

Core turbulence studies in ITB plasmas



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A number of issues and questions concerning the formation of ITB's in C-Mod remain.

Issues:

- Strongly peaked radiated power on axis.
- No central peaking or break in slope of temperatures.
- Target density threshold.
- Formation of the double transport barrier depends sensitively on the resonance location of the off-axis ICRH (RTP).

Questions:

- Mechanism for ITB formation with off-axis ICRH.
- ITB stabilization with on-axis ICRH.
- Generation of initial co-current core toroidal rotation.
- **Role of turbulence.**
- **Role of magnetic topology.**

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Alcator
C-Mod

We will address the role of turbulence and magnetic topology.

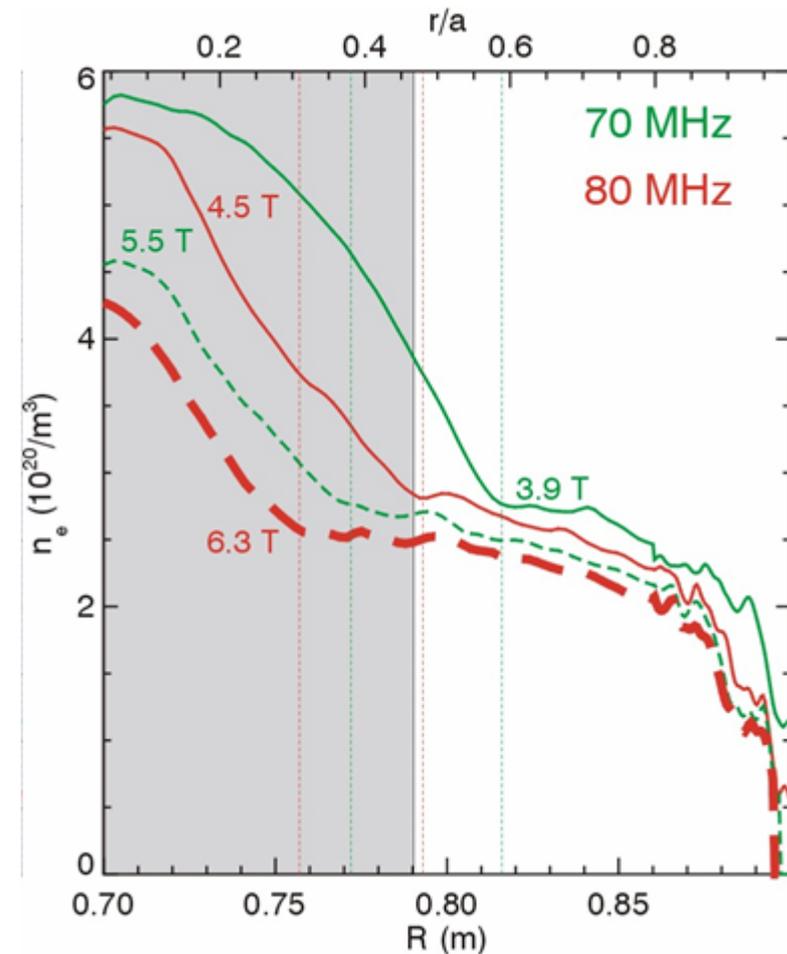
Primary diagnostics: PCI and reflectometry.

Focus on measurements of turbulence both inside the ITB, at the foot of the barrier and outside.

Is there a reduction of turbulence at/inside the ITB foot?

If yes, is it suppression of ITG modes due to $E \times B$ shear? Does ETG turbulence control the electron thermal transport?

Why does the QC-mode break up once the ITB is formed?



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Is it correct that q is not important for ITB formation?

Off-axis ICRH ITB's:

- PCI measurements: The upgrade from 12 to 32 channels enables coverage of fluctuations from the core to half minor radius. Possibly core $\delta n/n$ profiles can be constructed.

H- to L-mode, Li-pellet and Ohmic H-mode ITB's:

- Reflectometry measurements: For these cases, we can probe inside the barrier.

Investigate q -dependency of these ITB's.

Once LHCD is operational, fluctuations in the transmitted and reflected power will be measured. Will we be able to observe rotating $q=2/1$ magnetic islands (TEXTOR-94)?

