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MEASUREMENT OF ANGULAR CORRELATION SOLID ANGLE CORRECTIONS FOR A COAXIAL Ge(Li) DETECTOR*

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Experimental finite solid-angle corrections have been determined for a coaxial Ge(Li) detector. A comparison between these experimental values and calculated values is shown.

In interpreting the results of gamma-gamma angular correlation measurements, one must take into account the finite solid angles subtended by the detectors. The appropriate corrections for NaI(Tl) crystals have been measured in many laboratories over the past 15 years.

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At present, because of the fact that the use of Ge(Li) detectors in gamma-gamma angular correlation measurements is relatively recent, there is little available information concerning the solid angle corrections for Ge(Li) detectors. We have determined the photopeak solid angle corrections[1–3])

$$Q_2 = \int N(\beta) \sin\beta P_2(\cos\beta)\, d\beta / \int N(\beta) \sin\beta P_0(\cos\beta)\, d\beta$$

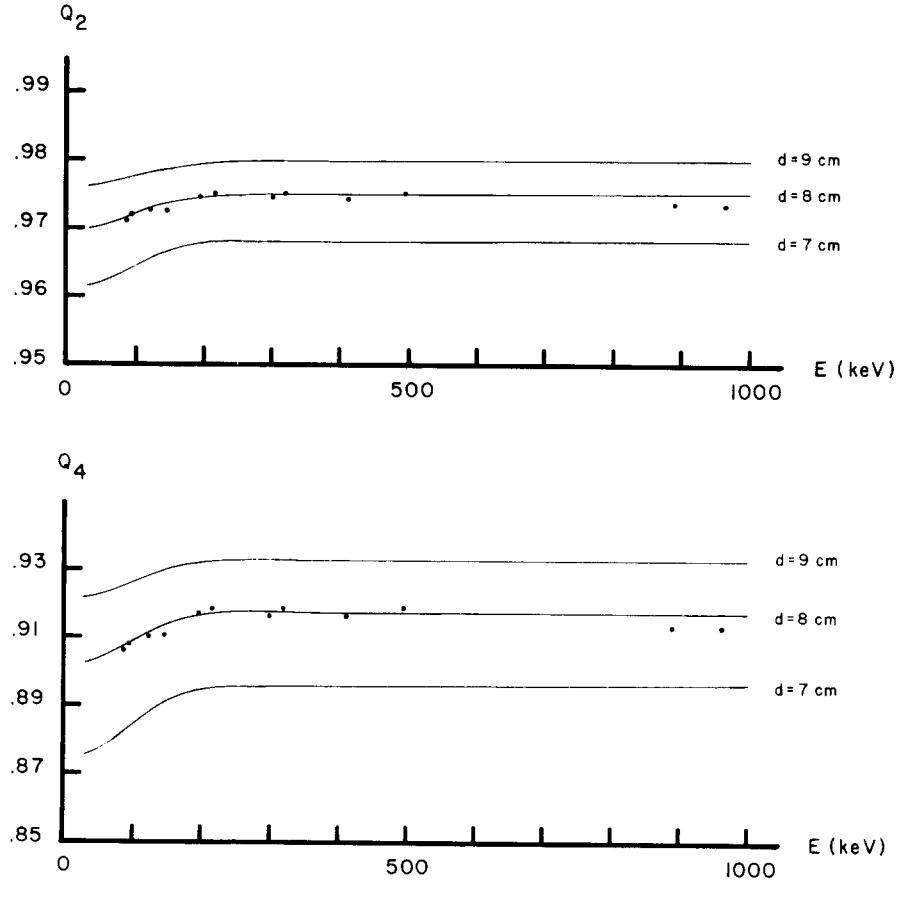

Fig. 1. A comparison between the experimental results of this investigation and the calculations of Camp and VanLehn[4]). A source-to-detector distance, *d*, of 8 cm was utilized in the experiment. The solid lines follow the calculated values of Camp and VanLehn, while experimental values are shown as heavy dots.

and

$$Q_4 = \int N(\beta) \sin\beta P_4(\cos\beta)\, d\beta / \int N(\beta) \sin\beta P_0(\cos\beta)\, d\beta ,$$

by means of a collimated beam experiment, for a coaxial Ge(Li) detector with the following characteristics: diameter = 32.200 mm, n-region = 0.800 mm, depletion depth = 8.200 mm, length = 2.650 cm, area = 5.770 cm^2, volume = 15.292 cm^3. Fig. 1 shows a comparison of our experimental results and the calculations of Camp and VanLehn[4]). The agreement is excellent.

References

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