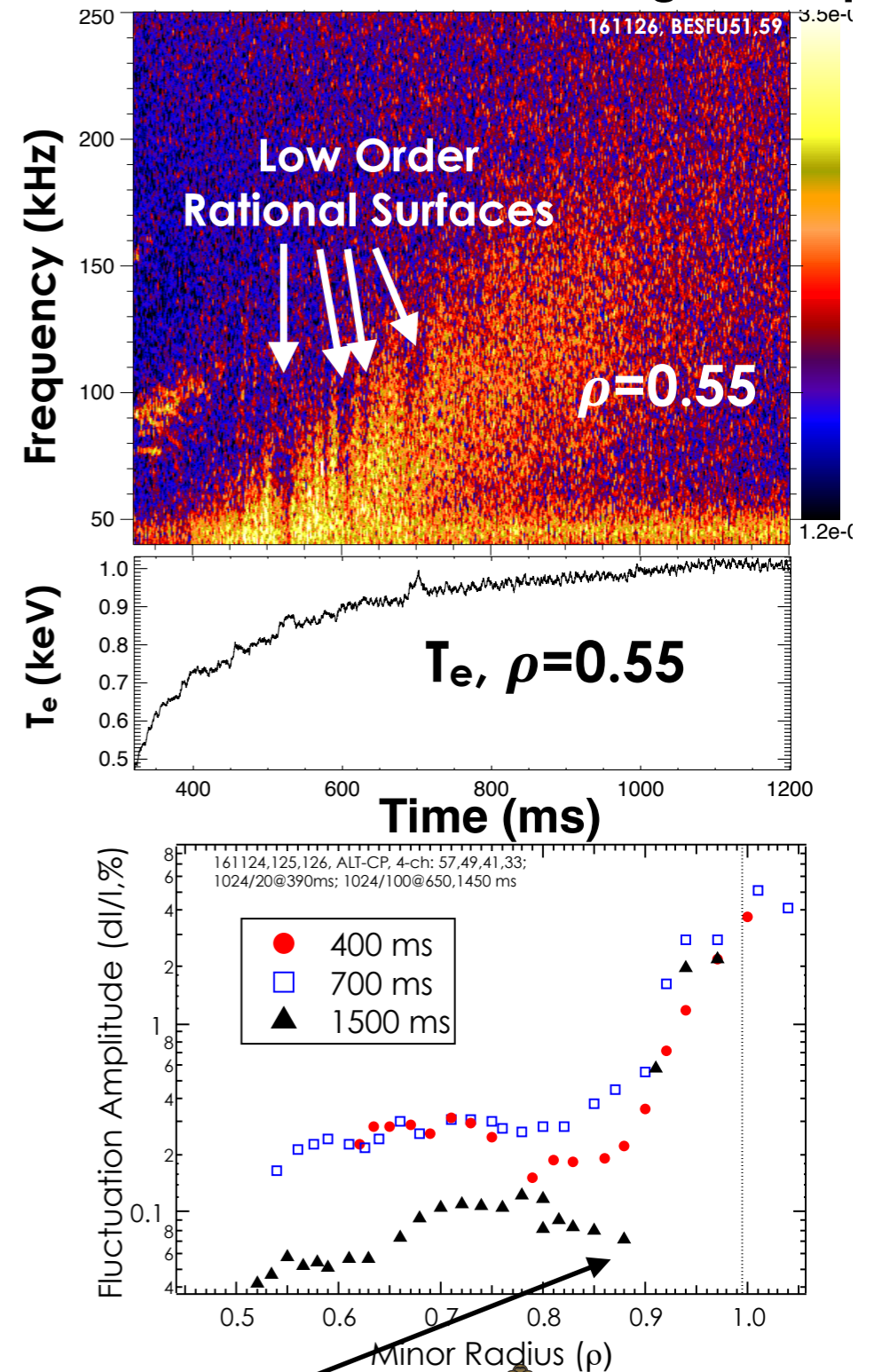# Turbulence Evolution During I_P Ramp Indicates Transiently Low Transport Zones that May Explain Model Discrepancies

- **Transport models during I_P ramp have under-predicted $T_e(\rho)$ and over-predicted inductance**
  - Impacts ohmic flux consumption and stability

- **Low-k turbulence measurements indicate:**
  - Turbulence suppression as low-order rational q-surfaces enter plasma and propagate radially
  - Regions of very low turbulence not observed during steady plasma conditions (e.g., $\rho=0.85$@1500 ms)
  - High-magnitude edge turbulence ($\rho>0.90$) exhibits "counter" propagation: different instability than core
  - Linear growth rate calculations indicate change in instability from TEM to ITG dominant during ramp-up

> **Measurement-simulation comparisons allowing for more accurate and complete transport models during Current Ramp-Up Phase**

Turbulence Evolution During I_P Ramp

Low Order Rational Surfaces

$\rho=0.55$

T_e, $\rho=0.55$

Very low turbulence zone

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