

CALIBRATION OF LARGE BGO AND NAI DETECTORS USING 270 MeV ^3He IONS

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We have extended calibrations of the light output (L) versus energy reported earlier¹ for BGO scintillator with protons, etc. using 270 MeV ^3He ions. The new measurements include the response of a 2" diameter \times 4 inch long NaI crystal together with data for a 2" \times 6" BGO crystal. These data are needed to interpret the scintillator spectra observed for light particles produced in energetic heavy ion collisions near $\theta = 0^\circ$. At the Michigan State Superconducting Cyclotron and ANL-ATLAS we have apparently observed

protons and alpha particles, $E > 1/2 E_{\text{beam}}$, for $E_{\text{beam}} = 300$ to 640 MeV. However, previous scintillator calibrations had to be extrapolated and hence may not be valid. The new calibrations were done on the old QDDM beam line with a variety of targets and absorbers which provided data up to 270 MeV and thus should permit reliable extrapolation of calibrations¹ done at lower energies ($E < 120$ MeV).

1) F.D. Becchetti, C.E. Thorn, P.M. Lister, Nucl. Inst. Meth., 225, 280 (1984).