NSTX-U

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Planning initial experiments in Divertor and Scrape-Off Layer TSG on NSTX-U

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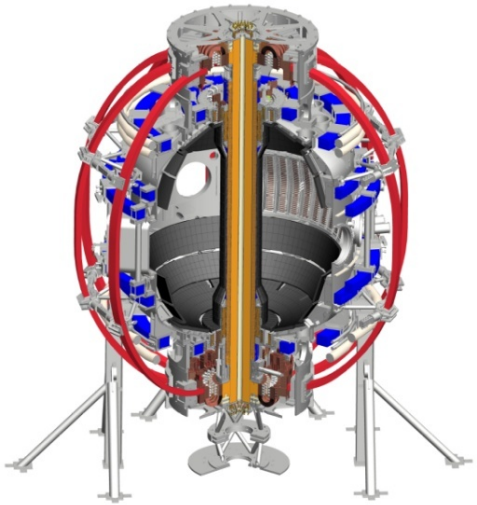

DivSOL TSG leads and/or contributes to several upcoming milestones

- **FY 2015**
  - **R(15-1)**: Assess H-mode energy confinement, pedestal, and scrape off layer characteristics with higher B_T, I_P and NBI heating power
  - **R(15-3)**: Develop the physics and operational tools for obtaining high-performance discharges
  - **IR(15-1)**: Develop and assess the snowflake divertor configuration and edge properties
- **FY 2016**
  - **R(16-1)**: Assess scaling and mitigation of steady-state and transient heat-fluxes with advanced divertor operation at high power density
  - **R(16-2)**: Assess high-Z divertor PFC performance and impact on operating scenarios

Considering initial / enabling XMPs and activities

- Diagnostic commissioning and calibrations
  - Calibrate and commission IR thermography (dedicated shots)
    - During bakeout, compare to thermocouples, evaluate surface layer effects
    - NBI power scan, I_p scan
  - Calibrate and commission neutral pressure gauges (dedicated shots)
  - Commission other SOL and divertor diagnostics (mostly piggy-back)
    - GPI, Langmuir probes, spectroscopy, cameras, bolometers, etc
- Systems commissioning and calibrations
  - Gas injectors, including divertor and SGI
- Plasma scenarios and control
  - Develop all-LFS fueling scenario
  - Develop low, medium, high triangularity shapes
  - Develop X-point and strike point control
  - Develop snowflake divertor configuration with pre-programmed coil currents, and start on feedback control algorithm

Considering initial XPs

- SOL and divertor characterization
  - Scan 1) P_{in} ; 2) I_p; 3) n_e – evaluate data trends from various diagnostics
- SOL transport / fueling
  - L-H power threshold
  - Evaluate efficiency and H-mode access of fueling scenarios
- Snowflake divertor
  - Evaluate pedestal and divertor parameters as function of inter-null distance
- Radiative divertor
  - Characterize operating space of partially detached outer strike point using D_2 injection; possibly impurity injection
    - Likely to scan NBI power, I_p, shaping, gas flow rate, etc
  - Evaluate impact of 3D fields on divertor asymmetries, SP splitting, etc