.

- > Rotation reversal is related to the rotation gradient change  $(u' \equiv -(R/v_{th,i})dV_{\phi}/dr)$
- ➤ Using KSTAR Ohmic L-mode database,
  1) The value of u' in the gradient region linearly depends on  $R/L_{T_i}$ ,  $R/L_{n_e}$ , and  $\log(v_{eff})$ .
  - 2) The value of u' outside of the gradient region is fairly independent of  $v_{eff}$
  - 3) The position of the gradient region depends on  $q_{95}$
- → These characteristics are important to reveal the underlying physics of the intrinsic torque

## Turbulence and transport characteristics were investigated in experiments and gyrokinetic calculations for the rotation reversal in KSTAR.

- From fluctuation spectra measured by MIR and linear gyrokinetic calculations
   1) No clear transition from the TEM to the ITG mode was observed
   2) In the gradient region, TEM is dominant during the rotation reversal
- From perturbative analysis in KSTAR u' change during the rotation reversal could mainly result from the decrease of the momentum diffusivity rather than the change of the intrinsic torque
- From nonlinear gyrokinetic calculations, Stabilizing TEM with the increase of the collisionality and the decrease of  $T_e/T_i$  could result in the rapid decrease of the diffusive momentum transport

## D.H. Na et al EX/P4-19