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NEDA - The New High Performance Neutron Multiplicity Filter

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The currently being built NEutron Detector Array (NEDA) is the neutron multiplicity filter, which will be used as ancillary device for the state of the art germanium arrays (like AGATA, GALILEO), with both intense stable and radioactive ion beams. The gain in detection efficiency, especially for the events of high neutron multiplicity, will allow to address regions of nuclear chart not achievable so far employing the existing arrays of neutron detectors.

Extensive Monte Carlo simulations were performed in order to establish optimum size of a single NEDA detector unit, as well as the geometry of the entire array. Series of measurements were performed for choosing the best scintillator and photomultiplier, optimising the neutron-gamma discrimination (NGD) and timing properties of the array. The digital algorithms both for NGD and timing were developed and their performance compared with the one of analogue methods.

The findings from the years of research and development phase of NEDA will be shown during the talk. Possible coupling with gaseous detectors will be discussed.

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