JET MICHELSON INTERFEROMETER : 25 YEARS DATA SURVEY

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This article is a review of the global survey about 25 years (1985-2010) of data measured by the Michelson interferometer installed in the JET tokamak [1,2]. Electron temperatures profiles are provided by Thomson scattering and ECE systems (interferometers, radiometers), and all the ECE systems installed in JET are calibrated against the Michelson interferometer : its spectral sensitivity, determined by absolute calibration [3] is then of first importance and will impact the whole ECE system installed on JET.

The Michelson interferometer has been proved extremely reliable over the years and that system should be installed on ITER. Key points raised by the Review of the ITER ECE System [4] are addressed, like long-time stability of measurements and calibrations.

Trends and evolutions over the time could appear, affecting its spectral sensitivity : we show a systematic survey based on measurements done in the lab, then compare with the temperature profiles measured by the Thomson scattering systems.

The calibrations performed in the laboratory proved to be constant over the years, showing a +/- 5% variation, showing that both the 600° microwave source and the Michelson itself have been reliable over these years. Results from the JET in-vessel calibrations performed in 1997, 2007 and 2010 will be compared and discussed. Temperature measurements have been compared with the ones given by Thomson scattering (LIDAR diagnostic). No obvious trends is visible over the relatively high scattering of the tempeatures ratio (+/- 20%)

- [1] A. E. Costley et al, IEEE International Conference on Infrared and Millimeter Waves, Miami (1983).
- [2] E. A. M. Baker et al, 5th Joint Workshop on ECE and ECRH, San Diego (1985).
- [3] E. A. M. Baker et al, 4th Joint Workshop on ECE and ECRH, San Diego (1984).
- [4] M. E. Austin, Review of ITER ECE System, Final report (2007)

See the Appendix of F. Romanelli et al., Proceedings of the 22nd IAEA Fusion Energy Conference 2008, Geneva, Switzerland