Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Preliminary experimental observation of nonlocal transport due to SMBI on the J-TEXT tokamak JINSHUI XIAO, ZHOUJUN YANG, GE ZHUANG, CHI ZHANG, MINGHAI LIU, Huazhong University of Science and Technology, STATE KEY LABORATORY OF ADVANCED ELECTROMAGNETIC ENGINEERING AND TECHNOLOGY TEAM — Experimental studies of nonlocal electron heat transport have been carried out in J-TEXT ohmic plasmas exploiting Supersonic Molecular Beam Injection (SMBI) system. By cooling the very edge plasma, a prompt ($\sim$1ms) temperature rise of the plasma core can be induced. For a low density discharge with ne = 1.1×10^{19} m^{-3}, the amplitude of ΔTe/Te exceeds 30% at r/a=0.17 (a is the minor radius). The duration of NLT phenomena is about 10ms, which is comparable with the energy confinement time of J-TEXT. The Te inverse radius in this discharge locates at r/a= 0.33 $\sim$ 0.4 and is outside the q=1 surface (r/a $\sim$ 0.3), which the latter is estimated from the sawtooth inverse position. As plasma density increases, the nonlocal phenomena decay. Repetitive nonlocal phenomena can be induced by modulated SMBI, which distinctly exhibits the strong dependence on electron density. The critical density is about 1.6×10^{19} m^{-3}.

Jinshui Xiao
Huazhong University of Science and Technology

Date submitted: 09 Jul 2014 Electronic form version 1.4