

# EX/P8-12: Helical modes induced by localized current perturbations in sawtoothing KSTAR plasmas

G.S. Yun  
POSTECH, Korea

Multiple flux tubes (MFTs), a universal feature in plasmas with localized ECH heating

- Dynamics of MFTs visualized by 2D imaging: growth, steady-state (~ms), merging (~10  $\mu$ s), and crash (~10  $\mu$ s).
- Number of flux tubes strongly depends on the ECH position relative to  $q=1$  surface.

Nonlinear Reduced MHD simulation with an empirical current source model:

- 1) Flat  $q$ -profile ( $|1 - q| < 0.5\%$ ) after crash
- 2) Growth and saturation of  $m/n=1/1$  helical flux tubes driven by localized ECH
- 3) Merging of flux tubes

Ongoing study focuses on:

- 1) Dependence on the ECH injection angle (i.e., width and amount of the driven current)
- 2) Identification of  $q$  profile after sawtooth crash
- 3) Self-consistent modeling of the ECH coupling with the flux tubes

