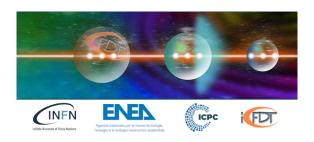
ICFDT7 - 7th International Conference on Frontier in Diagnostic Technologies



Contribution ID: 116 Type: Poster

ITER Density Interferometer Polarimeter: design update and synthetic diagnostic development

Tuesday, 22 October 2024 18:05 (1 hour)

A phase-modulated dispersion interferometer combined with a polarimeter is currently being designed in ITER. This diagnostic, called DIP (Density Interferometer Polarimeter), aims at performing reliable electron density (ne) measurements with a time resolution of 1 ms and an accuracy of 10% during ramp up/down phases, and 2% during flat-top, serving as a complementary system for ITER's main ne diagnostic, the TIP (Toroidal Interferometer/Polarimeter) [1]. ITER's DIP is based on a CO2 laser (λ = 9.6 µm). It is inherently insensitive to mechanical vibrations and, thanks to the combined polarimeter, can correct fringe jump errors [2]. Phase-modulation is performed using a photo-elastic modulator (PEM) [3].

This work presents recent updates on the system design and synthetic diagnostic development. In particular, a model that takes into account the variations of air [4] and ZnSe optical windows [5] refractive index due to environmental parameters (temperature, pressure and humidity), eventually affecting phase measurements, is here described.

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Session Classification: Poster Session B

Track Classification: Diagnostic for Density and Temperature