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# STATUS OF THE TANGENTIAL THOMSON SCATTERING SYSTEM ON THE T-15MD TOKAMAK *)

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The tangential Thomson scattering diagnostics on the T-15MD tokamak have begun operation and demonstrated their functionality during the 2023–2024 winter experimental campaign [1]. The system is based on a Nd:YAG laser operating at the first harmonic (λ = 1064 nm) and polychromators with interference filters and avalanche photodiodes. Based on the results of the first campaign, a decision was made to redistribute the spatial channels, which, together with general progress in plasma control, made it possible to perform spatially uniform measurements of the full electron temperature and density profiles from the inner to the outer periphery of the plasma at the main stage of discharge during the fall 2024 campaign. The operating of the diagnostic system in pulses longer than 2 seconds has been demonstrated. Measurable by the system plasma density and temperature in the longest discharge #3030 was observed for ~2260 ms. It was demonstrated that in discharges with plasma current of up to 500 kA and EC heating power of 1 MW, the electron temperature of Te ~ 1.5 keV was reached at a density of ne ~ 2.5·1019 m-3 in the quasi-stationary stage of the discharge. The measured electron temperature values are in good agreement with the results of the soft X-ray spectrometer.

The polychromators used for registration have separate ADCs for measuring the slowly varying background plasma radiation. The data of the slow channels allowed to estimate from above (without taking into account the contribution of the linear plasma spectrum) the average value of the effective plasma charge, Zeff. The first – the narrowest (λ = 1055..1060 nm) – spectral channel of the polychromator, which makes measurements near the plasma axis, was used for the estimations. This spatial channel is chosen because focusing at the center of the vacuum chamber provides a minimal light collection area at the periphery of the plasma. The estimation demonstrated that Zeff < 2.5 was achieved at the quasi-stationary stage of discharge at a central plasma density of ne ~ 2,5·1019 m-3.

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## References

[1]. Asadulin G.M. et al. // Plasma Physics Reports, 2024, Vol. 50, No. 11, pp. 1327–1336.

*) abstracts of this report in Russian