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Determination of Runaway Electron Distribution Parameters from Synchrotron Radiation Measurements

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Runaway electrons (RE) in a tokamak can deposit a significant quantity of energy onto the plasma facing components and therefore represent a threat to ITER and next step fusion devices. This contribution presents the Runaway Electron Imaging Spectroscopy (REIS) diagnostic, designed to collect spectra and images produced by the RE synchrotron radiation emission. The system is composed of spectrometers covering the range from 0.4 μm up to 5 μm and a fast CCD camera. We show how the RE energy, pitch angle, radial density profile and total number can be inferred through the comparison of REIS experimental images and spectra with simulations. Results of the application of this method to the study of the RE dynamics in FTU discharges will be discussed.

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