



Please join my meeting on your computer, tablet or smartphone:
<https://www.gotomeet.me/NCBJmeetings/uz3-and-phd4gen-seminars>

**Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska (UZ3)
Departament Badań Układów Złożonych (DUZ)**

Wtorek: **10.11.2020**
11:30

Nairi Baghdasaryan

Pressure buildup analysis of TRISO coated fuel particles

Abstract:

The pressure buildup in the buffer layer of TRISO fuel particles is one of the most important factors influencing the mechanical behaviour of the fuel. The pressure inside the particles is a driving force for many other phenomena (such as kernel migration, chemical attack of SiC layer, mechanical degradation, etc), therefore even small changes in pressure value could later have a critical impact on the fuel performance. Current TRISO fuel performance models are considering only Xe, Kr and CO (CO₂) gases, however, at high burnup values low concentration gases also could have an essential impact. Therefore, in this research, we analyzed pressure buildup inside TRISO particles including also binary and ternary fission gases. The concentrations of fission gases inside the fuel kernel was calculated by Serpent code. For the calculations of molecular gases, Proksch approximations were used. Pressure values inside TRISO particles were calculated using both the Redlich-Kwong equation of state and ideal gas law. Finally, the maximum stress on the TRISO particles SiC layer was estimated using thin-shell approximation and the failure fraction of the SiC layer was evaluated. Calculations are done both for UCO and UO₂ type fuel kernels for max 150MWd/kgU burnup level.

Serdecznie zapraszamy,
M. Dąbrowski, T. Kwiatkowski

<http://www.phd4gen.pl>