A Study of Core Thomson Scattering Measurements in ITER Using a Multi-Laser Approach

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(i) The problem:

to measure $T_e$ as high as 40 keV using Thomson Scattering in the reactor core both for Maxwellian and non-Maxwellian case of electron velocity distribution function especially in the case of unknown system spectral responsivity.

(ii) The suggested solutions:

to use IR probing laser 1320 nm additionally to convenient NIR laser 1064 nm to improve measurement accuracy for $T_e \sim 40$keV;

to use specific algorithm for TS data processing in case of non-Maxwellian eVDF;

to use multi-laser approach, that suggests plasma probing with 3 lasers – 946 nm/1064 nm/1320 nm simultaneously in the case of unknown system spectral sensitivity.

(iii) Next steps – test multi-laser approach and designed data procession technique in real experiment on existing fusion device.