Combination of 3D fields with snowflake for impurity control

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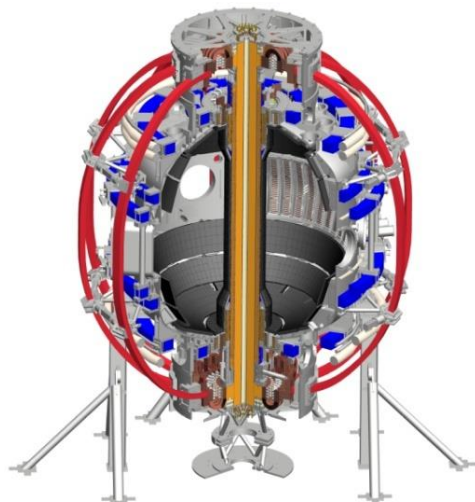
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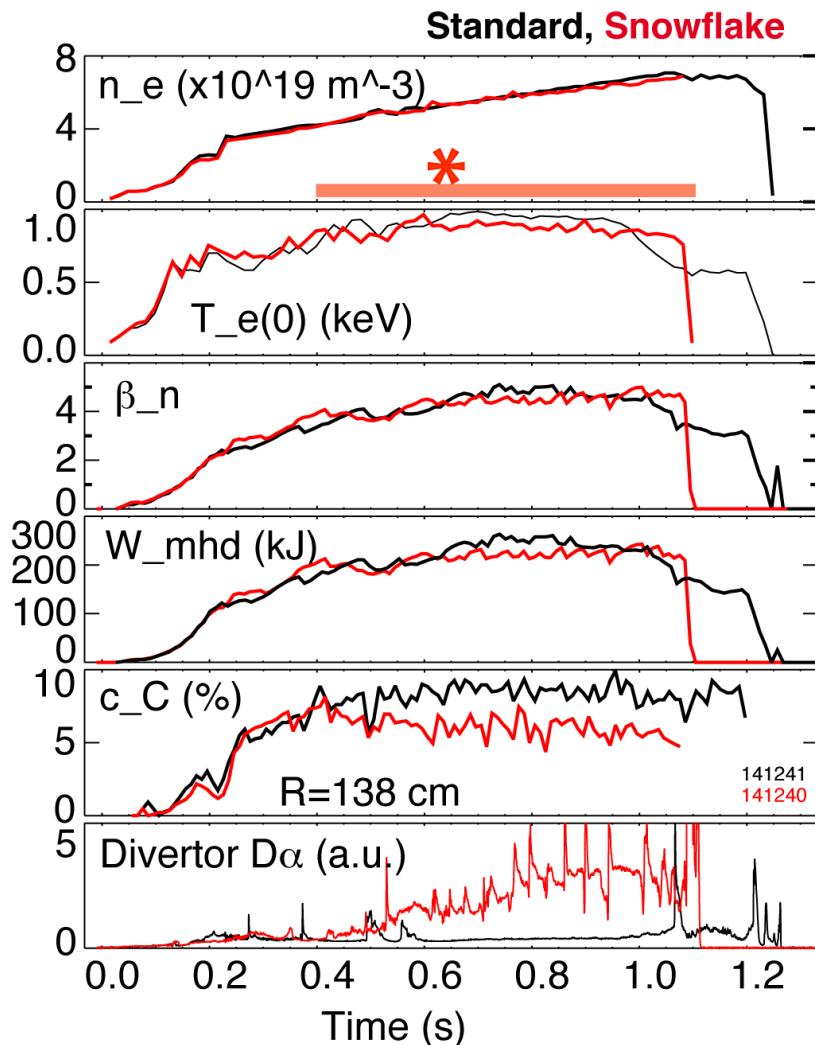# Triggered ELMs with n=3 fields and Snowflake divertor each succeeded in reducing edge impurities

Type I ELMs triggered for impurity control
(post-lithium, n=3)
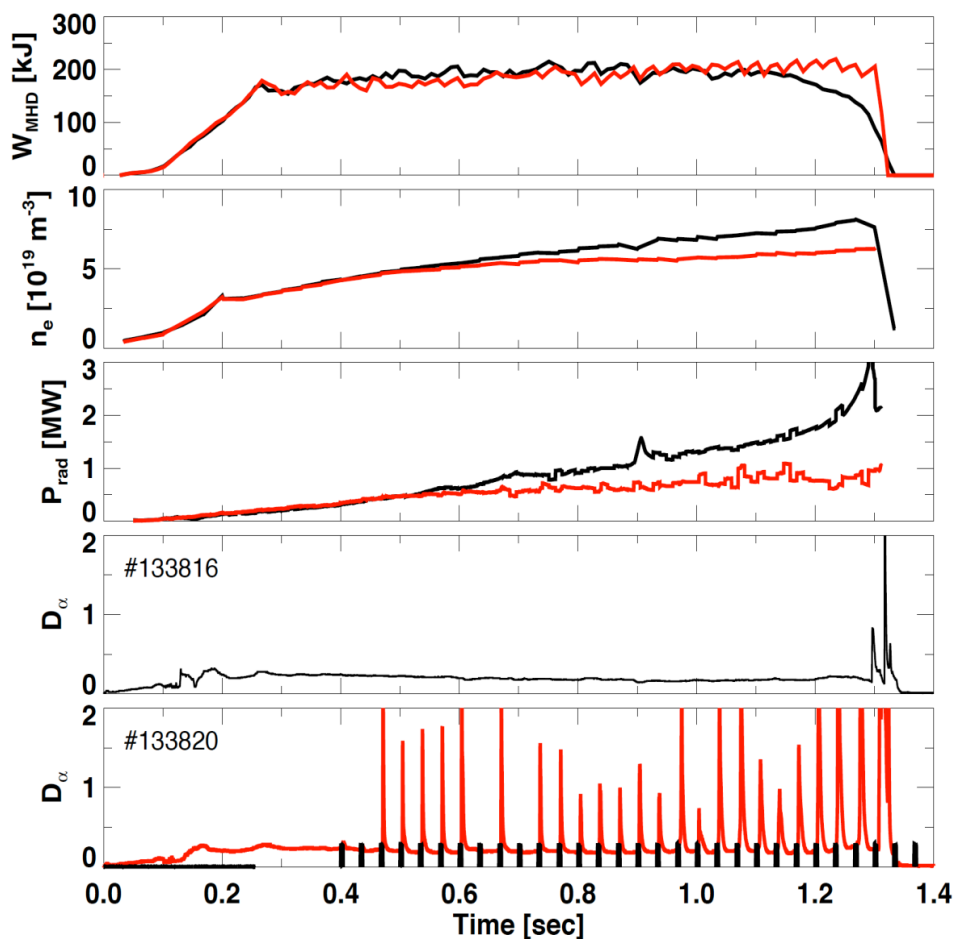
Canik, NF 2010

- Applied n=3 3-D fields have changed the rotation profiles and edge stability, including triggering ELMs
  – Also created striations on the divertor target, consistent with separatrix splitting
  – No clear signature of enhanced particle transport
  – Edge impurities are reduced when ELMs are triggered, though

Standard, Snowflake

Soukhanovskii, PoP 2012

- The snowflake configuration in FY10 was maintained for long pulses, which reduced the carbon content in the plasma
  - Due to reduced physical sputtering because of easier access to partial detachment
  - ELMs also triggered in snowflake configuration

- How to combine the two techniques, to look for possible synergies in impurity control
  - Apply 3D fields to a well established snowflake discharge

- Seek largest 3D effects onto snowflake
  - n=2 and/or n=3
  - Low q95
  - High triangularity

- Pedestal stability change expected → 3D fields to trigger ELMs or augment natural ELMs in snowflake? → enhanced particle transport or density pump-out?