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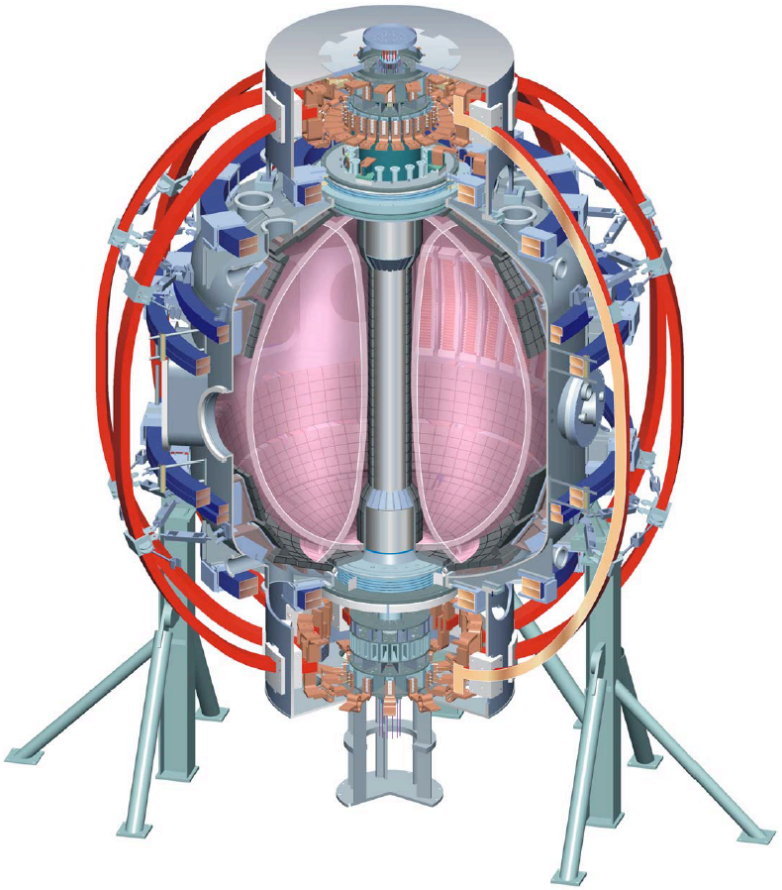
NSTX

# High-k turbulent fluctuations during HHFW heating

## (XP-735)



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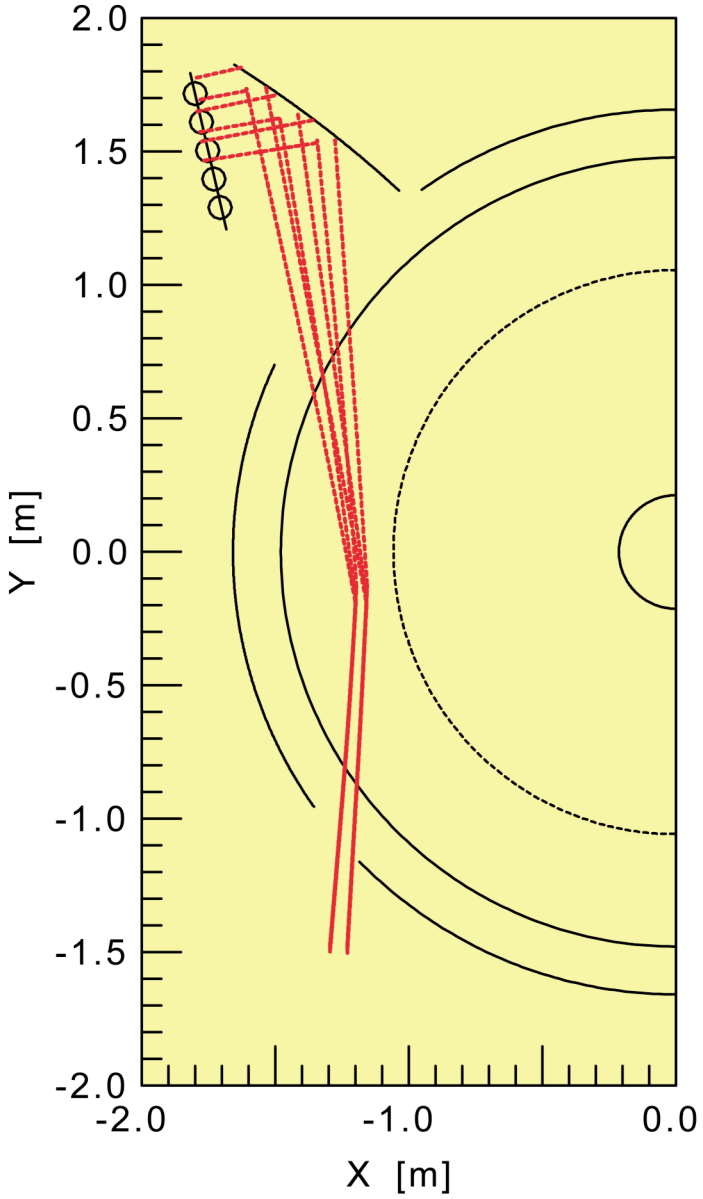
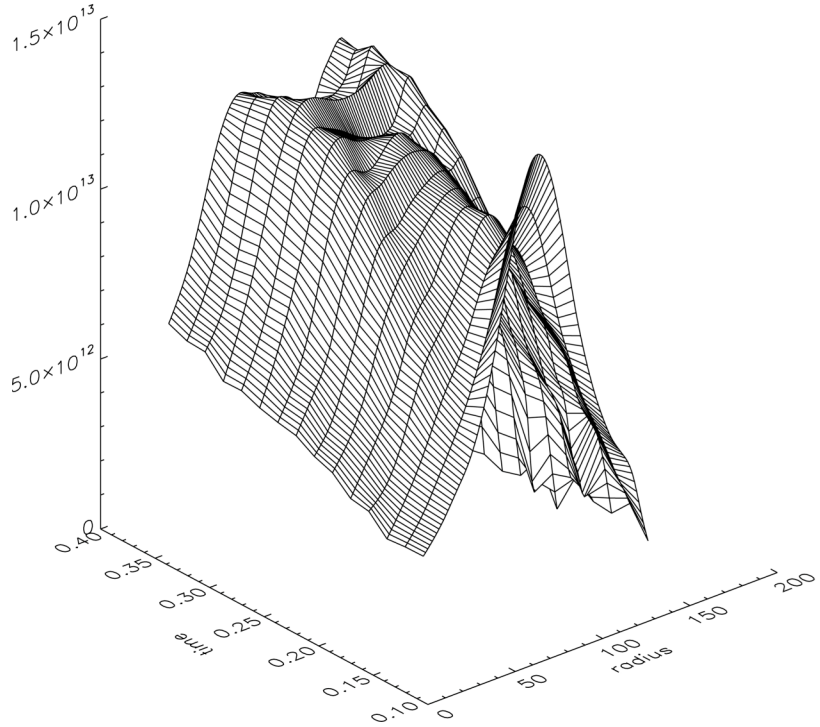
[3]Pohang University of Science and Tecnology

NSTX Results Review
July 23-24, 2007

- *The goal of the high-k scattering project is to verify whether the existence of a turbulence driven by $\nabla T_e$ is responsible for electron anomalous transport in NSTX*
- *The objective of XP-735 was to search for such a turbulence*
- *Measurements in plasmas heated by HHFW – best available tool in NSTX for controlling and modifying the gradient of $T_e$*
- *Fluctuation measurements with 280 GHz coherent scattering: $k$=7–14 $cm^{-1}$, $f < 4$ MHz*



124901_ne.ps

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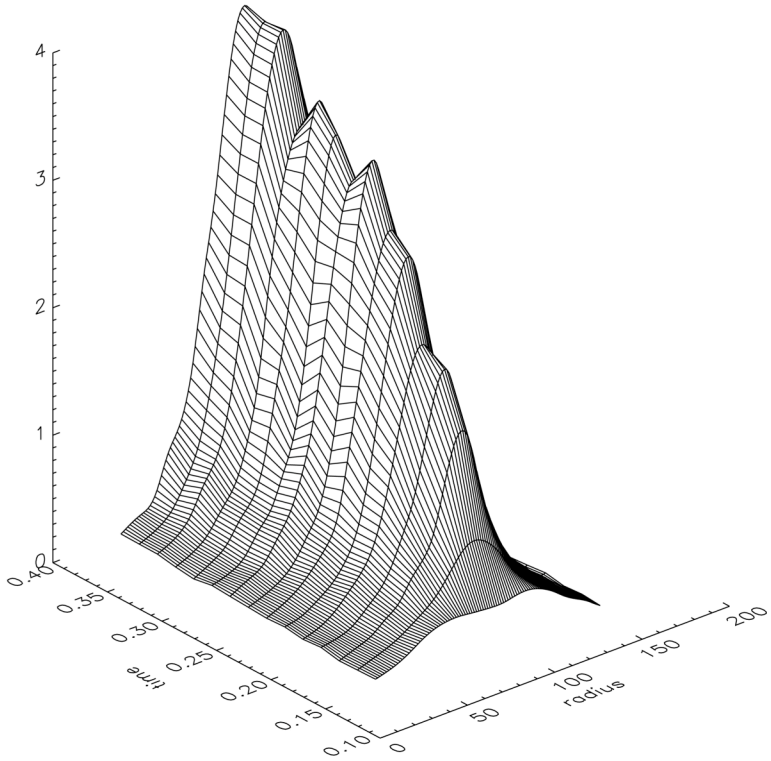
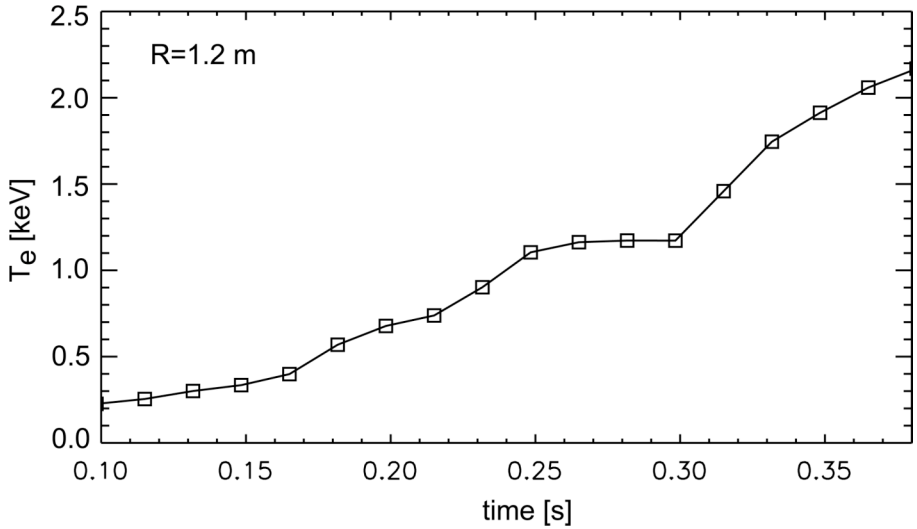
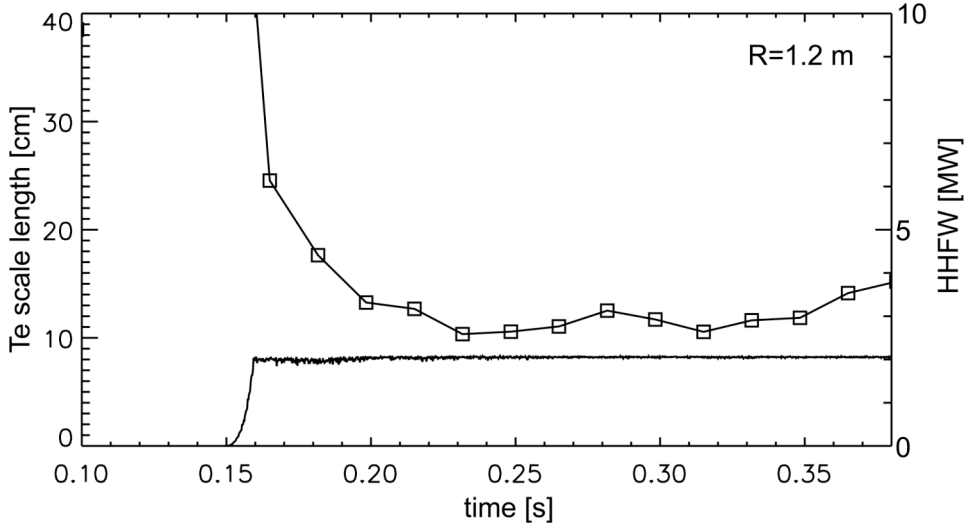
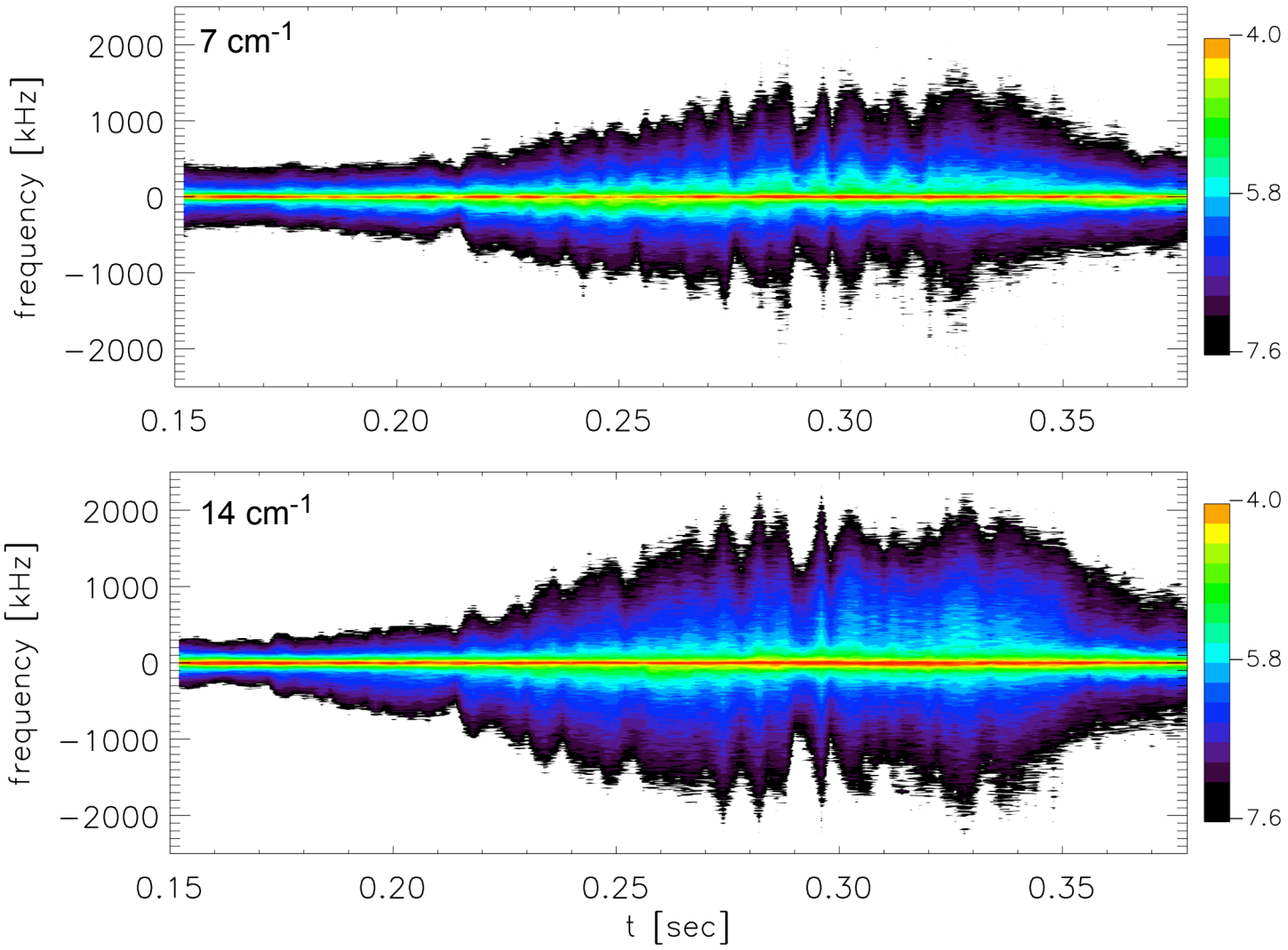
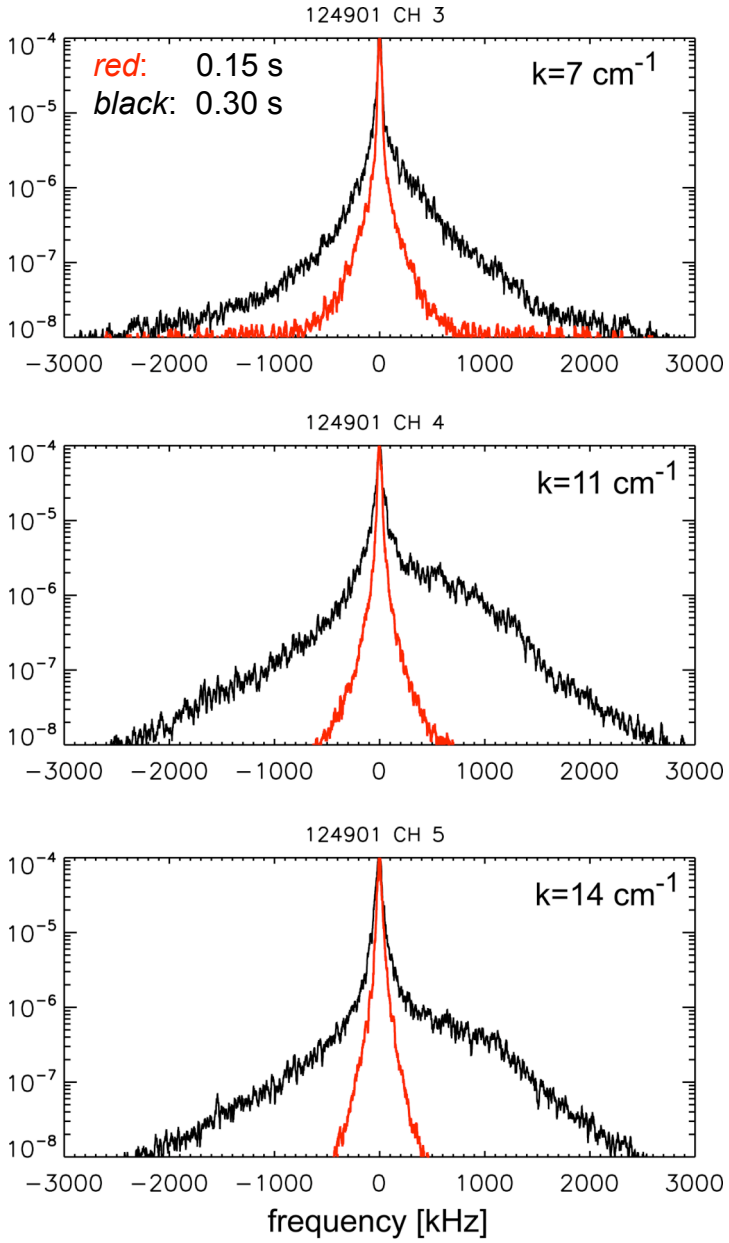
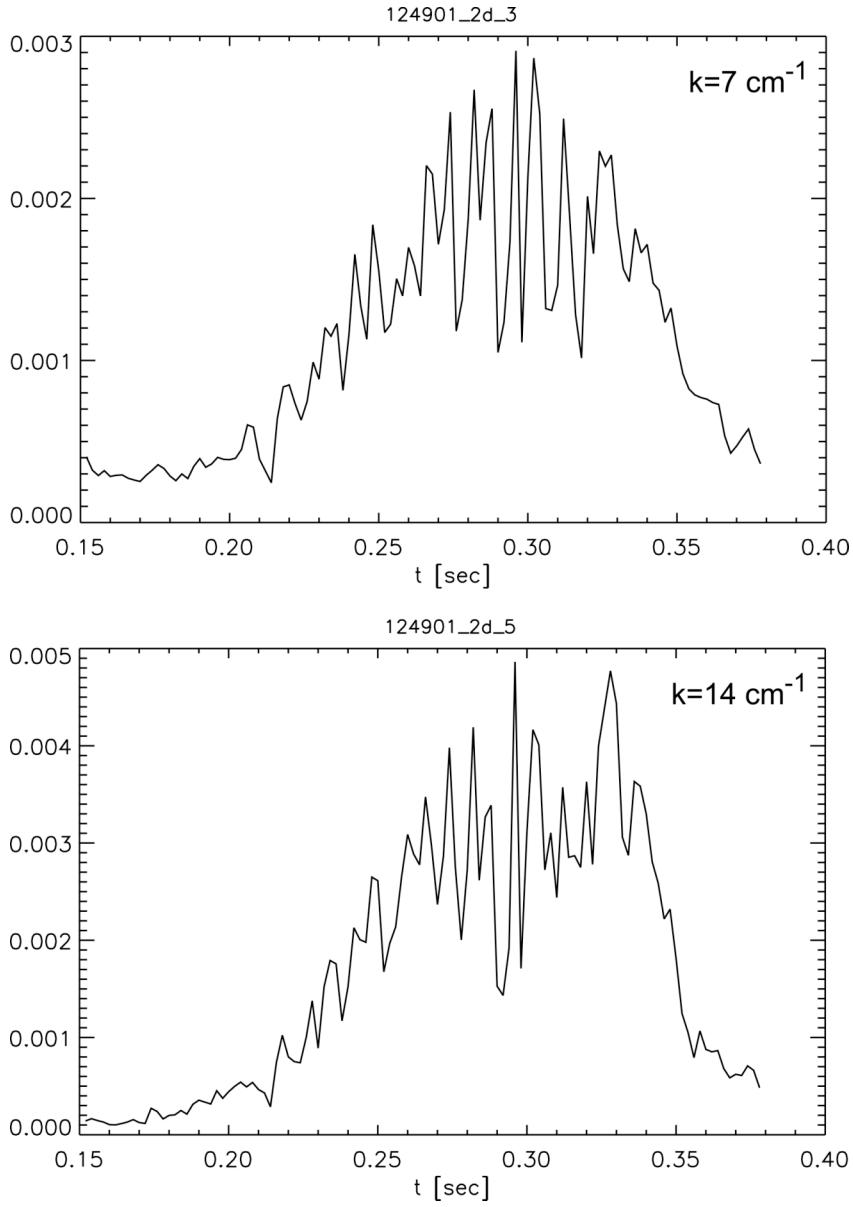


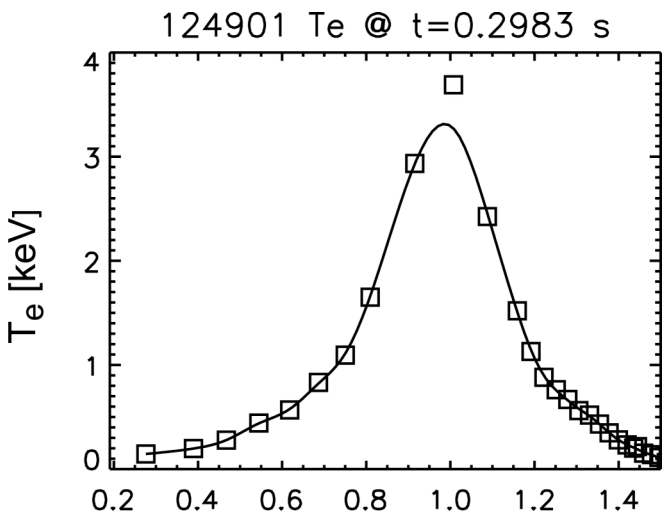



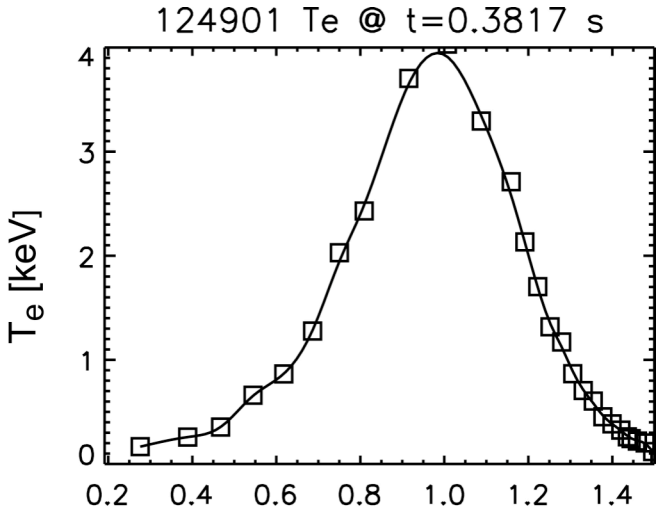



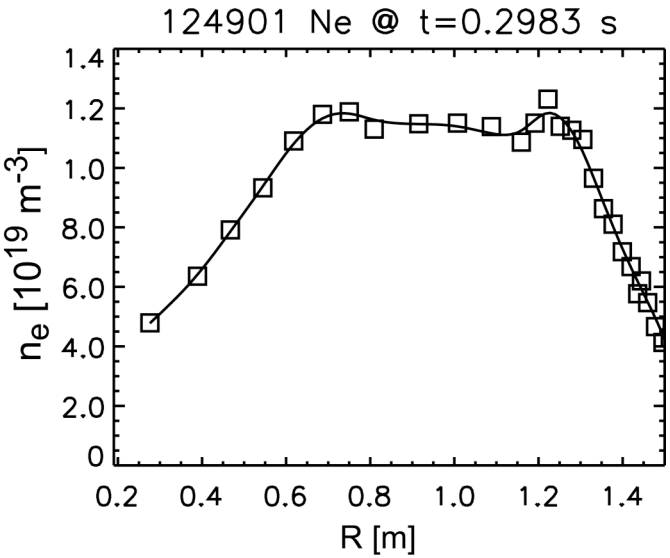

7 cm-1
14 cm-1
frequency [kHz]
2000
1000
0
−1000
−2000
0.15
0.20
0.25
0.30
0.35
t [sec]
4.0
5.8
7.6

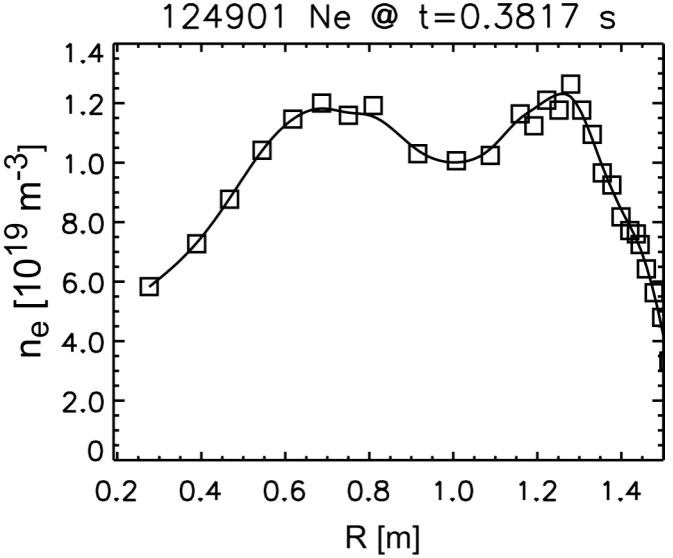

124901 CH 3
red: 0.15 s
black: 0.30 s
k=7 cm-1
124901 CH 4
k=11 cm-1
124901 CH 5
k=14 cm-1
frequency [kHz]


124901_2d_3
k=7 cm-1
t [sec]
124901_2d_5
k=14 cm-1
t [sec]

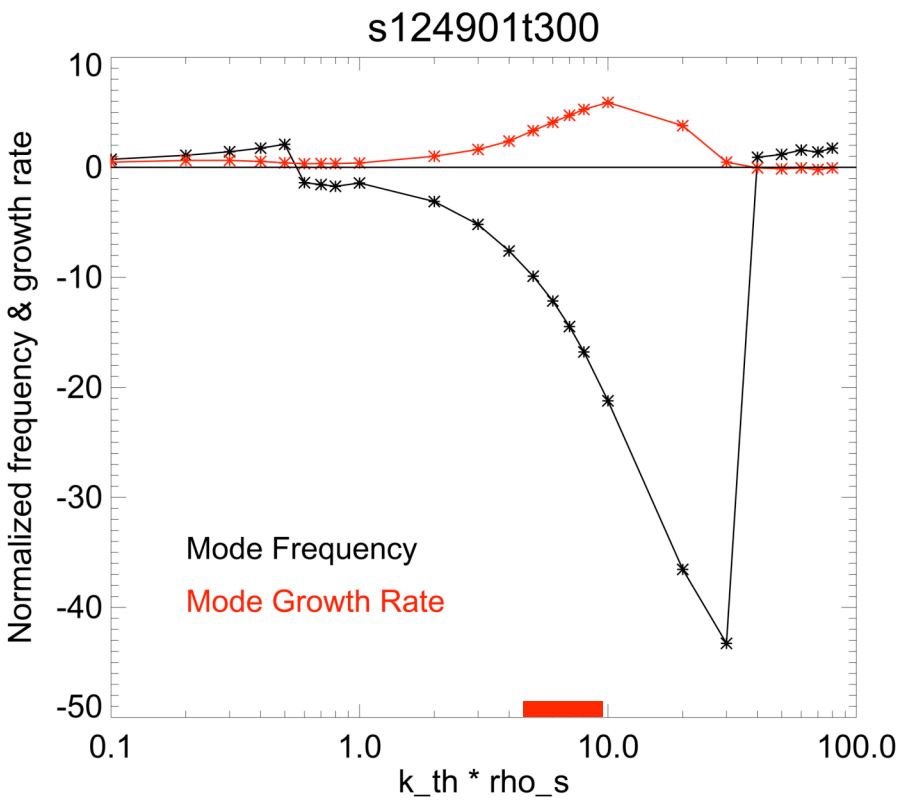


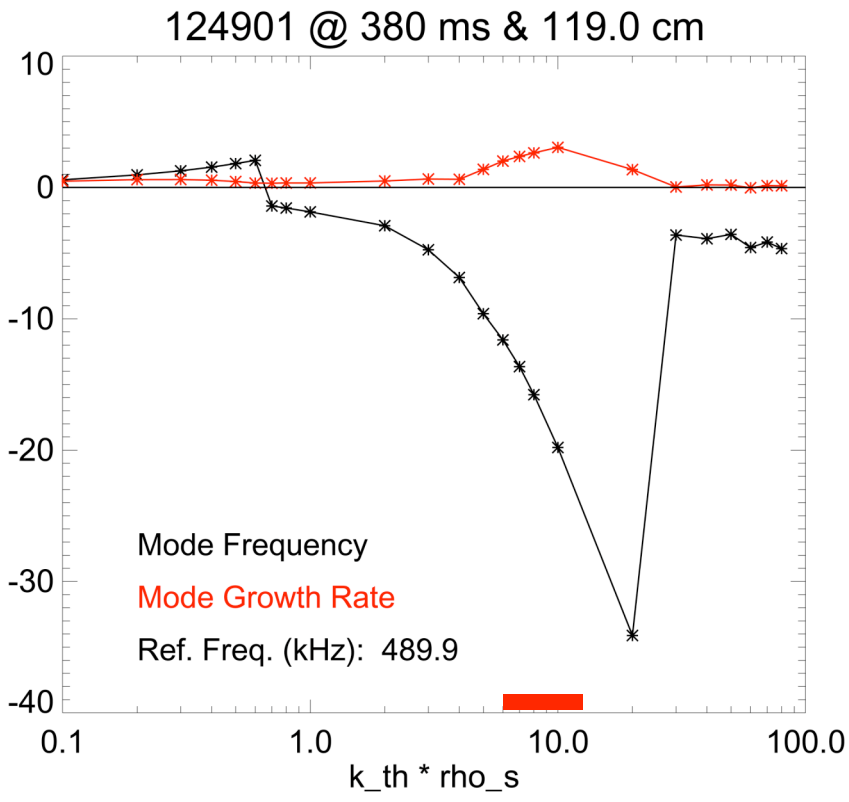




- *Drop in fluctuations coincides with formation of a density hole in plasma center*




- Qualitative agreement with predictions of GS2 code

## *Conclusion*

- *Results from XP-735 indicate the existence of turbulent fluctuations driven by the gradient of $T_e$ in NSTX plasmas*
- *Results are in qualitative agreement with predictions of the GS2 code for the ETG mode*
- *Additional work is needed for a more conclusive identification of observed fluctuations*