## DOI: 10.34854/ICPAF.52.2025.1.1.229

## THE FIRST RESULTS OF CXRS MEASUREMENTS ON EAST WITH THE USE OF ITER-LIKE MULTICHANNEL HES SPECTROMETER \*)

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The Charge eXchange Recombination Spectroscopy (CXRS) diagnostic [1] is widely used on modern tokamaks for plasma parameters measurement. The diagnostic allows to measure plasma parameters via analysis of the emission spectrum that appears when high-energy atomic beam is injected into the plasma. Fully ionized light impurities of plasma undergo charge exchange reaction with beam atoms, which leads to emergence of the active charge exchange spectral line. The line could be fitted with a Gauss function, then by its width, shift and intensity the plasma ion temperature, rotation velocity and concentration of the emitting ion respectively could be evaluated. Moreover, these measurements are local, because the active charge exchange emission is collected from the small plasma volume of the beam and line of sight intersection.

For CXRS on ITER a multichannel High Etendue Spectrometer (HES) [2] was developed. It allows to carry out measurements in several spectral ranges simultaneously and has high resolution. In the end of 2023 the two-channel HES with "green" channel that has spectral range 523 - 530 nm with C VI (8 – 7, 529.1 nm) spectral line and with "red" channel that has spectral range 652 - 661 nm with H-alpha (3 – 2, 656.3 nm) spectral line was sent to EAST tokamak, where it was used for active spectroscopy measurements on heating beam for two observation points with minor radiuses r = 0.16a and r = 0.55a.

In this work the results of spectra processing that were obtained for EAST discharges with HES are described. For its analysis two different methods were applied: subtraction of passive frames (when beam is off) from active frames (when beam is on) for acquisition of the active charge exchange spectral line and fitting of active and passive spectral lines from the spectra with set of the Gauss functions in CXSFIT code [3]. Evaluated plasma ion temperatures are in good agreement with ion temperature values measured with X-ray Calorimeter Spectrometer (XCS) diagnostic.

This work was carried out in accordance with the state contract dated 20.03.2024  $N_{\odot}$  H.4a.241.19.24.1024.

## References

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<sup>\*)</sup> abstracts of this report in Russian