

# Controlled confinement transitions with low magnetic shear at the edge



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## Motivation:

- Confinement was very sensitive to the (edge) safety factor in the low magnetic shear W7-AS stellarator.
- A slight modification of the q-profile could be made by small, slow current ramps (0 to 2 kA).
- Transport barriers linked to low-order rational surfaces move radially as the q-profile is varied.

## Method:

- Make a target plasma with low edge shear using LHCD, thereafter ramp the plasma current slowly to change the q-profile.

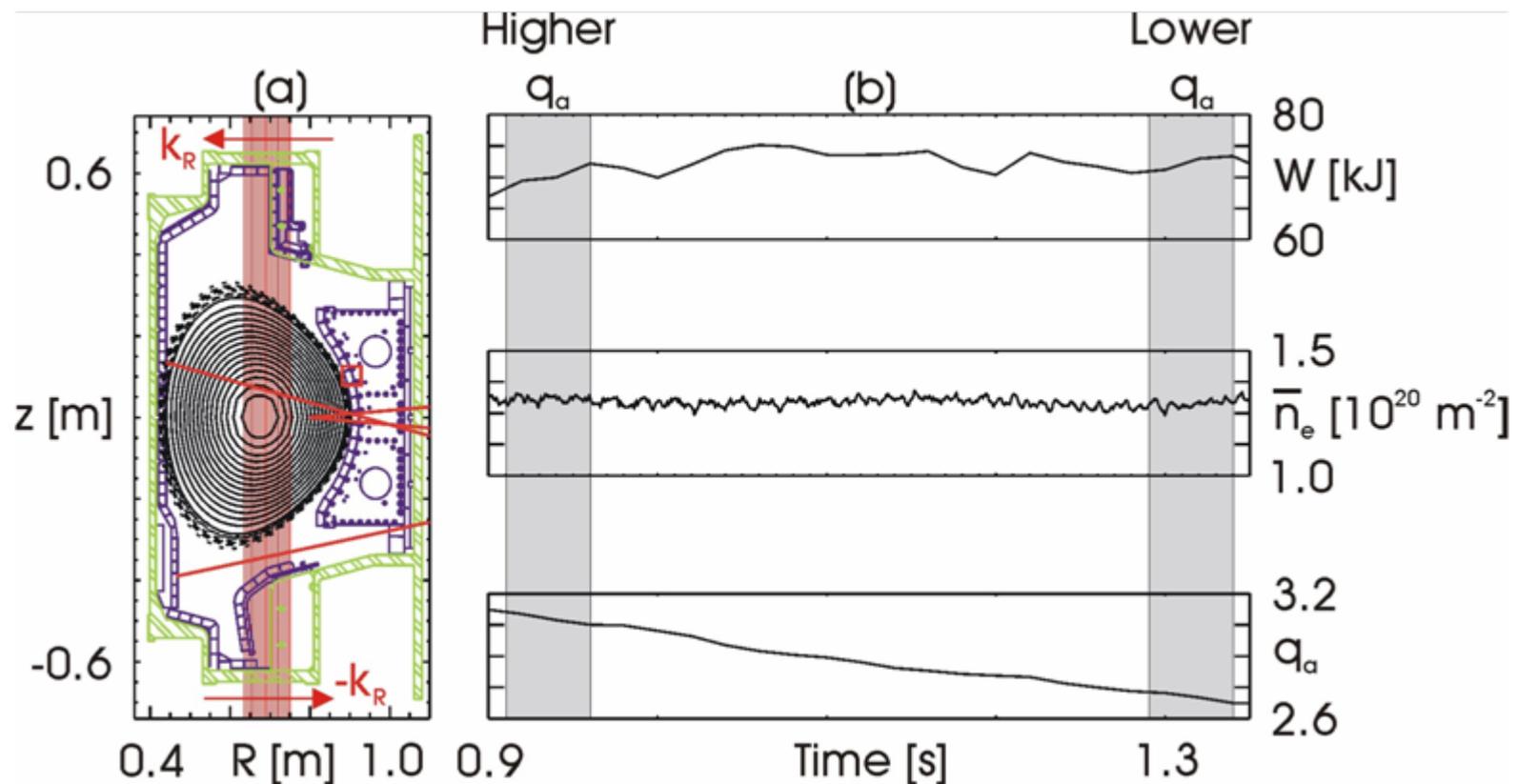
## Result:

- Create controlled confinement transitions, measure turbulence.

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Inner wall limited, low density L-mode plasmas have been developed in C-Mod as a part of ongoing current ramping experiments.

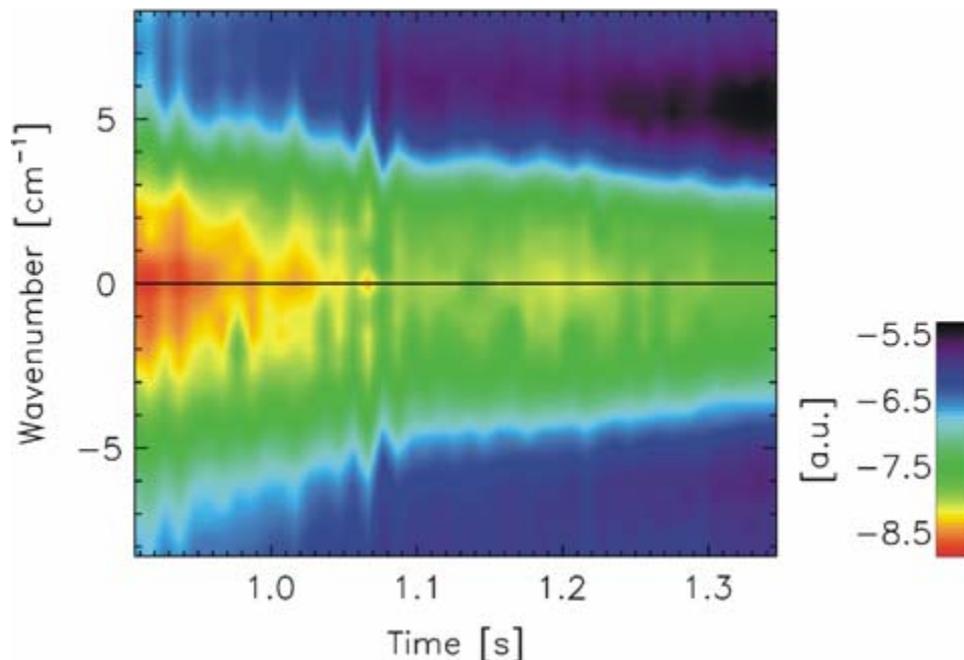
No global confinement changes have been observed so far, probably because of large shear in C-Mod compared to W7-AS.



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However, changes between the 'higher  $q_a$ ' and 'lower  $q_a$ ' states were observed when we correlated e.g. ECE and PCI measurements. Further, analyzing high frequency PCI wavenumber spectra a clear development was also seen.

These indicators show that we could be close to conditions where a global confinement change is achieved.



Using LHCD as a tool to flatten the edge shear, we hope to be able to find a scenario where turbulence during controlled confinement transitions can be studied in great detail as we did in W7-AS.