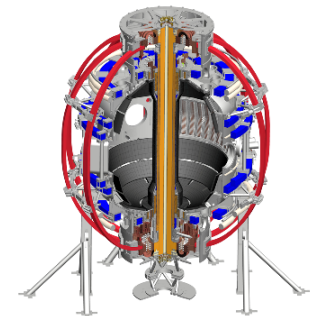# 2D BES Commissioning and Initial Results

Matt Kriete, Dave Smith
R. Fonck, G. McKee

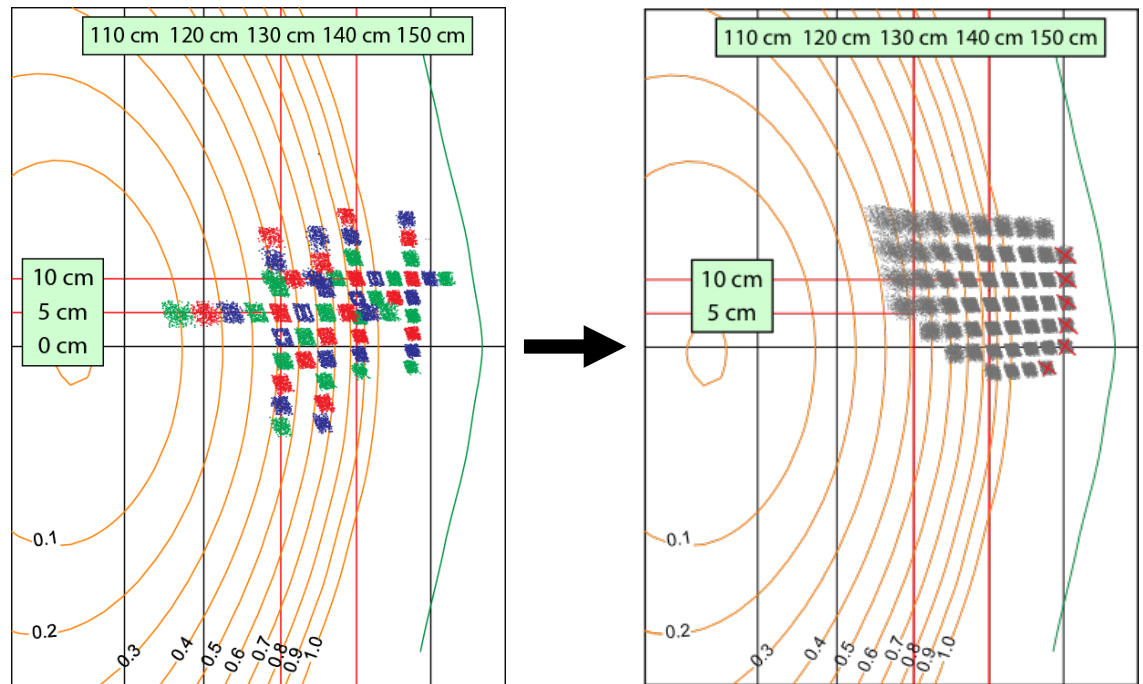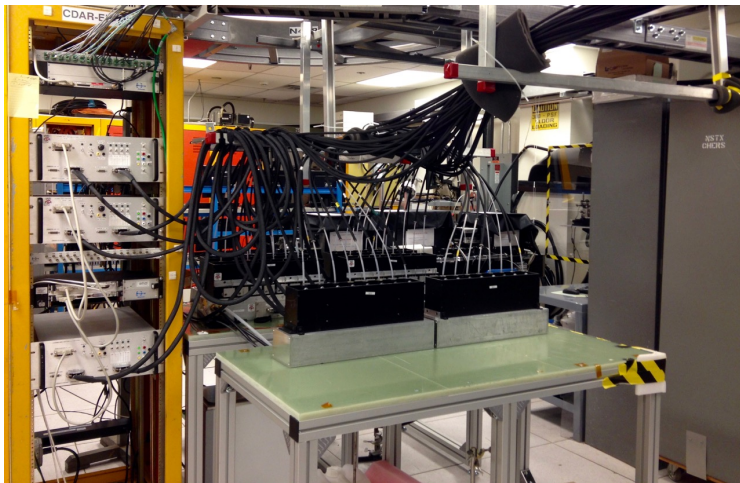NSTX-U Results Review 2016

WISCONSIN
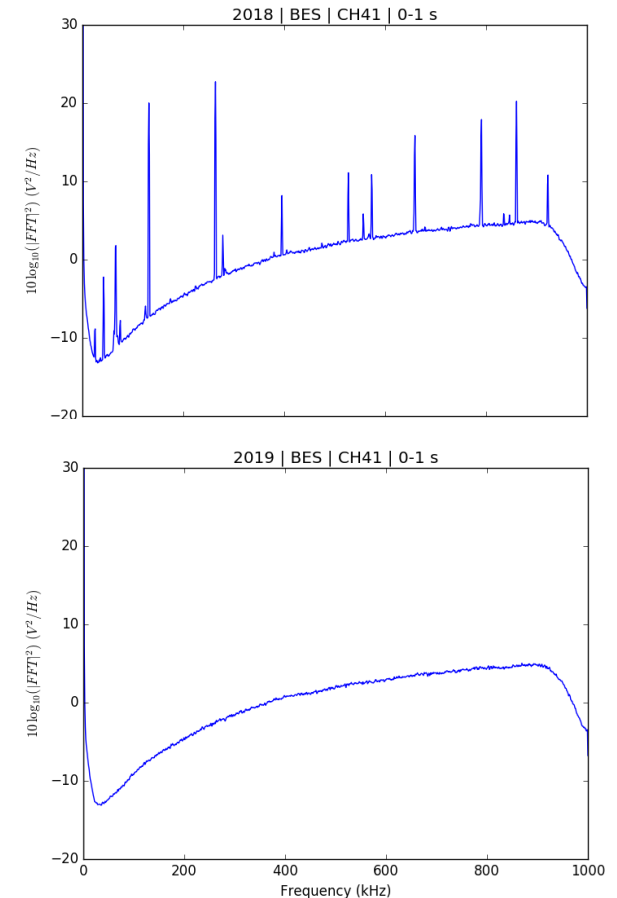UNIVERSITY OF WISCONSIN–MADISON

PPPL

BES system was reconfigured

- **BES system expanded from 32 to 48 channels**
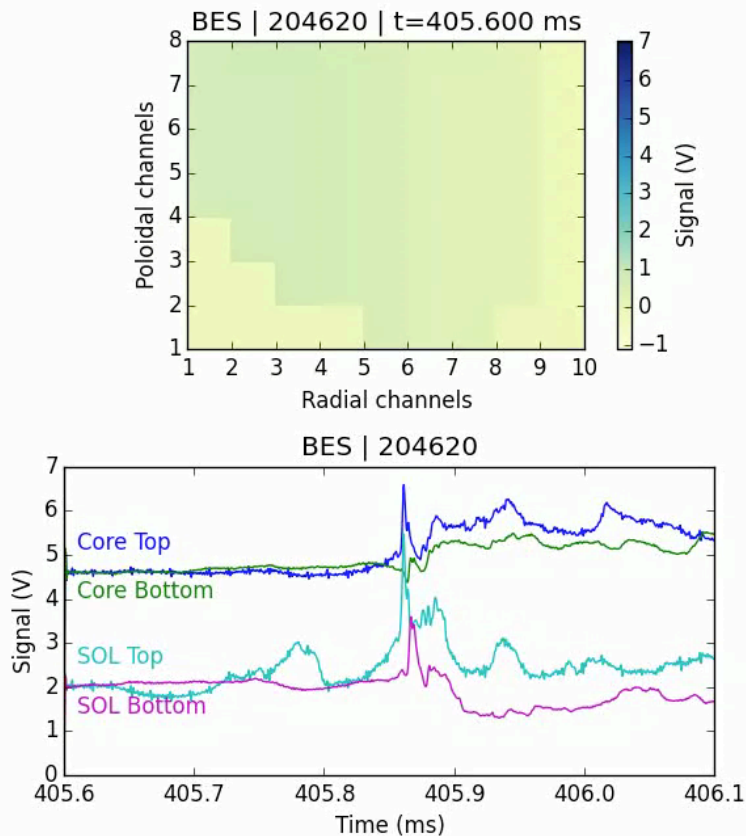 - 2D turbulence imaging
  - 2D flow analysis

Expanded BES system has been debugged

- Noise pickup on most channels
  - 8 noise-free, 8 low-noise channels
  - Found proper grounding configuration after end of plasma ops

- f_{sample} mismatch between digitizers
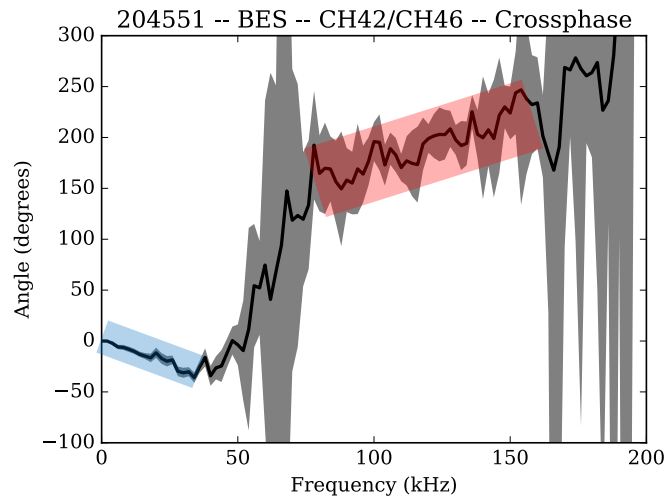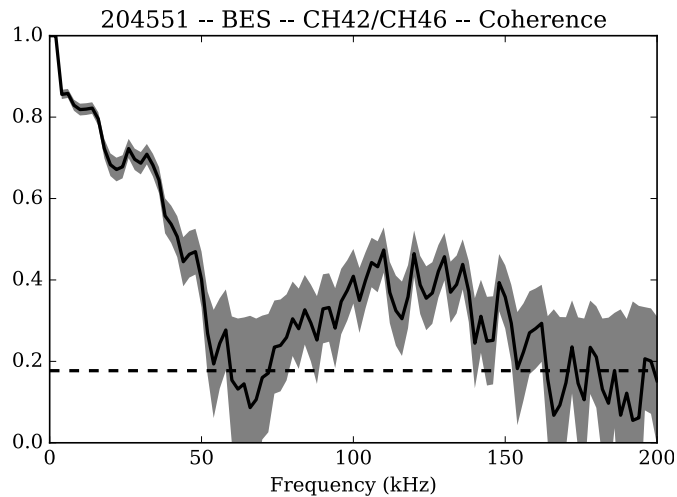 - Debugged by Greg Tchilinguirian

2D ELM structure observed

D. R. Smith, HTPD 2016 Invited Talk
Investigation of ELM Evolution Patterns on NSTX-U with Beam Emission Spectroscopy Measurements

D. R. Smith, IAEA FEC 2016

Bimodal turbulence seen in a L-mode shot

204551 -- BES -- CH42/CH46 -- Coherence

204551 -- BES -- CH42/CH46 -- Crossphase

ΔZ = 3 cm
R = 142 cm
Δt = 24 ms

13 km/s in electro
diamagnetic direc
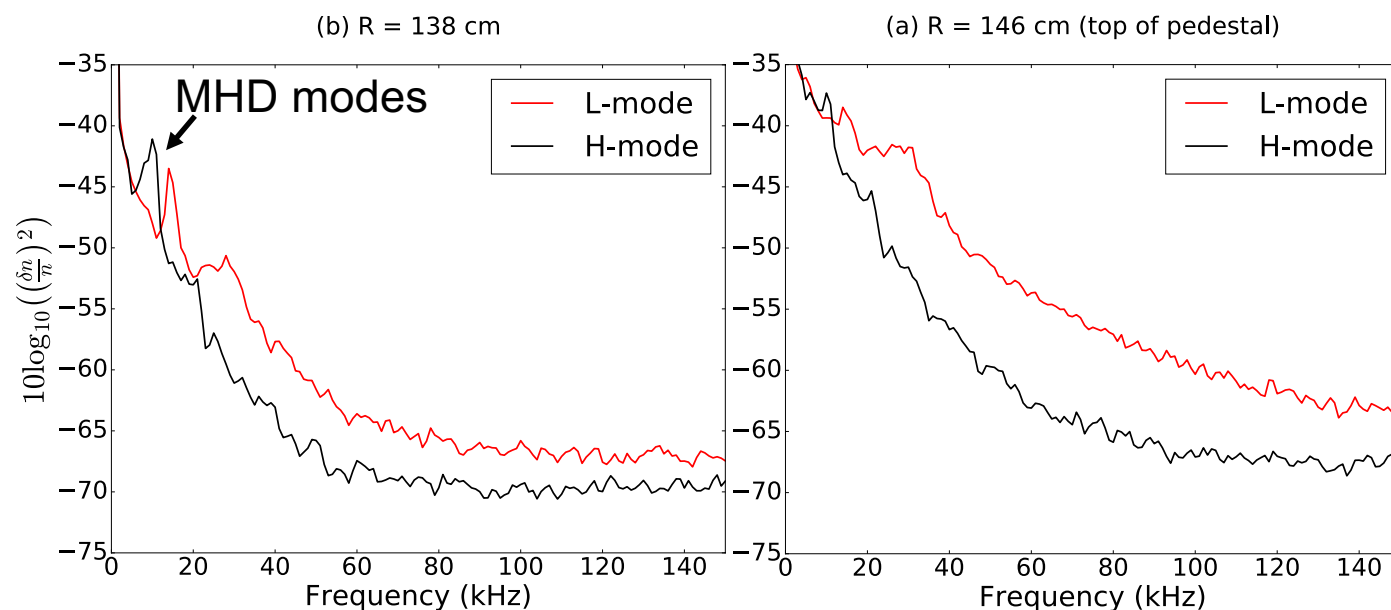
11 km/s in ion
diamagnetic direc

- Modes propagate in opposite directions
  - Similar spectra seen with DIII-D and TFTR BES
  - Potential link to grad B direction

Turbulence amplitudes decrease after L-H transition

- Fluctuation comparison between near and far edge

  – 6x reduction at pedestal top

  – 3x reduction inward of pedestal

D. M. Kriete, APS DPP 2018, shot 204990, I_p = 0.65 MA, P_{NB} = 1 M