Karlsruher Institut für Technologie

KIT | INR | Hermann-von-Helmholtzplatz 1
76344 Eggenstein-Leopoldshafen

Aushang

Institut für Neutronenphysik und Reaktortechnik

Komm. Institutsleitung:
Prof. Dr.-Ing. John Jelonnek

Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen

Telefon: 0721-608-22552
Fax: 0721-608-23718
E-Mail: ingeborg.schwartz@kit.edu
Web: www.inr.kit.edu

Bearbeiter/in: Ingeborg Schwartz
Unser Zeichen: ISC
Datum: 02.07.2025

Einladung zum Seminar über „Nukleare Energieerzeugung“

Zeit: **Montag, 7. Juli 2025, 11:00 Uhr**

Ort: Karlsruher Institut für Technologie, Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen, INR, Bau 521, Raum 302

Referent: **Herr Dr. Roman Afanasenko**, Karlsruher Institut für Technologie, INR

Titel: Evaluation of the shutdown dose rates for the fusion facilities

Abstract:

To ensure a robust DEMO fusion reactor design it is required to address complex and challenging safety, licensing and regulatory issues. As part of related tasks, neutronics and activation analyses are performed. Results of activation analyses of irradiated materials and shutdown dose rates (SDDR) inside the tokamak are components of the database that is used for safety assessments of the DEMO project. Because DEMO is a nuclear facility, the reactor systems and the accessible space inside the plant are subjected to intensive nuclear irradiation both from neutrons and gammas. This work is concentrated on assessments of the SDDR inside the vacuum vessel of the DEMO reactor at the start of its operation to define a time at which the dose rate becomes unsuitable for personnel access and a duration of the irradiation exposure that ensures an acceptable dose uptake by workers. The study includes an assessment of SDDR, using the R2Smesh (mesh-based Rigorous Two Step) tool, developed at KIT. To this end, MCNP particle transport simulations are performed to assess 3D-mesh distributions of the neutron flux superimposed over the DEMO geometry inside the vacuum vessel. Subsequent activation calculations with FISPACT-II code and decay gamma transport simulations provide a map of the SDDR within the vacuum chamber. A series of SDDR calculations are performed for different DEMO irradiation scenarios to obtain dose rates inside the vacuum vessel satisfying the safety requirements for personnel access. Based on the results produced recommendations will be summarized to outline the radiation environment relevant to the definition of a strategy for the DEMO maintenance at the beginning of its nuclear operation.

Hinweis: Alle auswärtigen Besucher des Seminars werden gebeten, ihren gültigen Personalausweis oder Reisepass mitzubringen