

JA fusion neutronics activities toward JA-DEMO design and construction

Thursday 12 June 2025 09:55 (40 minutes)

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Toward the development of JA-DEMO reactors and their neutron engineering are being conducted in Japan. In this talk, we will review the nuclear analysis of the ITER TBM, the current status of the nuclear analysis and design activities of neutron sources for material irradiation, and the progress of nuclear data evaluation, which is essential for fusion, as research activities related to fusion neutron engineering being conducted in Japan.

In JA-DEMO blanket design in Japan, the Quantum Science and Technology Agency (QST) and other organizations are studying the water-cooled ceramic breeding blanket (WCCB) type design as a major candidate, and are conducting analyses mainly on the evaluation of tritium production rate with the ITER reactor configuration in mind.

Irradiation evaluation of structural materials is an important technical study item in DEMO reactor design, and irradiation tests using a strong neutron source such as IFMIF are important for this purpose. The irradiation test analysis of these materials by the D-Li neutron source has been in progress.

Moreover, we performed a few benchmark tests not only for neutron induced nuclear data libraries, TENDL, FENDL and JENDL, but also charged particles induced ones of important nuclides such as iron, copper, concrete and beryllium to improve accuracies for fusion relevant neutronics analyses.

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Session Classification: Neutronics