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Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska (UZ3)
Departament Badań Układów Złożonych (DUZ)
Wtorek: **20.10.2020**
11:30

dr hab. inż. Marcin Szuta, prof. NCBJ
dr Elżbieta Strugalska-Gola

Average high energy neutron flux distribution in the Quinta sub-critical assembly irradiated with deuteron beam of 2.0 GeV energy applying the actinide spectral index method

Abstract:

During the seminar the results of investigations of nuclear-physical characteristics of neutron fields generated in a massive uranium target irradiated by deuterons with an energy of 2.0 GeV will be presented. Twenty-three natural uranium samples spatially arranged in a subcritical assembly Quinta (at the Joint Institute for Nuclear Research, Dubna, Russia), were irradiated with spallation neutrons. We have processed the experimental data based on gamma-ray spectrometry in order to obtain the number of neutron-induced fissions and neutron captures in the detector foils. Applying the try and error method we have found that the neutron energy for which the ratio of the fission cross-section to the capture cross-section of the natural uranium from the nuclear database is equal to the measured ratio of the spectral indexes. The retrieved distinct fission and capture cross sections for the distinct neutron energy from the nuclear data base describe the average values which enabled us to evaluate the average neutron flux and neutron fluency distribution in the assembly.

Serdecznie zapraszamy,
M. Dąbrowski, T. Kwiatkowski

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