

Study of active shielding for γ -spectrometers

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The cosmic (muonic) component of detector background is often reduced by veto detectors surrounding the passive shields. Quite intensive order of magnitude background reduction factors are reported^{1,2} but the details of anticoincidence spectroscopy (random coincidences related to spectrum thresholds, time spectrum, and system dead time are clearly reported. These issues were studied on the system consisting of the 36% efficiency GMX type low background Ortec detector, the 12 cm thick lead shield and five 50 cm x 50 cm x 5 cm plastic scintillators made by Sconics. The present results show that the timing and spectrum threshold can produce electronic, non-physical background reduction via the uncorrected system dead time. The influence of the plastic veto shields on the neutron induced background is discussed.