Contribution ID: **68** Type: **Contributed Talk**

Current Status of the AGATA Prototype Detector Analysis and Comparison of Experimental and Theoretical Data Sets

Wednesday 14 September 2005 11:30 (15 minutes)

Nuclear structure studies utilizing the technique of gamma ray spectroscopy requires the use of state of the art detector systems. The advent of highly segmented High-Purity Germanium detectors and the method of Pulse Shape Analysis to determine the positions of interactions [1] will allow for greatly improved efficiency as well as excellent angular resolution. The Advanced Gamma Tracking Array (AGATA), when completed, will consist of 180 of these large volume, 36-fold segmented HPGe detectors mounted in a spherical geometry to cover the full solid angle [2]. Advanced digital electronics developed especially for this application will be utilized.

Detailed scans of the AGATA prototype detector have been performed using a precision scanning table and a fully digital data acquisition system at the University of Liverpool in order to characterise the detector's response and its position sensitivity. Comparison of this data to theoretical results from electric field simulation software (MGS) [3] is paramount to the completed array's functionality as it will provide a method of matching the induced pulse shapes, using a least squares fit technique, to a specific position of interaction for the entire array. This position resolution will be of the order of a few millimetres, as image charge shape and asymmetry differ substantially between interaction positions of this order.
Preliminary results show that the detector is capable of producing such position sensitivity and the comparison of experimental and theoretical data sets shows excellent agreement. A summary of the methods used and up-to-date results of this ongoing analysis will be presented.

References

[1] Svensson C.E. Position sensitivity of the TIGRESS 32-fold segmented HPGe clover detector. Nuclear instruments and methods A, 2005: 540: 348-360.
[2] Gerl J, W Korten. Technical proposal for an Advanced Gamma Tracking Array for the European gamma spectroscopy community. 2001.
[3] Medina P, Santos C, Villaume D. A simple method for the characterization of HPGe detectors. IRes.

Author: NELSON, Laura (University of Liverpool)

Presenter: NELSON, Laura (University of Liverpool)

Session Classification: S8 : Applications in Nuclear Physics

Track Classification: Applications in Nuclear Physics