Contribution ID: **119** Type: **not specified**

# Identification of multi-site events in coplanar grid CZT detectors for the COBRA experiment

COBRA is a next-generation experiment searching for the existence of neutrinoless double beta decay ($0\nu\beta\beta$-decay). The aim is to clarify the nature of neutrinos as either Dirac or Majorana particles. Furthermore, the study of $0\nu\beta\beta$-decay could allow for the identification of the neutrino mass hierarchy realized in nature and the determination of the effective Majorana neutrino mass in case of a signal.

Currently a demonstrator setup at the underground facility LNGS (Italy) built of $4\times4\times4$ coplanar grid (CPG) detectors collects high quality low background physics data with FADC pulse shape sampling. The detectors are made of natural abundant CdZnTe, which is a commercially available room temperature semiconductor. It contains several double beta isotopes, the most promising of which is Cd-116 with a Q-value of 2813.5 keV – which is well above the highest naturally occurring prominent gamma lines. One of the key instruments to further reduce background is the discrimination of so called single-site events (SSE) and multi-site events (MSE). The signal of a double beta decay is expected to be a single detector event with a single-site energy deposition in the crystal. Hence, all MSEs for the same energy can be vetoed as background.

This poster summarizes a newly developed approach to identify MSEs via pulse shape analysis and first efficiency calculations.

**Primary author:** ZATSCHLER, Stefan

**Presenter:** ZATSCHLER, Stefan