

## TECHNICAL DATA SHEET

# MINIBALL ENCAPSULATED GERMANIUM DETECTORS FOR CLUSTER (SEGMENTED INTO 6)

### SIZE OF THE DETECTOR

- The N-type hyperpur Germanium will have initial dimensions of 70 mm (diameter) and 78 mm (length) and will be tapered into an hexagonal shape according to EUROBALL III design.
- The relative efficiency @ 1.33 MeV after shaping will be  $\geq 55\%$  (source at 25 cm from the front face).

### FABRICATION

- The outer contact of the Germanium diode will be ion implanted, segmented in six angular sectors of  $60^\circ$  each.

### ENERGY RESOLUTION

- The full volume energy resolution of the detector, measured for 1.33 MeV gamma rays from a  $^{60}\text{Co}$  source, will be  $\leq 2,3$  keV (full width at half maximum FWHM). For 122 keV gamma rays from a  $^{57}\text{Co}$  source, the resolution will be  $\leq 1,2$  keV FWHM. These resolutions will be measured with main spectroscopy amplifier time constant of  $\geq 4 \mu\text{s}$ . For each measurement, the source will be placed 25 cm from the front face of the crystal. The total count rate will be  $\leq 10^3 \text{ S}^{-1}$ . The number of counts in the photopeaks will be  $\geq 10^5$ .
- The segmented resolution (with room temperature preamplifier) from a  $^{60}\text{Co}$  source will be about 3 keV.

### PEAK TO COMPTON

- The measured Peak to Compton for 1.33 MeV gamma rays (measured in the standard way) will have a minimum value of 60 :1.

### MECHANICAL

- The cap of the detector is hexagonally shaped in the front (61,35 mm flat to flat), cylindrical in the rear (nominal diameter 75 mm before welding), tapered at an angle of 4,125°.
- The detector will be encapsulated into an hexagonal aluminium cap with autonomous ultra high vacuum according to a licenced procedure developed by EURISYS MESURES/KÖLN UNIVERSTY/KFA JÜLICH.
- The aluminium cap wall thickness is 0,7 mm.

### OPTION

- As an option, EURISYS MESURES can deliver a set of installation in a cryostat consisting of :
  - The internal full volume preamplifier head
  - The set of feedthrough (total of 7)
  - The set of 7 external preamplifier boards
  - The HV filter
- Cryostat for one single detector, or a triplet of 3 detectors on request.