status of Thomson Scattering in ITER divertor

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Monitoring of the divertor plasma electron parameters will be an important part of ITER experimental program. Te and ne are required to study divertor plasma, to control the load on divertor plates, and to control position of strike-point ‑ intersection of separatrix with divertor plates. The given work concentrates on Thomson scattering diagnostics developed for ITER divertor. ITER divertor Thomson scattering (TS) diagnostics will operate in extremely hard conditions: high radiation loads on optical elements, contamination of optical elements by erosion products of the first wall as dust and film depositions. Diagnostics implementation is complicated by limited access to plasma and the TS signal low intensity, often weaker than plasma background radiation, including linear and continuous radiation spectra, as well as radiation of heated elements of the divertor targets. The main problem of divertor TS development is limited access to plasma and good performance with a long lifetime of optical components located close to divertor plasma characterized by high density of the first wall erosion products.

Currently, diagnostics is at the beginning of stage ended by final design review (FDR). The preliminary project review (PDR) was held in the summer of 2017. The responses on the most critical chits formulated in the PDR were approved by ITER organization (IO) at the end of 2018. An overview of the most critical issues of TS diagnostics in ITER Tokamak divertor is considered.

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