

Detector Characterization Plan for 55.B3 Microfission Chamber

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The in-vessel neutron flux monitor equipped with 55.B3 Microfission Chambers (MFCs) is procured by Japan Domestic Agency (JADA). For neutron diagnostic systems, 10% of measurement accuracy is required. In order to achieve that, a clear calibration strategy needs to be developed, from evaluation of the detector itself to in-situ calibration in the Tokamak.

The characterisation of the MFC detectors is one of the important calibration activities to determine their response in the neutron energy range that this diagnostic is expected to measure. The characterisation required in the essential part of the procurement is needed to make sure that the diagnostic can meet the measurement requirement once it is installed in ITER tokamak.

In JADA, as part of the characterization plan, the linearity of the neutron measurement signal of the MFC detector has already been checked and the influence of the magnetic field has already been evaluated by installing the MFC detector in JT-60U. In addition, we are planning to evaluate the influence of the directivity of the neutron flux and the sensitivity to neutron fluxes of different energies in order to proceed manufacturing the MFC detectors and their delivery to ITER.

In this talk, the detail characterisation plan and procedure of the MFC detectors to be performed by JADA before the delivery of the system to ITER Site are presented. Further, suggestions or requirements in the In-Situ Calibration in the ITER Tokamak are also presented in order to obtain the accurate calibration coefficient of the MFC detectors.