

Core turbulence in low density ITB plasmas



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Motivation:

- Nonlinear GS2 simulations indicate that turbulence plays a central role in the sustainment of ITBs.
- Localized density fluctuation measurements in the peaked density region do not exist.
- Line integrated PCI density fluctuation measurements passing through the peaked density region display a strong increase in amplitude due to additional on-axis ICRF heating.

Method:

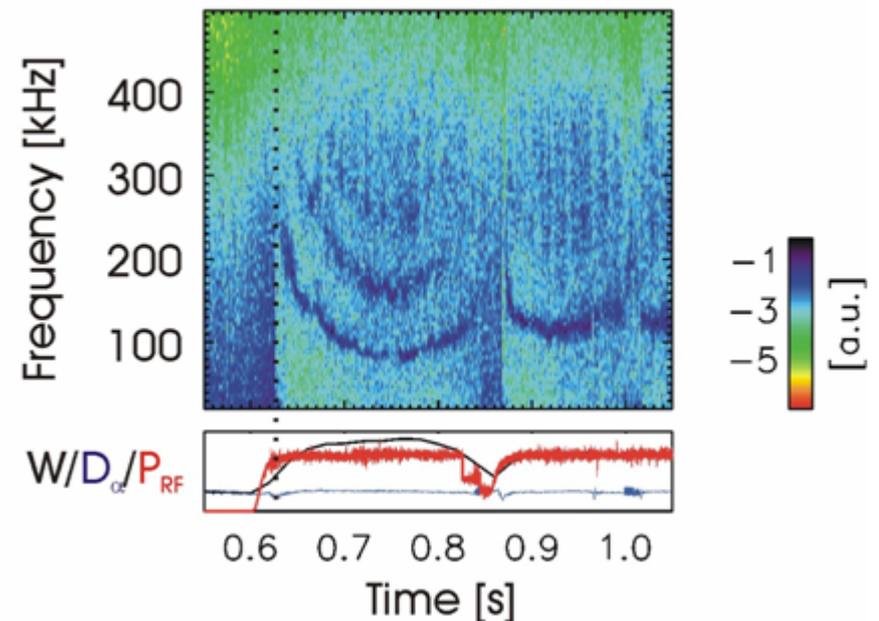
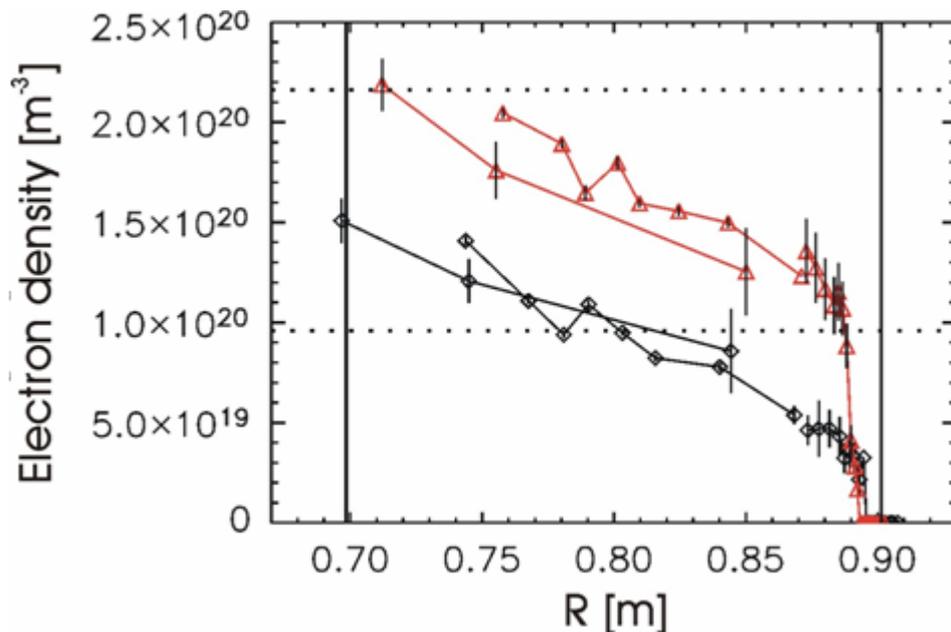
- Measure turbulence locally in the peaked density region using reflectometry; with and without on-axis heating. Compare to simulations.

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As target plasmas we will use low density, low current EDA H-modes developed by Amanda Hubbard in May 2003 (e.g. 600 kA shot 1030530020). Power deposition will be changed from on- to off-axis to enable ITB formation.

Thomson density profiles in L-mode (black) and low density EDA H-mode (red).

88 GHz reflectometry spectrogram showing two low density EDA H-modes.



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Once a suitable target plasma has been made, we would scan the density so the reflectometer channels reflect off different parts of the ITB.

Scans of on-axis heating power would follow. From PCI measurements we know there is a significant increase of non-localized turbulence in response to on-axis heating.

