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Scintillating bolometers for Double Beta Decay search

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In the field of Double Beta Decay searches the possibility to have high resolution detectors in which background can be discriminated results very appealing. This very interesting possibility can be fulfilled in the case of a scintillating bolometers containing a Double Beta Decay emitter whose transition energy exceeds the one of the natural gamma line of ^{208}Tl .

We present the latest results obtained in the development of such kind of scintillating bolometers. For the first time an array of five CdWO_4 (^{116}Cd has a Double Beta Decay transition energy of 2805 keV) crystals is tested. The array consists of a plane of four $3\times 3\times 3\text{ cm}^3$ crystals and a second plane consisting of a single $3\times 3\times 6\text{ cm}^3$ crystal. This setup is mounted in hall C of National Laboratory of Gran Sasso inside a lead shielding in order to further decrease the environmental background.

The aim of this test are finally demonstrate the technical feasibility of this technique through an array of detectors and perform a long background measurement in the best conditions in order to prove the achievable background in the $0\nu\text{DBD}$ region.

In the same run a new, large, ZnSe crystal is tested. ZnSe crystal works very well as thermal bolometer and further study are on going about scintillation light.

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