Kratek opis vsebine:

Abstract. The first-derivative probe technique was applied to derive data for plasma parameters from the *IV* Langmuir probe characteristics measured in the plasma boundary region in the COMPASS tokamak and in the TJ-II stellarator. It is shown that in the COMPASS tokamak in the vicinity of the Last Closed Flux Surface (LCFS) the Electron Energy Distribution Function (EEDF) is bi-Maxwellian with the low-temperature electron fraction predominating over the higher temperature one, whereas in the far scrape off layer (SOL) the EEDF is Maxwellian. In the TJ-II stellarator during NBI heated plasma the EEDF in the confined plasma and close to the LCFS is bi-Maxwellian while in the far SOL the EEDF is Maxwellian. In contrast, during the ECR heating phase of the discharge both in the confined plasma and in the SOL the EEDF is bi-Maxwellian. The mechanism for the appearance of a bi-Maxwellian EEDF in the vicinity of the LCFS is discussed. The comparison of the results from probe measurements with ASTRA package and EIRENE code calculations suggests that the main reason of the appearance of a bi-Maxwellian EEDF in the vicinity of the LCFS is the ionization of the neutral atoms. Results for the electron temperatures and densities obtained by the first-derivative probe technique in the COMPASS tokamak and in the TJ-II stellarator were used to evaluate the radial distribution of the parallel power flux density. It is shown that in the vicinity of the LCFS where the EEDF is bi-Maxwellian, the radial distribution of the parallel power flux density is double exponential. It is pointed that in calculations of the parallel power flux density at the LCFS the energy losses from ionization mechanisms have to be taken into account.

prof. dr. Tsviatko K. Popov
Faculty of Physics
St. Kliment Ohridski University of Sofia
1164 Sofia, BULGARIA