

## Tracking arrays and the development of imaging capabilities

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New developments on detection systems have been going on since the mid 90's order to build arrays with improved sensitivity by increasing peak to total (P/T) and efficiency. The adopted solution is the use of large volume GeHP detector with position sensitivity based on segmented contacts and Pulse Shape Analysis (PSA). In these new arrays the target can be surrounded by hundreds of position sensitive GeHP detectors, in a 4pi solid angle geometry, in such a way that up to about the 80% of the solid angle is covered, thus increasing the detection efficiency dramatically. Using digital sampling electronics and PSA it is possible to determine energy, position and time of each gamma-ray interaction and, subsequently, applying tracking algorithms it is possible to reconstruct the scattering paths of incident gamma-rays inside the detector [1].

A further improvement would be to use detectors with higher position resolution, e.g. planar GeHP DSSD detectors, as implanters or first scatterers, which will provide the array with imaging capabilities [2].

In this contribution we will show the conceptual ideas and the R&D on detector technologies performed by our collaboration.

[1]S. Akkoyun et al., AGATA — Advanced Gamma Tracking Array, Nucl. Instrum. Meth. A 668 (2012) 26

[2]M. Doncel et al. "Conceptual design of a high resolution Ge array with tracking and imaging capabilities for the DESPEC (FAIR) experiment." Journal of Instrumentation 10.06 (2015) P06010.

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