

MEASUREMENT OF THE TOTAL REACTION CROSS SECTION ON THE DETECTION SETUP “MULTI”

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Development in radioactive beams uncovered the opportunities to perform experimental research of nuclear properties in the region of nuclei far from β -stability line. Beams of light, neutron-rich nuclei can provide isotopes with high N/Z ratio, which allows the phenomena like neutron skin and neutron halo to be investigated. The portable spectrometer MULTI assembled at the beamline of the ACCULINNA in-flight separator in the FLNR JINR provide valuable data for total reaction cross section measurement (“bump” in the total reaction cross section in the region of $\sim 17 A$ MeV), which are subject of further theoretical research. Spectrometer MULTI consists of an in-beam telescope for the projectile identification and a gamma spectrometer for the event tagging (Fig. 1). Construction of the spectrometer, principles of operation based on the modified transmission method and the event tagging with prompt gammas and neutrons accompanying the nuclear reactions, together with the experimental setup characteristics are discussed.

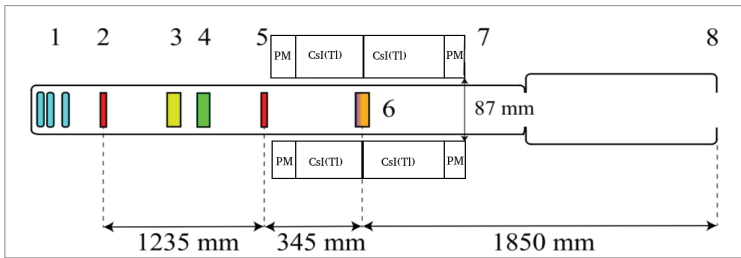


Fig. 1. Scheme of the detector setup “MULTI”: 1 – degrader; 2 – active collimator AC1; 3 – 300 μm silicon pixel detector ΔE “16X-16Y”; 4 – 380 μm silicon detector ΔE_0 ; 5 – active collimator AC2; 6 – 243 μm active target Si – PIN; 7 – 12x CsI(Tl) gamma spectrometer; 8 – remote beam dump.