

The GOLEM tokamak bibliography

The tokamak GOLEM team

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1 GOLEM Articles

References

Dimitrova et al.: Plasma properties in the vicinity of the last closed flux surface in hydrogen and helium fusion plasma discharges **Dimitrova-2024-PPCF**

M Dimitrova et al. “Plasma properties in the vicinity of the last closed flux surface in hydrogen and helium fusion plasma discharges”. In: *Plasma Physics and Controlled Fusion* 66.7 (2024), p. 075022. DOI: 10.1088/1361-6587/ad5377. URL: <https://dx.doi.org/10.1088/1361-6587/ad5377>.

Abstract: The origin of the bi-Maxwellian electron energy distribution function (EEDF) observed in the scrape-off layer (SOL) of tokamak plasmas by means of Langmuir probes is still under discussion. It has been assumed that the ionization of hydrogen and deuterium neutrals by thermal electrons penetrating the SOL from the bulk plasma is the main reason for the appearance of a second Maxwellian. To validate this assumption, radial measurements of the electron temperatures and densities, or the plasma properties in helium plasmas in the GOLEM tokamak and the TJ-II stellarator were performed. The radial profiles of the low-temperature electron group densities follow the trend of the calculated radial profiles of the electron sources arising from the ionization of neutrals in both deuterium and helium plasmas in TJ-II. The difference in the radial location where the bi-Maxwellian EEDF appears can be explained by the difference in the rate coefficients for ionization of deuterium and helium. The results of probe measurements in GOLEM and the WEST tokamak divertor, at one radial location in the SOL, are compatible with the hypothesis concerning the ionization of neutral atoms and the type of the EEDF.

2 CASTOR articles

References

Stöckel et al.: Advanced probes for edge plasma diagnostics on the CASTOR tokamak **Stockel-2024-JPCS**

J Stöckel et al. “Advanced probes for edge plasma diagnostics on the CASTOR tokamak”. In: *Journal of Physics: Conference Series* 63.1 (2007), p. 012001. DOI: 10.1088/1742-6596/63/1/012001. URL: <https://dx.doi.org/10.1088/1742-6596/63/1/012001>.

Abstract: Understanding of underlying physics in the edge plasma of tokamaks requires knowledge of the plasma density, potential, electron and ion temperature, ion flows and their fluctuations with a high spatial and temporal resolution. A family of electric probes, which have been designed and tested for this purpose in the CASTOR tokamak, is reviewed and examples of their performance are given. In particular, we focus on description of the 1D and 2D arrays of Langmuir probes for spatially resolved measurements of the edge turbulence, the Ball pen and emissive probes for direct measurements of the plasma potential, the optimized Gundestrup probe for measurements of parallel and perpendicular ion flow, and the tunnel probe for fast measurement of electron and ion temperatures. Additional information on individual diagnostics is available in the listed references. PACS 52.70.Ds.