Progress on the DTT Interferometric and Polarimetric Diagnostics

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Interferometric and polarimetric diagnostics [1] are widely used in plasma experiments, particularly in magnetically confined fusion devices, to determine the electron density and to provide key information on internal magnetic fields, respectively. These measurements play a crucial role in the reconstruction of the plasma magnetic equilibrium and in the real-time estimation of the safety factor (q) profile, enabling plasma configuration control. Interferometry and polarimetry are often combined [2] into integrated diagnostic systems to allow simultaneous measurements of electron density and magnetic field.

For the Divertor Tokamak Test facility (DTT) [3], a new tokamak currently under construction in Frascati, Italy, three systems are foreseen: a tangential dispersion interferometer, a poloidal interferometer/polarimeter, and a divertor interferometer. This work focuses mainly on two of these systems: the tangential dispersion interferometer and the poloidal interferometer/polarimeter. For both systems, the work carried out to date will be briefly presented, and the latest advances in their design and modelling will be described.

References

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