

Plasma Materials Interactions & Diagnostics Symposium



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Cherenkov detectors as an auxiliary diagnostic for the studies of the runaway-electrons beams recorded in the tokamak's Scrape-Of-Layer

The NCBJ team had proposed to use Cherenkov detectors with diamond radiators for measurements of fast electrons inside the Magnetic Confinement Facilities of the tokamak type many years ago. The main idea was the application of a Cherenkov Effect for measurements of electron-beams in the energy range of (50-300) keV. In MCF the studies were performed for runaway electrons that undergo acceleration up to relativistic energies, which can pose a threat to high energy plasma facilities and experiments.

The use of diamond crystals was dictated by its high refractive index and high thermal conductivity, which allowed to record Runaway Electrons with energies above 51 keV and, simultaneously, helped to keep radiators' temperatures sufficiently low.

The most interesting measurements of the fast runaway electrons by means of the presented detectors have been performed in the COMPASS, FTU and TCV tokamaks within their scrape-of-layers, but also a little bit behind the Last Closed Flux Surfaces. This presentation summarizes the most important results of fast electrons measurements performed in different tokamaks by means by the reported diagnostic

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