**Plasma properties in the vicinity of last closed flux surface of deuterium and helium discharges in THE TOKAMAK GOLEM AND**

**TJ-II stellarator**

Tsv K Popov1,3, M Dimitrova2,3 , D López-Bruna4, M A Pedrosa4, C Hidalgo4,

J Stöckel5,2, V Svoboda5, J. Kovačič6, T Gyergyek6,7

1 NIS at St. Kliment Ohridski University of Sofia, 5, J. Bourchier blvd., 1164 Sofia, Bulgaria

2 Institute of Plasma Physics, Academy of Sciences of the Czech Republic v.v.i.,

Za Slovankou 3, 182 00 Prague 8, CR

3 Emil Djakov Institute of Electronics, Bulgarian Academy of Sciences,

72, Tsarigradsko Chaussee blvd., 1784 Sofia, Bulgaria

4 Laboratorio Nacional Fusión, CIEMAT, Complutense 40 – 28040 Madrid, Spain

5 Faculty of Nuclear Sciences and Physical Engineering CTU Prague, CZ-11519, CR

6 Jožef Stefan Institute, 39, Jamova, 1000 Ljubljana, Slovenia

7 University of Ljubljana, Faculty of Electrical Engineering, Tržaška 25,

1000 Ljubljana, Slovenia

The assumption of a Maxwellian electron energy distribution function (EEDF) in fusion plasmas is generally valid. However, there is theoretical predictions [1-3] and experimental evidences [4] suggesting in some cases non-Maxwellian distributions of the electrons in the vicinity of the last closed flux surface (LCFS) in fusion devises, namely, together with thermal electrons with energy in the range 10-30 eV there is low temperature electron group with energy 5-7 eV. It was shown that in series of experiments for radial measurements of electron temperatures and densities in hydrogen and deuterium plasmas in different tokamaks, CASTOR, COMPASS, and ISSTOK as well in TJ-II stellarator that this non-Maxwellian EEDF can be approximated with sum of two Maxwellian distributions, i.e. bi-Maxwellian EEDF.

The origin of the bi-Maxwellian EEDF is still under discussion. In our previous works [4] is considered that the ionization of hydrogen and deuterium neutrals by thermal electrons penetrating from the bulk plasma into the SOL is the main reason for deviation of the EEDF from a Maxwellian. To validate this assumption, radial measurements of electron temperatures and densities in helium plasmas in the tokamak GOLEM and TJ-II stellarator were performed. The radial profiles of densities of low temperature electron group were compared with radial profiles of electron source due to the ionizations of neutrals calculated by EIRENE code for both deuterium and helium plasmas in TJ-II and was find satisfactory agreement in both cases. The differences in the positions of appearing of bi-Maxwellian EEDF were explained by differences in the rate coefficients for ionization of deuterium and helium [5].

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