

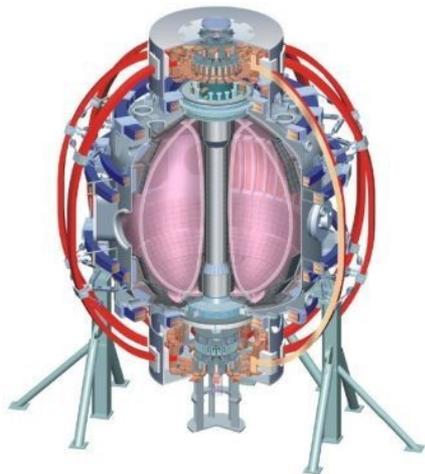
Turbulence and divertor target plasma characterization during transition to sheath- limited regime

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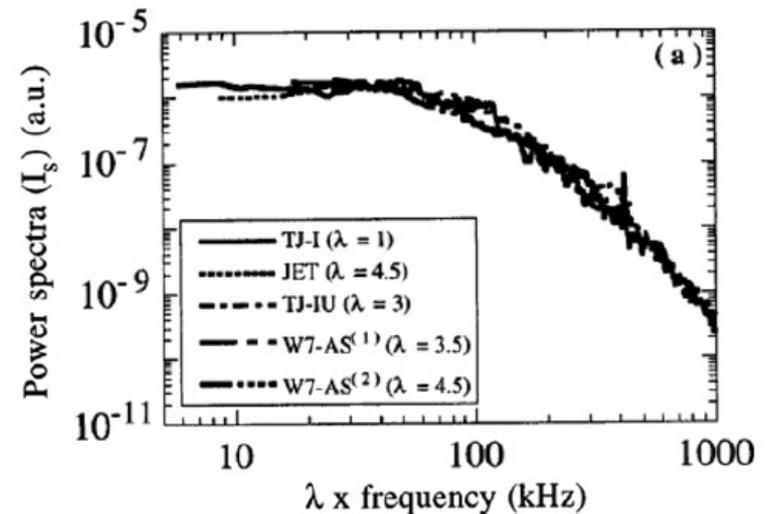
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XP goals and benefits

- Commissioning of triple probe capability for dense probe array
 - U-Illinois biasing and data acquisition
- SOL plasma parameters measured at divertor target
 - N_e , T_e , V_f by triple probes
 - Swept probes amongs TLPs to aid interpretation of triple probe signals
 - Signal digitizer Nyquist frequency at 125kHz
- Phenomenology of turbulence and blobs during transition from conduction limited to sheath-limited SOL (and back)
 - Effect on SOL density and temperature widths (DSOL-15, R10-3)
 - Effect on fluctuation magnitudes, &c.
- Correlate to effective particle lifetime if Li-TSG given run-time

Attempt to excite non-axisymmetric SOLC with gas puffing and monitor with divertor Langmuir probes

- Dense array provides high spatial resolution
 - Triple probe system provides time resolved signals up to 125kHz (n_e , T_e , V_f)
 - Swept probes used as complementary measurements and aid interpretation
 - Limited set will be configured for direct SOLC measurements
 - Initial design limited to 10 TLP, 4 swept, and 5 SOLC probes – changeable between run-days
- Temporal resolution should contain broad-band turbulence spectrum and first portion of turn-over
- Multiple measurements in the radial direction will enable k-spectrum determination



S. Zweben, et al. PPCF (2007) S1.

Run plan (Piggy-back)

- Make use of commissioning and decommissioning shots in piggyback
 - Monitor plasma conditions during Li deposition
 - Transition to sheath-limited during commissioning
 - Transition to conduction-limited during decommissioning
- Dedicated run time (NONE)
 - In general will be operating probes in the divertor
 - Probes are operated with constant bias ($V_{\text{bias}} = 48\text{V}$) in addition to the few that are swept in the usual way