

Aushang

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Einladung zum Seminar über „Nukleare Energieerzeugung“

Zeit: Montag, 19. Mai 2025, 11:00 Uhr

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

Referent: Frau Yi Song, Karlsruher Institut für Technologie, INR

Titel: Boron-free SMRs Fuel cycle optimization and Safety

Abstract:

The elimination of soluble boron in Small Modular Reactors (SMRs) offers advantages such as an enhanced negative moderator temperature coefficient, reduced corrosion, and simplified chemical systems, driving growing interest in Soluble-Boron-Free (SBF) designs. Without soluble boron, excess reactivity control at the Beginning of Cycle (BOC) relies on burnable absorbers and control rods, potentially increasing power peaking factors and requiring careful core design to ensure safety margins. This study refines an academic SBF Karlsruhe Small Modular Reactor (KSMR) core model using CASMO5 and SIMULATE5, targeting an equilibrium cycle through a two-batch refueling strategy by optimizing fuel enrichment, burnable absorber rod configuration, and Gd_2O_3 content. A Golang-based tool, CoreOptimizer, was developed to automate core evaluation and input generation, enabling efficient optimization. The resulting core design meets safety and performance criteria, and the optimization process and key core characteristics are presented.

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