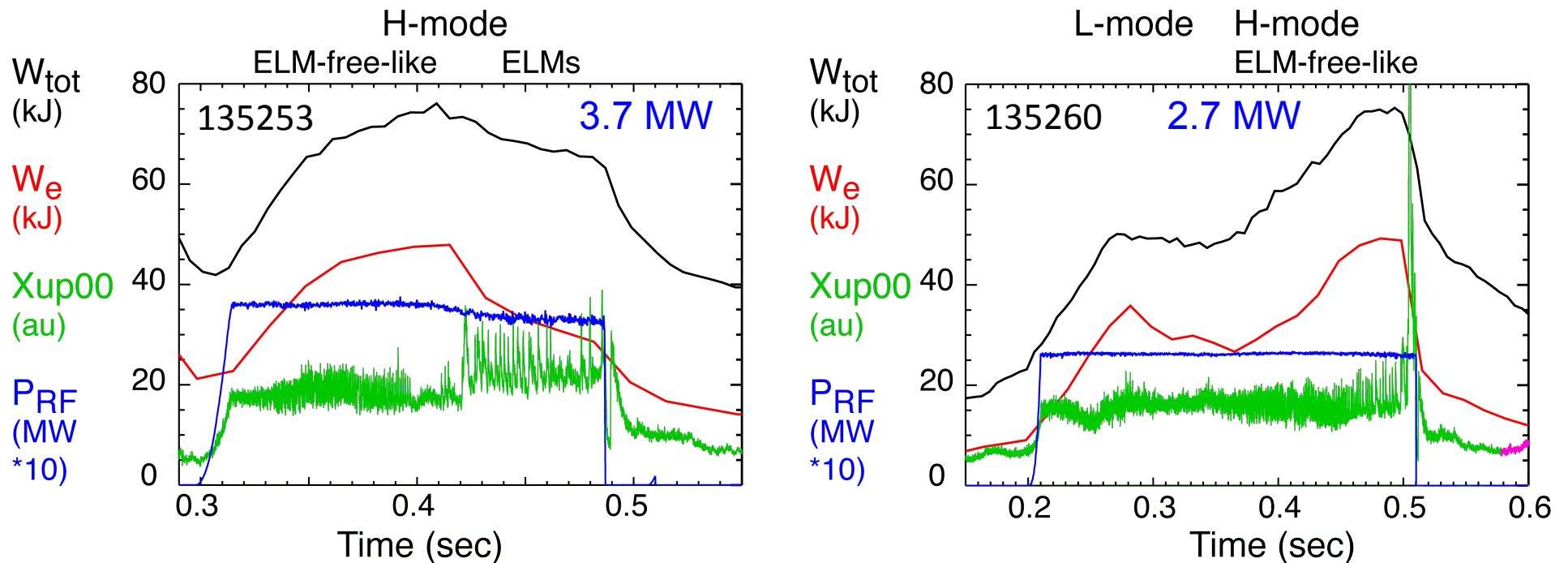


XP 1: Turbulence characteristics for HHFW H-mode saturated stored energy versus HHFW power

J. Hosea, Yang Ren, Ernesto Mazzucato, David Smith, et al.

- Maximum stored energy during the ELM-free-like phase of the HHFW electron heating generated H-mode appears to be independent of P_{RF}
- Initial high-k scattering measurements suggest micro-turbulence increases substantially with P_{RF}
- Would like to investigate high-k and BES profile measurements as a function of P_{RF} with fall off of P_{RF} during the ELM-free-like phase of the HHFW H-mode
 - Should be able to discern turbulence role in change of transport with power

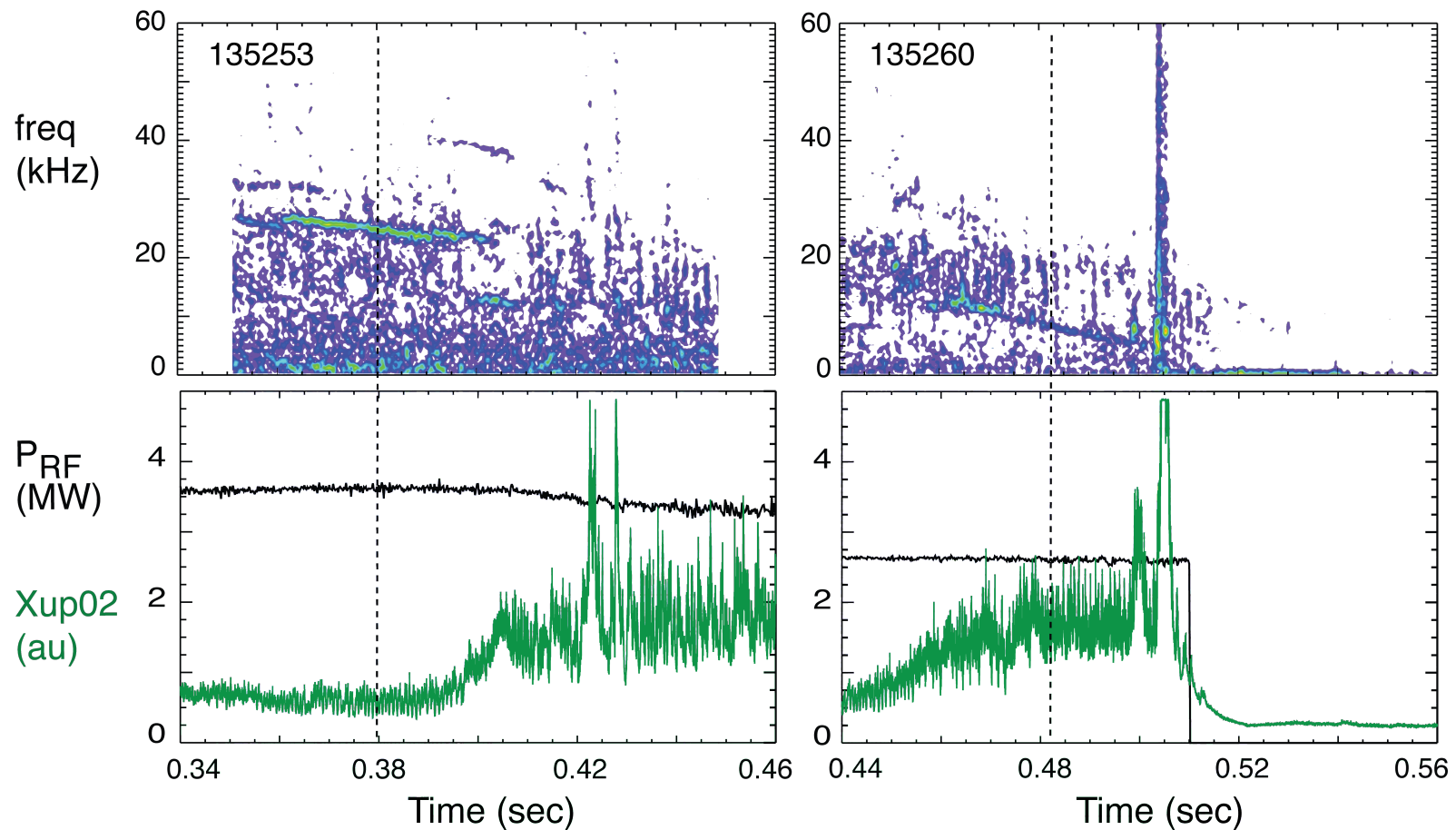
Stored energy in ELM-free-like HHFW H-mode saturates at same level when P_{RF} is reduced from 3.7 MW to 2.7MW



- Stored electron energy and total energies reach similar values prior to onset of large ELMs
- MHD shows no Alfvén eigenmodes and Mirnov MHD is only present for frequencies below ~ 50 kHz
- Suggests that micro-turbulence increases with P_{RF} leading to an increase in transport

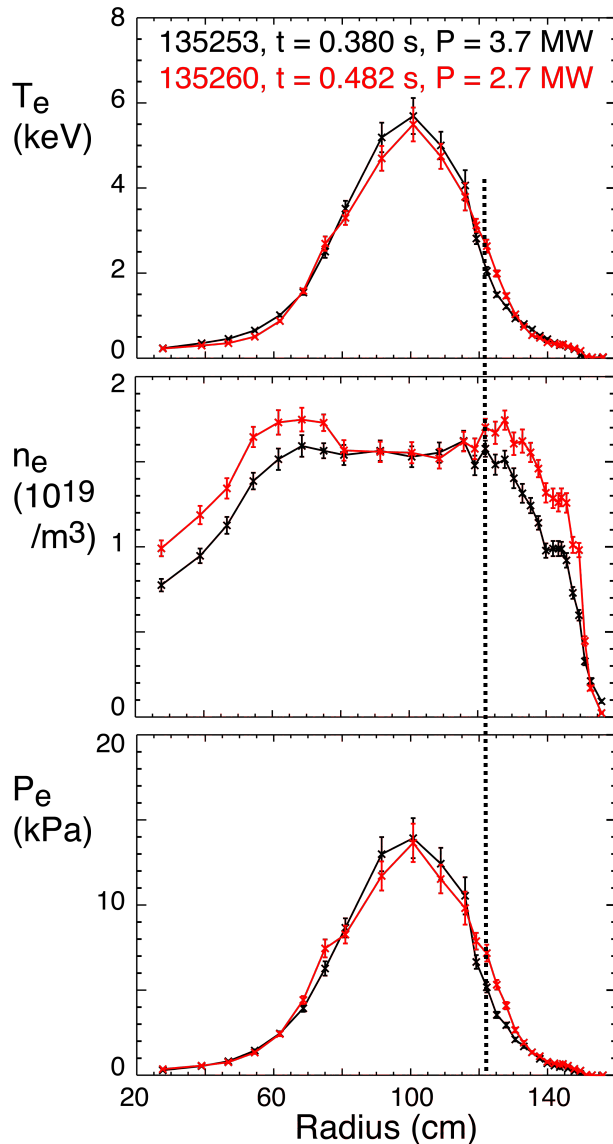
MHD is reduced at frequencies $< \sim 50$ kHz when P_{RF} is reduced from 3.7 MW to 2.7MW

Comparison of MHD spectra for 135253 $t = 0.38$ s, 135260 $t = 0.482$ s



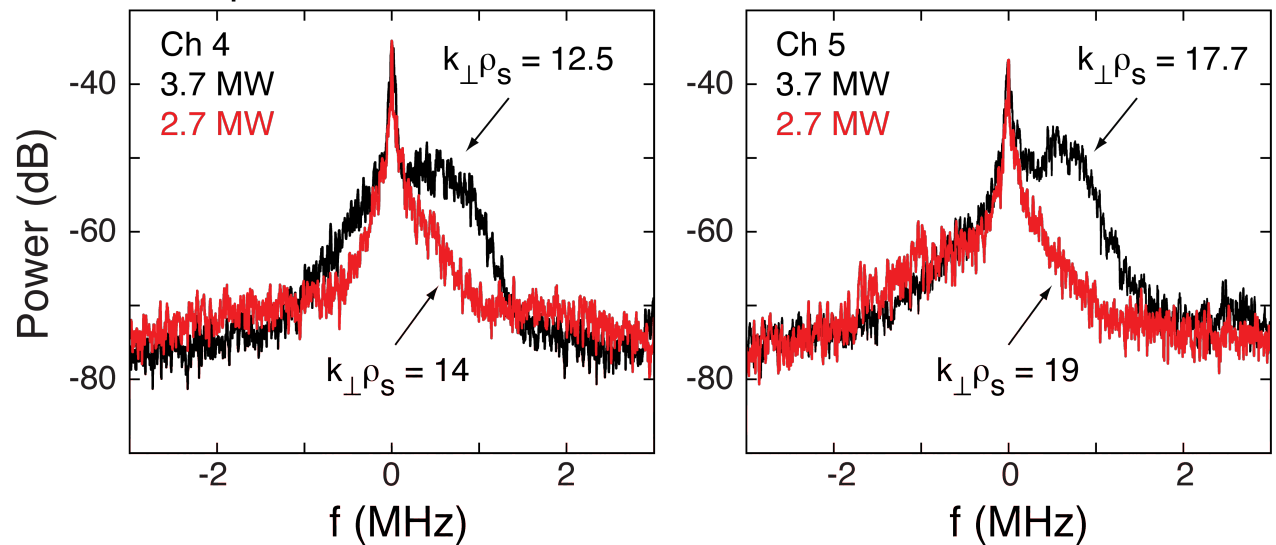
- MHD shows no Alfvén eigenmodes and Mirnov MHD is only present for frequencies below ~ 50 kHz
- Turbulent spectra is indicated without large coherent modes

Initial high-k scattering measurements indicate that ETG turbulence increases with RF power



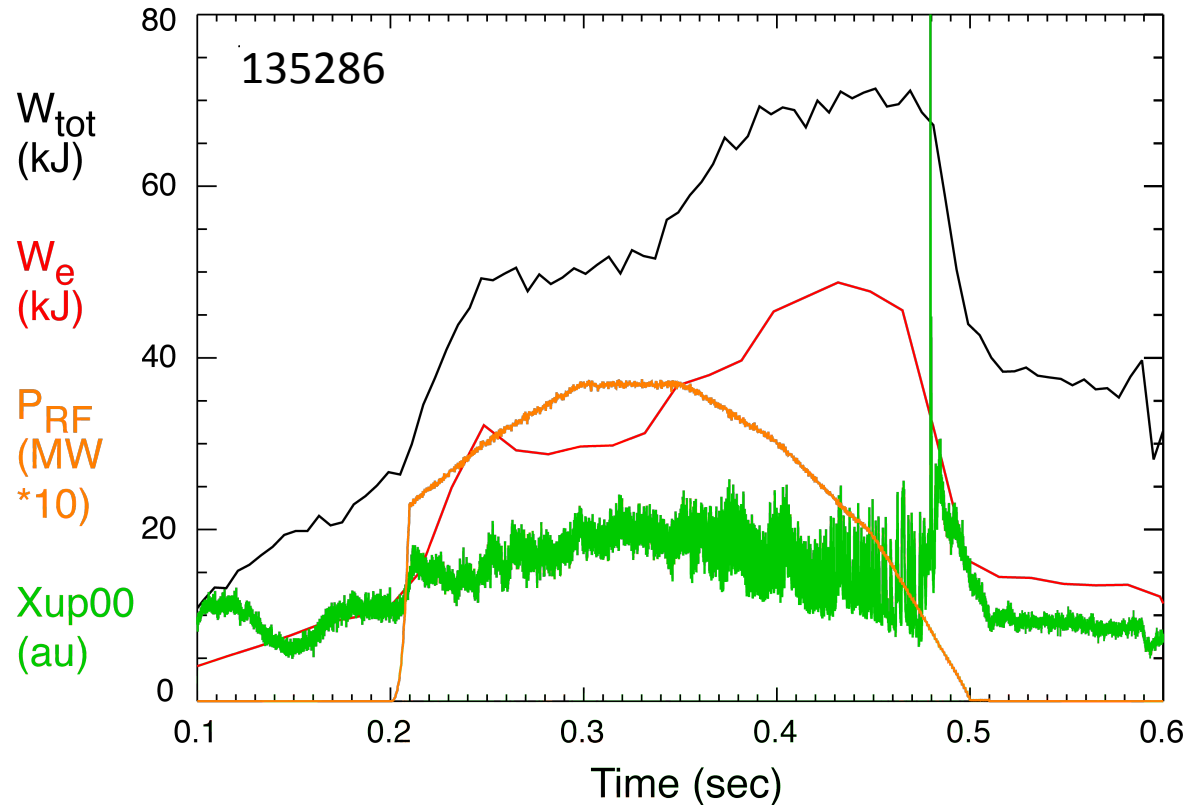
High-k scattering spectra vs RF power

Comparison for 135253, $t = 0.38$ s and 135260, $t = 0.482$ s



- Increase in high-k turbulence may cause the observed saturation of stored energy with increasing RF power

Stored energy saturates during the fall of P_{RF} in ELM-free-like H-mode period



- Both W_{tot} and W_e begin to increase just prior to the end of the 3.7 MW flat top of the RF power waveform
- Both stored energies attain values during the RF power ramp down comparable to the previous levels shown for 3.7 MW and 2.7 MW flat RF power pulses
- A strong change in radial transport is indicated vs P_{RF} and measurements of high-k scattering and BES should permit roles of ETG and ITG turbulence to be discerned