

ON DETECTING HOT ELECTRON POPULATION IN THE COMPASS TOKAMAK DIVERTOR

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In this work we describe an attempt to confirm experimentally the presence of non-Maxwellian electron population in the divertor plasma of the COMPASS tokamak [1]. A recent theoretical study indicated that low-temperature divertor plasmas contain at least two populations of electrons: the first one being thermalized, the second, a hot electron one originating from the upstream SOL [2]. It has also been demonstrated that in the next generation of tokamaks the hot electron population might represent the main power carrier to the divertor plates; therefore, experimental confirmation of the presence of these hot electrons is of utmost importance.

There exist a number of indirect measurements of the hot electron population, but so far no solid confirmation has been achieved [2]. In this study, we applied a fast probe-biasing technique (with switching time $< 1 \mu\text{s}$). The measurements were performed in COMPASS H-mode discharges with high-density cold inner divertor plasma. In order to explain the experimental results, high-resolution full kinetic modelling was conducted.

Acknowledgments: This research has been partially supported by the Joint Research Project between the Bulgarian and Czech Academies of Sciences, BAS – 20-13, by the Czech Science Foundation grant No. 20-28161S and IAEA CRP F13019 - Research Contracts No 22727.

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