Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Energetic ion excited long-lasting "sword" modes in tokamak plasmas with low magnetic shear XIAOGANG WANG, RUIBIN ZHANG, WEI DENG, YI LIU, Peking University — An m/n =1 mode driven by trapped fast ions with a sword-shape envelope of long-lasting (for hundreds of milliseconds) magnetic perturbation signals, other than conventional fishbones, is studied in this paper. The mode is usually observed in low shear plasmas. Frequency and growth rate of the mode and its harmonics are calculated and in good agreements with observations. The radial mode structure is also obtained and compared with that of fishbones. It is found that due to fast ion driven the mode differs from magnetohydrodynamic long lived modes (LLMs) observed in MAST and NSTX. On the other hand, due to the feature of weak magnetic shear, the mode is also significantly different from fishbones. The nonlinear evolution of the mode and its comparison with fishbones are further investigated to analyze the effect of the mode on energetic particle transport and confinement.

Xiaogang Wang
Peking University

Date submitted: 11 Jul 2013 Electronic form version 1.4