

Determination and Monte Carlo Simulations of Neutron Flux Inside Spallation Target QUINTA

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Management of spent nuclear fuel is a serious issue. Use of accelerator driven systems (ADS) seems to be a convenient solution. The international collaboration “Energy and Transmutation of Radioactive Waste” focuses on experiments with special setups consisting of a spallation target (lead or uranium) and a subcritical blanket (graphite, natural or depleted uranium) which surrounds the target. These experiments are performed at the Joint Institute for Nuclear Research, Dubna, Russia on Phasotron or Nuclotron accelerator. The setups are irradiated by high-energy proton or deuteron beams and huge neutron fields are produced due to spallation and fission reactions. The neutron distributions are measured by activation detectors and evaluated by activation techniques. Recently, our group concentrated on experiments with subcritical target called QUINTA. Results of the QUINTA experiments are presented. Neutron flux (reaction rates) evaluated in various positions inside the setup was compared with Monte Carlo simulations.