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Background rejection and sensitivity for new generation Ge detectors experiments

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Germanium detectors have been used in several experiments searching for Rare Events due to their good features (detection efficiency, energy resolution or robustness). New generation detectors, like broad energy detectors or segmented ones, could improve the sensitivity of this kind of experiments since different background rejection techniques could be developed without losing detection efficiency.

Within these techniques, analysis of the pulse shapes in a segmented detector, in the segment where the energy deposit happens and in the adjacent ones (the so-called net and induced signals respectively), seems to be one of the most powerful ones. Applying to 76Ge double beta decay region of interest (2.0-2.1 MeV), a set of routines for pulse generation and analysis has allowed to estimate that the background could be reduced by a factor 25, keeping a detection efficiency for neutrinoless double beta decay events of 76.3% using 2kg detectors.

A summary of the development of pulse generation and analysis routines (both for net and induced signals) will be given, showing the rejection factors and detection efficiency values obtained for the different configurations considered.

Auteur principal: Dr GÓMEZ-MALUENDA, Héctor (University of Zaragoza)

Co-auteurs: Prof. VILLAR, José Ángel (University of Zaragoza); Dr CEBRIÁN, Susana (University of Zaragoza)

Orateur: Dr GÓMEZ-MALUENDA, Héctor (University of Zaragoza)

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