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Characterization of clover detectors for use in fIREBAll project[1]

ZARIF RAHMAN, University of Wisconsin- La Crosse, KEVIN LEE, WANPENG TAN, ANI APRAHAMIAN, University of Notre Dame, SHELLY LESHER, University of Wisconsin- La Crosse — Measurement of conversion electrons is an important aspect of nuclear structure studies. A new fIREBAll (fInternal conveRsion Electron Ball Array) array is being constructed by building on the existing "ICEBall" mini-orange array of SiLi detectors. fIREBAll will come into existence from the replacement of the current array of six mini-orange Si(Li) detectors of ICEBall with twelve Si(Li) detectors to broaden the energy range of the detected electrons. fIREBAll will be used in conjunction with two Compton suppressed Ge detectors. Compton suppression shields of Bizmuth Germanate (BGO) will be used on two clover detectors for coincidence measurements of gamma-rays and conversion electrons. I have studied the clover detectors in order to characterize their efficiencies and resolutions. They were calibrated using ^{60}Co and ^{252}Eu sources and a digital DAQ system. Each of the four crystals for each clover detector were evaluated separately and in summing of all four quadrants. This work is based on the full characterization of the energy resolution and the detection efficiency of the two clover detectors envisioned for use with fIREBAll.

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