**Main Objectives of TF III in OP2.1 and OP2.2**

| Main Objective | Scientific Goal | Measures of Success / Deliverables |
|---|---|---|
| ▪ Complete the core transport and stability physics basis in the extended operational space | ▪ Identify fundamental heat and particle transport mechanisms<br>▪ Continue the assessment of W7-X optimization | ▪ Documentation of relevant plasma profiles for detailed transport analysis and modelling.<br>▪ Assessment of the effects of heating and fueling actuators (profile shaping, fast ions) and magnetic configuration on turbulent transport.<br>▪ Documentation of core impurity profiles and perturbative experiments for detailed impurity transport analysis and modelling.<br>▪ Confirmation of neoclassical optimization at increased ion temperatures.<br>▪ Confirmation of reduced equilibrium currents at higher betas and different magnetic configurations.<br>▪ Documentation of MHD stability and limits and fast-particle driven MHD modes within the magnetic configuration space. |
| ▪ Complete the edge and SOL physics basis in the magnetic configuration space of W7-X | ▪ Characterization of parallel and perpendicular SOL transport regimes and validation of transport models<br>▪ Characterization of three-dimensional edge + SOL profiles and asymmetries | ▪ Providing the experimental data base for understanding transport mechanisms in the island divertor SOL and across the LCFS, including flows, drifts, turbulence<br>▪ Validation of edge transport codes<br>▪ Studies of SOL width and target heat flux scalings<br>▪ Characterization of asymmetries of plasma conditions and radiation, mapping of diagnostic results in 3D island divertor |

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|---|---|---|
| ▪ Exploitation of low-field high-beta scenarios to demonstrate W7-X optimization | ▪ Characterize MHD equilibrium and stability at high beta and beta/magnetic field effects on turbulent and neoclassical transport.<br>▪ Characterize magnetic field modification due to high beta and assess implications for edge plasma. | ▪ Assessment of W7-X MHD optimization criteria at increased plasma beta and extended magnetic configuration space.<br>▪ Documentation of high-beta plasma profiles for detailed transport analysis and modelling, w/ emphasis on magnetic fluctuation measurements.<br>▪ Assessment of the effect of field stochastization on SOL transport and operational limits due to heat flux re-distribution at high beta |