

## Density profile reconstruction in the TCABR Tokamak

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A microwave reflectometry diagnostic system that operates in the frequency range between 18 GHz and 40 GHz, in the ordinary polarization mode, to cover plasma electron densities between  $0.4 \times 10^{19} \text{ m}^{-3}$  and  $2.0 \times 10^{19} \text{ m}^{-3}$ , is under re-installation in the TCABR tokamak. The minimum sweeping time is configurable up to  $8 \mu\text{s}$ , covering simultaneously the K band (from 18 GHz to 26.5 GHz) and Ka band (from 26.5 GHz to 40 GHz). The reflectometry system can operate in three different modes: sweeping mode, suitable for density profile measurements; hopping (minimum step time duration of  $150 \mu\text{s}$ ) and fixed frequency mode, suitable for MHD and turbulence studies. The output signals of the reflectometry system are digitalized in a dedicated Data Acquisition System (DAS), based on ATCA architecture with a sampling frequency up to 200 MHz. Both the reflectometer and the DAS are safely kept inside a metallic rack with electrostatic shielding and temperature monitored air-conditioning, located approximately 2 meters away from the tokamak. The angular separation between the emitter, geometrical plasma centre, and receiver horn antennas is configurable between  $4^\circ$  and  $8^\circ$ . The antennas are installed inside the vacuum vessel, in the equatorial plane, distanced 18.5 cm from the edge of the plasma column. The microwave and electronic components are electrically isolated from the vacuum vessel through a thin mica disk installed in the flanges of the emitter and receiver waveguides. The calibration procedures, the density profile reconstruction method, and the first density profiles obtained with the reflectometry diagnostic in the TCABR will be presented.