
THE FIRST RESULTS FROM STUDIES OF GAMMA DECAY OF PROTON-INDUCED EXCITATIONS AT CCB FACILITY

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A new experimental facility – Cyclotron Centre Bronowice (CCB) was opened two years ago in Krakow, Poland. One of the significant programs for the laboratory is the nuclear structure research with the use of accelerated proton beam with well-defined energy in range 70 – 230 MeV. After a series of promising test experiments held within 2014 and 2015, the very first experiment funded by ENSAR2 program was performed in July 2016.

The experimental setup consisted of two detector arrays working in a coincidence mode: HECTOR [1] (8 BaF₂ big scintillator crystals) with an addition of two pure LaBr₃:Ce (3.5” x 8” and 2” x 2”) for high energy γ -rays detection, and KRATTA [2] (24 telescope detectors: photodiode + CsI(Tl) + CsI(Tl)) for scattered protons measurement. The target was placed in a vacuum chamber with a large Mylar window.

Scattered protons were registered by the KRATTA detectors placed in front of the chamber window, while non-interacting ones were transported in vacuum to a graphite beam dump. The reaction of proton scattering was used to excite carbon and lead nuclei and the gamma decay of excited states in coincidence with scattered protons was measured.

The poster will present the experimental setup and analysis method, as well as, preliminary results. In particular, γ -ray energy spectra gated on various excitation energies corresponding to the decay to the ground and excited levels of studied nuclei will be presented.

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REFERENCES

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