

## Select Diagnostic Upgrades and Installations

Thomson Scattering: 2D divertor expansion & fiber optics-based light collection in closed divertor geometry (UP11.00029 & UP11.00030)

Electron Cyclotron Heating Stray Wave Detector

Ion Cyclotron Emission: probe coverage expansion to measure polarity and mode number in high MHz range magnetic fluctuations

Filterscopes: improved signal to noise with optics & filters replacement

(New) Upper View Bolometers: coverage of entire upper divertor

(New) Lyman-alpha Profiles: high-field and low-field side arrays to determine neutral density profiles (NP11.00104)

Cross-polarization Scattering: in-vessel adjustable mirrors (NP11.00099)

Microwave Imaging Reflectometry: new “system-on-chip” transmitter and chip receiver modules for 2D density profiles (TP11.00153)

(New) Fast Ion D-alpha Spectroscopy: 2D imaging of fast ion population

Electron Cyclotron Emission Imaging: new system-on-chip receiver modules for 2D electron temperature profiles (UP11.00055)

(New) Imaging Neutral Particle Analyzer: phase-space sensitivity focused on trapped orbit part of distribution (NP11.00109)

(New) Infrared Calibration Heated Tile: 600 °C

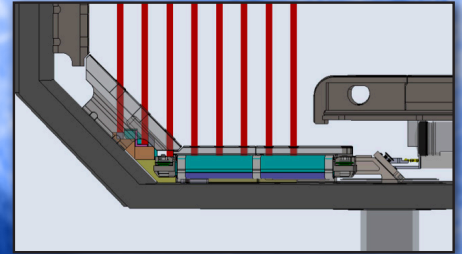
Langmuir Probes: expanded Small Angle Slot divertor coverage for detachment studies

Charge Exchange Recombination Spectroscopy: Additional high-field side toroidal views for improved measurement of poloidal asymmetry of angular rotation

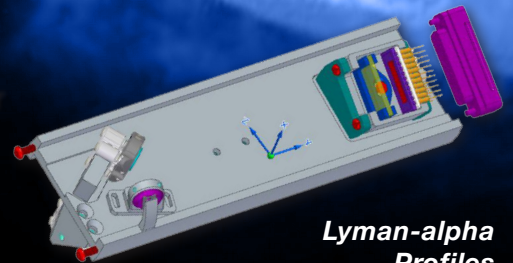
Midplane Reciprocating Probe: redesigned probe head and control system Magnetics: redesigned electronics for improved signal resolution

Surface Eroding Thermocouples: expanded Small Angle Slot divertor coverage for detachment studies (UP11.00033)

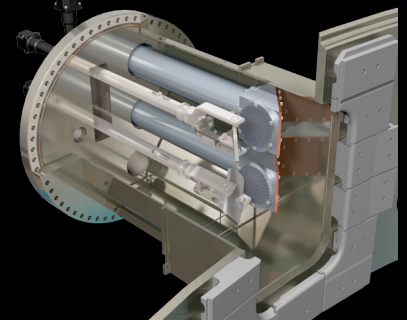
Neutron Detectors: new counter system using field-programmable gate arrays provides increased sensitivity



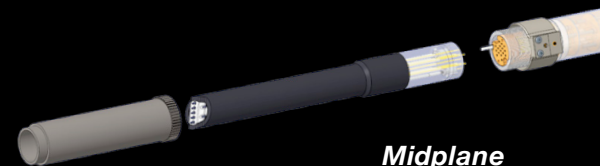
*Thomson Scattering*



*Lyman-alpha Profiles*



*Cross-polarization Scattering*



*Midplane Reciprocating Probe*



*Ion Cyclotron Emission*