



Contribution ID: 25

Type: **not specified**

Bonner Sphere Measurements in quasi-monoenergetic p-Li neutron fields of 243 and 387 MeV

Wednesday, June 2, 2010 10:50 AM (20 minutes)

This paper describes the results of neutron spectrometry using Bonner Sphere Spectrometer (BSS) at the ring cyclotron facility at the Research Center for Nuclear Physics (RCNP), Osaka University, Japan. The BSS system consists of 15 polyethylene (PE) spheres with spherical ^3He proportional counters in their center. It also includes two PE spheres with lead shells inside, to increase their response to high-energy neutrons above 10 MeV. A quasi-monoenergetic neutron fields at RCNP were generated from a 10 mm thick Li target using the $^7\text{Li}(p,n)^7\text{Be}$ reaction, injected by 245 and 388 MeV protons. The neutrons produced at 0° and 30° were extracted into the time-of-flight (TOF) tunnel of 100 m length through the concrete collimator of $10 \times 12 \text{ cm}^2$ aperture and 150 cm thickness. The neutron energy spectra were measured at distance of 41 m from the target in the TOF tunnel. To deduce the energy spectra of neutrons from thermal to 1 GeV, an unfolding method with MSANB code was used together with response functions obtained by neutron transport calculations using the MCNP/LAHET code. The neutron energy spectra are discussed in terms of neutron fluence rates and ambient dose equivalent $H^*(10)$. The BSS results are also compared to neutron energy spectra measured by a NE213 organic liquid scintillator using the TOF method.

Primary author: MARES, Vladimir (Helmholtz Zentrum Muenchen, Institute of Radiation Protection, Germany)

Co-authors: PIOCH, Christian (Helmholtz Zentrum Muenchen, Institute of Radiation Protection, Germany); IWASE, Hiroshi (Radiation science, KEK, Tsukuba, Japan); NAKAMURA, Takashi (Cyclotron and Radioisotope Center, Tohoku University, Sendai, Japan)

Presenter: MARES, Vladimir (Helmholtz Zentrum Muenchen, Institute of Radiation Protection, Germany)

Session Classification: Session 1 - Source term and related topics

Track Classification: Source term and related topics