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Aushang

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Einladung zum Seminar über „Nukleare Energieerzeugung“

Zeit: **Montag, 21. 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. Axel Klix**, Karlsruher Institut für Technologie, INR

Titel: Fusion neutronics experiments utilizing the intense DT neutron generator of Technical University of Dresden

Abstract:

In the early 2000s the Technical University of Dresden has set up a new fusion neutron laboratory with an accelerator-based intense DT neutron generator, TUD-NG. It provides a typical neutron yield at DT (deuterium-tritium) energies up to several 1011 s-1 and at DD (deuterium-deuterium) energies up to several 109 s-1. Operation can be in continuous and pulsed mode, the machine control provides microsecond and nanosecond pulsing. Accelerated deuterons with energies up to 325 keV bombard water-cooled solid targets containing tritium or deuterium. The maximum beam current achieved so far is approximately 8 mA at the target, the laboratory is licensed for a maximum DT neutron yield of 1012 s-1. The setup of experiments is very flexible, and irradiations of materials and small samples at controlled temperatures up to several hundred degrees Celsius are possible.

The laboratory has been involved in the European fusion research since its commissioning through close collaboration with Karlsruhe Institute of Technology. In the past, measurements were done on mock-ups of the European Helium-Cooled Lithium-Lead Test Blanket Module (TBM) and the Helium-Cooled Pebble-Bed TBM for ITER as well as activation experiments on fusion reactor relevant materials to validate evaluated nuclear data files.

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Starting in 2010, focus shifted to R&D of nuclear instrumentation. Extensive work was done with novel self-powered neutron detector designs, radiation detectors based on silicon carbide diodes at high temperatures, and a neutron activation test system for the European ITER TBMs. Upgrades of the neutron generator and the measurement capabilities have been done recently and new ones are underway. Two mobile high-purity germanium detectors were added as well as a compact electron spin resonance spectrometer suitable e,g, for dosimetry applications. New activity standards for dosimetry purposes with low uncertainty and traceable to national standards are available as well. Present activities and future plans for exploiting the TUD-NG capabilities in fusion neutronics research are presented.

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