

# Neutron capture study by ANNRI

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## Abstract:

Accurate data of neutron-capture cross sections for Minor Actinides (MAs) and Long-Lived Fission Products (LLFPs) are required for the study of nuclear transmutation of radioactive waste, designs of innovative nuclear reactor systems and so on. Therefore, a new experimental apparatus called "Accurate Neutron-Nucleus Reaction measurement Instrument (ANNRI) has been developed and installed on the neutron Beam Line No.4 (BL04) of the Materials and Life science experimental Facility (MLF) in the Japan Proton Accelerator Research Complex (J-PARC). The ANNRI has two detector systems. One of them is a large Ge detectors array called "4 $\pi$ Ge spectrometer", which consists of two cluster-Ge detectors, eight coaxial-shaped Ge detectors and BGO Compton suppression detectors. **Figure 1** shows what the ANNRI and the "4 $\pi$ Ge spectrometer" actually look like.

The operation using the ANNRI in the J-PARC/MLF has been started for neutron-capture cross-section measurements of minor actinides and long-lived fission products.



**Figure 1** Photos of the ANNRI at the BL04 of the MLF in J-PARC (Left), and the "4 $\pi$ Ge spectrometer" (Right) equipped with the ANNRI.

In this workshop, an outline of the ANNRI will be introduced, and also activities of neutron-capture cross-section measurements using the ANNRI will be presented.

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