

REALISTIC REAL TIME ECE ELECTRON TEMPERATURE PROFILES MEASUREMENTS ON THE TORE SUPRA TOKAMAK

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Abstract

An upgraded 32-channel heterodyne radiometer, 1GHz spaced, is used on the Tore-Supra tokamak to measure the electron cyclotron emission (ECE) in the frequency range 78-110 GHz for the ordinary mode (O: $E\parallel B, k\perp B$) and 94-126 GHz for the extraordinary mode (X: $E\perp B, k\perp B$).

In the equatorial plane low spreading antenna and a perpendicular line-of-sight ($k\perp B$) gives ECE measurements very low refraction and Doppler effects.

From now radial resolution and precision are essentially limited by effects due to a relativistic Maxwellian electron distribution function .

Using analytical formulas, real time T_e profile processing takes routinely into account the total magnetic field, the magnetic equilibrium and the Maxwellian relativistic radial shift to improve radial location estimate in order to control the plasma.

This paper will describe the processing flow chart and some plasma control applications .