



553rd ASRC Seminar

Date: 13:30 ~ 15:00, 10 June

Location: Meeting room 103, ASRC Building

Speaker: Prof. Krzysztof Rykaczewski
(Physics Division, Oak Ridge National Laboratory)

Title: Beta-strength, decay heat
and anti-neutrino energy spectra
from total absorption spectroscopy

The Modular Total Absorption Spectrometer (MTAS) has been recently constructed and commissioned at the Holifield Radioactive Ion Beam Facility (HRIBF) at Oak Ridge National Laboratory. MTAS consists of 19 NaI(Tl) modules of hexagonal shape, with a total weight of about 2200 pounds. MTAS efficiency for full gamma energy absorption is about 78 % and 70% for 0.3 MeV and 5 MeV single γ -ray, respectively. The scientific program for MTAS focuses on the beta decay studies of fission products. Understanding the energy release following the decay of fission products (so called decay heat) is crucial for the analysis of processes occurring in nuclear fuel in power reactors, for the radioactive waste transportation and storage as well as for the analysis of processes involving reactor anti-neutrinos. Twenty-two decays of ^{238}U fission products including seven activities of highest priority for decay heat simulations were measured in 2012 at the HRIBF. The examples of MTAS results on ^{86}Br , ^{89}Kr and ^{139}Xe decays will be presented and discussed with respect to the beta-strength distribution, decay heat and antineutrino energy spectra.



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