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: **19.05.2020**
11:30

Michał Górkiewicz

On the modelling of thermal-hydraulics and neutronics coupling for designing of a prismatic HTGR core with the HTTR fuel block structure

Abstract:

The High-Temperature Gas-cooled Reactor (HTGR) cores are characterized by significantly different neutronic and thermal-hydraulic properties comparing to other systems like Light Water Reactors (LWR) or Fast Breeding Reactors FBR. Due to long neutron migration length in graphite, long-range neutronic spatial effects should be taken into consideration. Yet, the deep neutron thermalisation imposes high flux gradients and other important effects. The double heterogeneity of the reactor core caused by a fine structure of fuel compacts containing TRIstructural-ISOtropic (TRISO) particles also should be taken into consideration for assessing the neutron spectra effects. Those features can be significant for the thermal-hydraulic performance of the reactor due to existing feedback between core temperature and power distributions. Due to declared TRISO particles properties, such as high resistance to their damage, it is essential to identify and assess physical conditions that can increase the risk of radioactive material released from the fuel. For this, one needs to develop calculation models that allow for assessment of power, temperature and burnup peaks in the core. In order to estimate hot spots in a fuel element in the HTGR prismatic core a thermal-hydraulic model is being created for the core case that utilises the High Temperature engineering Test Reactor (HTTR) fuel block structure, using Computational Fluid Dynamics (CFD) software – OpenFoam code. During the presentation, the applied methodology for the HTTR core simulation will be described including ideas for CDF and neutronic coupling.

Serdecznie zapraszamy,
M. Dąbrowski, T. Kwiatkowski

http://www.phd4gen.pl