Contribution ID: **15** Type: **poster**

HEROICA: a fast screening facility for the characterization of germanium detectors

Thursday, 11 April 2013 15:00 (1h 20m)

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In the course of 2012, a facility for fast screening of germanium detectors called HEROICA (Hades Experimental Research Of Intrinsic Crystal Appliances) has been installed at the HADES underground laboratory in the premises of the Belgian Nuclear Research Centre SCK.CEN, in Mol (Belgium).
The HEROICA facility allows the determination of all typical germanium detectors'operational parameters within a short time frame and it consists of:
1. Two static tables, with a lead shield surrounding the detector, suitable for measurements with a test source placed in fixed positions: this set-up is used for the determination of the energy resolution, the active volume, the average deadlayer and other detector properties;
2. Three automated mechanical set-ups, provided with a movable, motor-controlled arm, which allow performing a full surface scanning of the diode with a collimated source: the primary scope is to study the deadlayer and charge collection variations.
The set-ups are coupled to complementary data acquisition systems, both analog (MCA) and digital (FADC), which are run in parallel thanks to automated scripts developed on purpose.
The high level of automation allows a fast characterisation of larger batches of diodes in reasonable time. Additionally, the overburden of 225 m guarantees a limited cosmic activation of the germanium detectors and of the equipment. The proximity of HADES to the germanium diode manufacturer Canberra N.V. in Olen (about 30 km distance) is also advantageous. The HEROICA testing area was first commissioned in the framework of the characterisation of Broad Energy Germanium (BEGe) detectors for the second phase of the GERDA experiment. It completely fulfilled the requirements of the 30 BEGe diode production: flexibility during the diode production and testing phase, reduced exposure to cosmic radiation and screening of two diodes/week on average. Following-up screening activities with natural Germanium diodes are in preparation.
To summarize, HEROICA has proven to be an adequate screening facility for fast, detailed and almost background-free detector characterization. This will be of major interest especially for next generation rare event physics experiments based on a large number of detectors.

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Session Classification: Poster session

Track Classification: Cosmogenic activation and low background techniques in experiments