



Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska (UZ3)
Departament Badań Układów Złożonych (DUZ)
Wtorek: **17.12.2024, godz. 17:30 (wyjątkowo)**

transmisja online: <https://www.gotomeet.me/NCBJmeetings/uz3-and-phd4gen-seminars>

Speaker: online

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Analysis of buffer-IPyC separation in TRISO fuel particles

Abstract:

During High Temperature Gas-cooled Reactor (HTGR) operation, and due to the neutron irradiation in the reactor core, damage of the nuclear fuel coating layers occurs. The mechanism of damage formation in the TRISO fuel is explored by the Advanced Gas Reactor (AGR) Fuel Development and Qualification Program, in which the debonding process between coating layers was also investigated. The purpose of the research was to report simulation results for two models. Firstly, the debonding restricted model, where no gap formation between buffer and IPyC layers is permitted. Secondly, a debonding enabled model, where the gap between those layers is created. The simulations were performed with the Bison code. The inputs of the simulated models are based on data from the AGR-1 experiment. The research included simulations on spherical and aspherical fuel types. The simulations match results obtained by the AGR-1 experiment, which as such shows that the Bison code is a good computational method for simulating the behavior of the gap between buffer and IPyC layers in TRISO fuel.

Serdecznie zapraszamy
Tomasz Kwiatkowski, Mariusz Dąbrowski

Bio:

Dr inż. Zuzanna Krajewska - works as an assistant professor at the National Center for Nuclear Research (Poland) and as a postdoc at Idaho National Laboratory (USA). Her main area of research at both institutions is the study of nuclear fuel called TRISO, which is used in high-temperature reactors. Her work focuses on creating a bridge between experimental work and computer simulations. The main goals of her research on TRISO fuel are to better understand the behavior of the fuel after it has been irradiated in a reactor, to seek alternative and faster techniques for examining the fuel, and to improve the Bison code that helps scientists simulate TRISO fuel under various operating conditions.