Contribution ID: **1** Type: **Invited Oral**

Assessment of the gas detector-based SXR diagnostics performance as a plasma radiation device at WEST

Monday 1 September 2025 10:00 (30 minutes)

The proposed contribution concerns the development of gas detectors for use in the future reactors. Measurement of soft X-ray (SXR) radiation of magnetic plasmas is a standard method of obtaining valuable information on particle transport and magnetic configuration. Recent consideration of a gas detector for future fusion reactors extends its potential use as part of the plasma control structure, which places a significant burden on the development of such a system for such a demanding application. The development of the photon conversion and signal processing components of the proposed monitoring system necessitates the consideration of numerous physical, technical and technological aspects during the design and manufacturing stages.
The contribution will present the advances of development of a Gas Electron Multiplier (GEM)-based SXR detection system at its exploitation results obtained at WEST tokamak. The examination of the plasma radiation emission patterns across the WEST experimental campaigns, utilizing a GEM detector, will also be presented. The presentation will also include a comparison and correspondence of the obtained results from the last campaigns at WEST with the GEM detector to the related plasma data, as well as the results of the plasma radiation simulations towards the commissioning of the diagnostics. The simulations of plasma radiationfor WEST discharges will be based on the coronal equilibrium model, whilst GEANT4 will be utilized for simulations of the plasma radiation interaction with the detector materials. These numerical results will then be compared with the experimental data that has been taken.
The presentation will provide an overview of the status and outcomes of the research and development phase, in conjunction with the experimental findings derived from the campaigns at WEST tokamak.

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