AGA 14: Reactor Depletion and Transmutation

Time: Friday 10:00–10:30 Location: EMH 225

AGA 14.1 Fri 10:00 EMH 225

Minor Actinide Transmutation in Accelerator Driven Systems — •Friederike Friess — IANUS, TU Darmstadt

Transmutation of radioactive waste, the legacy of nuclear energy use, gains rising interest. This includes the development of facilities able to transmute minor actinides (MA) into stable or short-lived isotopes before final disposal. The most common proposal is to use a double-strata approach with accelerator-driven-systems (ADS) for the efficient transmutation of MA and power reactors to dispose plutonium. An ADS consists of a sub-critical core that reaches criticality with neutrons supplied by a spallation target.

An MCNP model of the ADS system Multi Purpose Research Reactor for Hightech Applications will be presented. Depletion calculations have been performed for both standard MOX fuel and transmutation fuel with an increased content of minor actinides. The resulting transmutation rates for MAs are compared to published values. Special attention is given to selected fission products such as Tc-99 and I-129, which impact the radiation from the spent fuel significantly.