



Runaway Electrons Affect ITER

Objective: Understand safe termination of fusion plasmas that undergo rapid unexpected discharges

Implications: Will help predict scenarios requiring quick tokamak shut down to avoid damaging reactor components.

Accomplishments: Simulated “runaway electron” (RE) current on ITER and two smaller tokomaks; results showed big differences in RE confinement.

- Demonstrated that magnetohydrodynamic (MHD) effects appear to transport REs out of the plasma for smaller devices; not so for ITER.
- Alternate strategies for RE mitigation and control may be needed in ITER.

- **NERSC:** NISE award in 2010 enabled this work; Franklin runs used up to 6,480 cores

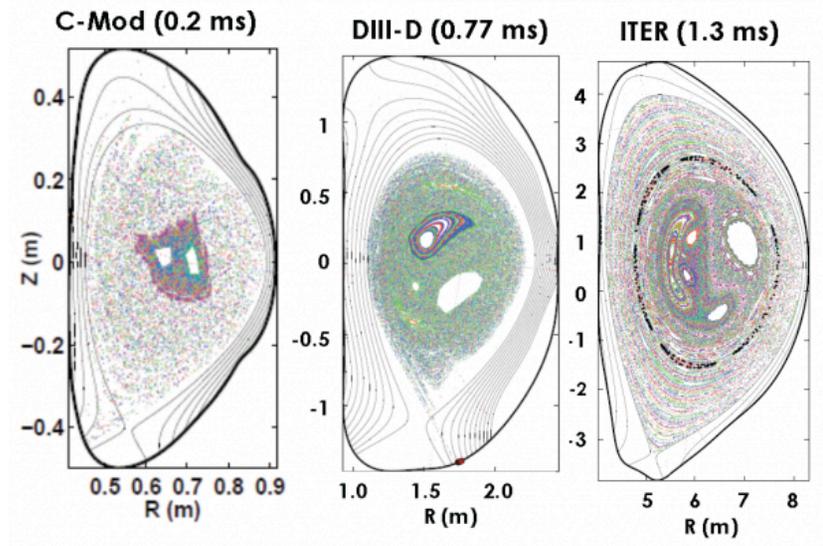


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NERSC simulation results from three tokamak devices clearly showing that runaway electron current losses due to disruption related MHD fluctuations decrease with increasing vessel size and that alternate strategies for RE mitigation/control may be needed in ITER.

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