

Design and Development of Probe for the Measurements of Runaway Electrons Inside the GOLEM Tokamak Plasma Edge

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Repeatable discharges with high loop voltage and low-density in GOLEM tokamak [1] present good experimental conditions for the study of runaway electrons (RE). A probe is being designed and developed for the spectral measurement [2] of RE energy inside and near the GOLEM tokamak plasma edge. Probe design is based on simulation results of FLUKA code [3] that estimates the energy absorbed by the filters of high-density materials and scintillating crystals. Simulations performed for the electron beams of energy 1-10MeV suggest that runaways may have energy much higher than 1MeV in the GOLEM tokamak. In the simulations, graphite, stainless steel, molybdenum and tungsten were tested to filter the supra-thermal electrons. Since having low-Z and being sensitive to γ -radiations and electrons, YSO ($Y_2SiO_5:Ce$) [2] scintillation crystal is chosen for the probe. However, flexible design of the probe allows different scintillating crystal and filter materials inside it. In the conference, design, development and preliminary results of the RE measurements by the probe will be presented.

References

[1] V. Svoboda, et al., Fusion Engineering and Design, 86(6-8):1310–1314, 2011

[2] T. Kudiyakov et al., Review of Scientific Instruments **79**, 10F126 (2008)

[3] A. Ferrari, et al. FLUKA: A multi-particle transport code (Program version 2005). No. INFN-TC-05-11, 2005.