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Determination of Radiated Power Density Profile Using Bolometer Data for DT Baseline Scenario at JET

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The experimental data obtained from the campaign dedicated to Baseline scenario for DT (deuterium-tritium) at Joint European Torus (JET) is being investigated in the frame of EUROfusion's programme. The development of reliable ˜4.0 MA scenario at q95 ˜ 2.7-3 compatible with DT operation and pulse length of 5s together with the optimization of the scenario for high performance at 4.0 MA to achieve Pfus = 15MW in DT are the main experimental goals for the study related to "Baseline scenario for DT"at JET. For this purpose, data analysis of the experiments of the DT campaign needs the bolometric measurements of the energy losses with electromagnetic radiation and neutral particles, which is the essential diagnostic tool for hot plasmas.
At JET, where the plasma has a complex shape, the measurement of the spatial distribution of radiation losses employs several multichannel bolometric arrays with different directions of sight (horizontal and vertical) installed in a poloidal cross-section. Moreover, additional channels are used for obtaining the radiation loss distribution in the region of the divertor for radiative experiments. Tomography is used for reconstruction from the set of line-of-sight integrated measurements of brightness (in W·m–2) to the local emissivity (in W·m–3) profiles.
As the result of the data analysis, the radiated power in tokamaks are provided by JET bolometer tomography reconstruction. In addition, energy balance as well as reliance on discharge and the time evolution of radiation loss profiles are delivered for investigation of the plasma and impurity transport in baseline scenario for DT.

Primary author: STANKUNAS, Gediminas (Lithuanian Energy Institute)

Presenter: STANKUNAS, Gediminas (Lithuanian Energy Institute)

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