Contribution ID: **98** Type: **Oral talk (15 min + 5 min questions)**

PHOTONUCLEAR REACTIONS: SOME POSSIBILITIES FOR METHODOLOGICAL IMPROVEMENT

Wednesday, 13 July 2022 15:45 (20 minutes)

Cross sections for photonuclear reactions in the energy range of giant dipole resonance have often been measured. One of the most commonly used experimental methods was the activation of a selected material in a high-energy bremsstrahlung beam. Considering that there is still a need for reliable results of cross-sectional measurements of photonuclear reactions, this work will refer to some results aimed at improving the methodology itself.
Insufficiently precise knowledge of the energy spectrum and intensity of the high energy photon beams has lead to the use of comparators, ie. materials of well known activation properties. With a known geometry of bremsstrahlung production, it is possible to obtain a reliable energy distribution of the emitted photon radiation using some simulation routine. In this case, the photon beam can be calibrated by measuring the dose. By the activation of the gold (for which the cross section for (γ,n) reaction is well known) and dosimetry measurements, calibration of photon beams of Microtron 25, in the energy interval from 5 MeV to 25 MeV was performed. Dosimetry measurements were done using calibrated ionization chamber intended for dosimetry control of photon beams of therapeutic linear accelerators.
Reconstruction of cross-sections from photoactivation measurements has so far been performed using different numerical procedures. In reactor physics, powerful computer algorisms have been developed to solve similar problems – to estimate the shape of the energy differential cross section based on neutron activation measurements. It has been shown [1] that a couple of such software packages can be successfully used in photoactiovation measurements, in the energy range up to 10 MeV. In this work, a step further was done and mentioned software codes were tested on the example of gold activation at energies up to 25 MeV.

1. Z. Medić, The European Physical Journal A 57, 258 (2021)

The speaker is a student or young scientist

No

Section

1. Experimental and theoretical studies of nuclear reactions

Primary authors: KRMAR, Miodrag (Faculty of Science, University Novi Sad); MITROFANOV, S.V. (JINR); TETEREV, Y.G. (JINR); ISSATOV, A. (JINR); TIMOSHENKO, R.D. (JINR); ALEXEEV, S.I. (JINR); MALETIC, D. (Institute of Physics,Belgrade, Serbia); KNEZEVIC, D. (University of Novi Sad, Novi Sad, Serbia); JOVANCEVIC, N. (University of Novi Sad, Novi Sad, Serbia)

Presenter: KRMAR, Miodrag (Faculty of Science, University Novi Sad)

Session Classification: Experimental and theoretical studies of nuclear reactions