Contribution ID: **143** Type: **Poster**

Runaway Electron Diagnostics Using Silicon Strip Detector

Wednesday 10 July 2019 16:33 (2 minutes)

We present an application of the PH32 strip radiation detector [1] for a study of runaway electrons [2] in the GOLEM tokamak at the FNSPE CTU in Prague [3]. GOLEM has a chamber 0.8 m in diameter and operates in the magnetic field $B_t < 0.5$ T and the discharge duration is $t \approx 13$ ms. The detector used for diagnostics is composed of the PH32 silicon readout chip and a high-resistivity silicon strip sensor. It was primarily designed for measurement of X-rays, electrons and charged ions including alpha particles.

The main goal of this measurement is to study the spatial and temporal distribution of the runaway electrons directly and compare the results to the indirectly obtained results from already existing diagnostic method implementing an HXR scintillator. The strip detector was placed in vacuum inside the tokamak vacuum chamber on swivel head in order to directly detect the generated runaway electrons in all directions with respect to the direction of plasma. The performed experiment illustrates the development of a new plasma diagnostic method and acquired results are promising.

[1] Z. Janoska et al. Measurement of ionizing particles by the ph32 chip. In 2015 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), pages 1–5, Oct 2015. doi: 10.1109/NSSMIC.2015.7581968.
[2] H. Knoepfel and D.A. Spong. Runaway electrons in toroidal discharges. Nuclear Fusion, 19(6):785–829, jun 1979. doi: 10.1088/0029-5515/19/6/008.
[3] O. Grover et al. Remote operation of the golem tokamak for fusion education. Fusion Engineering and Design, 112:1038 –1044, 2016. ISSN 0920-3796. doi: https://doi.org/10.1016/j.fusengdes.2016.05.009.

Author: NOVOTNY, Lukas (Czech Technical University (CZ))

Co-authors: BREN, David (FNSPE, Czech Technical University in Prague); CEROVSKY, Jaroslav (FNSPE, Czech Technical University in Prague); DHYANI, Pravesh (FNSPE, Czech Technical University in Prague); FARNIK, Michal (FNSPE, Czech Technical University in Prague); FICKER, Ondrej (FNSPE, Czech Technical University in Prague); HAVRANEK, Miroslav (FNSPE, Czech Technical University in Prague); HEJTMANEK, Martin (FNSPE, Czech Technical University in Prague); JANOSKA, Zdenko (FNSPE, Czech Technical University in Prague); KAFKA, Vladimir (FNSPE, Czech Technical University in Prague); KULKOV, Sergei (FNSPE, Czech Technical University in Prague); LINHART, Vladimir (FNSPE, Czech Technical University in Prague); MARCISOVSKA, Maria (FNSPE, Czech Technical University in Prague); MARCISOVSKY, Michal (FNSPE, Czech Technical University in Prague); MLYNAR, Jan (FNSPE, Czech Technical University in Prague); NEUE, Gordon (FNSPE, Czech Technical University in Prague); SVIHRA, Peter (FNSPE, Czech Technical University in Prague); SVOBODA, Vojtech (FNSPE, Czech Technical University in Prague); TOMASEK, Lukas (FNSPE, Czech Technical University in Prague); TUNKL, Marek (FNSPE, Czech Technical University in Prague); VRBA, Vaclav (FNSPE, Czech Technical University in Prague)

Presenter: NOVOTNY, Lukas (Czech Technical University (CZ))

Session Classification: Poster Exhibition 2, Posters ID 81 - 182, chair: Christer Frojdh

Track Classification: general