

# Measurement of Fission Cross-Sections with Lead Slowing-down Spectrometer using Digital Signal Processing

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For transmutation of minor actinide (MA) in nuclear waste and generation of electricity by Accelerator Driven System (ADS), a variety kind of nuclear data are needed. The nuclear data are essential for calculation of reactor characteristics such as critical safety, kinetics, decay heat and so on. Especially, neutron induced fission cross-sections are crucial because the transmutation of the nuclear waste is based on a fission reaction.

However, the present nuclear data are not enough in quality and quantity. For example, evaluated neutron induced fission cross-sections of  $^{237}\text{Np}$  show marked discrepancies.

Therefore, the present study aims to measure neutron induced fission cross-sections of actinide nuclei and to contribute the improvement of nuclear data.

The neutron induced fission cross-sections of  $^{237}\text{Np}$  and  $^{241}\text{Am}$  have been measured relative to that of  $^{235}\text{U}$  with a back-to-back type double fission chamber. These nuclei account for the greater part of the nuclear waste. The measurement was performed using the Kyoto University lead slowing-down spectrometer driven by an electron linear accelerator (KULS).

In the present work, the energy region was extended to about 1 MeV owing to the reduction of the electromagnetic noise with digital signal processing (DSP). DSP is the method of acquiring various information by analyzing the digital waveform data.

The results are compared with the evaluated data of JENDL-3.3, ENDF/B-VI.8 and JEFF-3.1.