

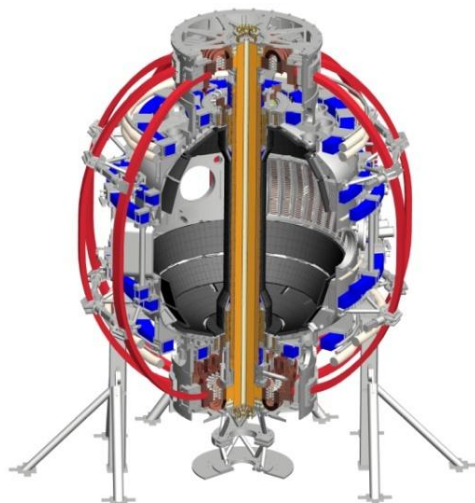
XP: HHFW CD measurements by MSE diagnostic and RF code validation

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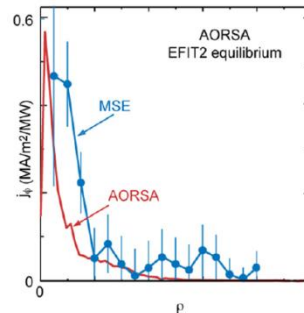
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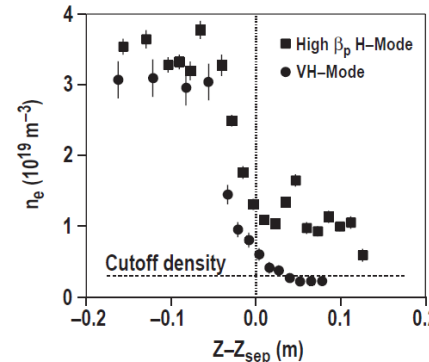
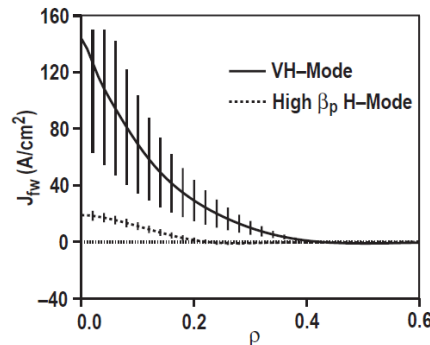
Need systematic study of HHFW CD measurement by MSE

- Validate RF codes



Phillips et al, NF 2009

- Compare heating vs. current drive regimes (different antenna phases, etc.)
- Link the HHFW absorption and the current drive measurement with the SOL density measurement (“is current drive weakest when the electron density outside the LCFS is raised above the fast wave cut-off density?”)



*Petty et al, NF 1999
on DIII-D*

- Investigate the impact of the HHFW current drive on the q profile and MHD avoidance
 - [Link to Energetic particles group](#)

Run plan for 1 day XP

- Establish scenario in L-mode plasma
 - NBI power 1-1.5 MW (NBI 1 only)
 - RF antenna phases scan: 13 m^{-1} , 8 m^{-1} , and 3 m^{-1}
 - Outer gap scan: 4 cm, 6 cm, and 8 cm
 - Magnetic field scan: 0.55 T, 0.65 T, and 0.75 T
- Extend to H-mode plasma
 - RF antenna phase and B scans
 - RF power scan: 1-4 MW
 - NBI power scan (NBI 1 only, NBI 2 only, and NBI 1+2)
- Required diagnostics: Thomson scattering, CHERS, MSE-CIF/LIF, ERD, all fast ions diagnostics
- Desired diagnostics: SOL reflectometer and IR camera