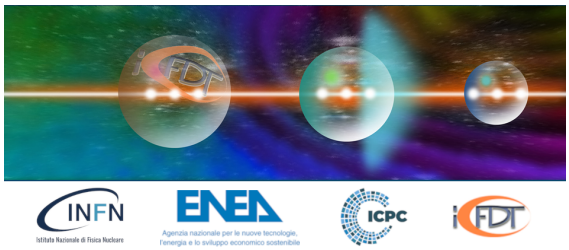

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A Near Infra-Red dispersion interferometer for ST40 and future fusion reactors

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Dispersion interferometers are gaining in popularity for the measurement of line-integrated electron density in magnetically confined (MC) plasmas. Systems have been developed for use on several MC devices around the world, mostly using a CO2 laser to produce the fundamental wavelength and frequency doubling crystals such as OPGaAs, AgGaSe2 or ZnGeP2 to generate the second harmonic. Systems working at the 10.6⊠m wavelength of the CO2 laser suffer two major disadvantages: the poor efficiency of doubling crystals at this wavelength and the presence of ro-vibrational resonances in the molecular gases present in air (O2, N2, CO2 and H2O) around the second harmonic wavelength (~5⊠m). The use of a shorter wavelength does improve the doubling efficiency; however the signal level is proportionately reduced with the wavelength. This paper discusses a dispersion interferometer using a near infra-red laser and will show results of a working system achieving high signal to noise performance.

Primary author: NAYLOR, Graham

Co-author: Dr PYRAGIUS, Tadas (Tokamak Energy)

Presenter: NAYLOR, Graham

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