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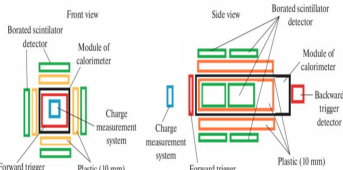
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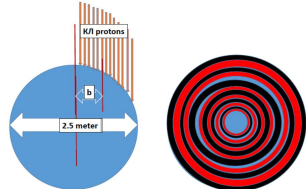
<sup>c</sup> Dubna State University, Dubna, 141980, Russia

A simplified version of the Monte-Carlo simulation of the OLVE-HERO detector, which is a ball weighing ~11 tons with a diameter of 2.5 meters and consisting of 97% by volume of borated scintillator and 3% of lead or tungsten. The aim of the work is to estimate the background level of alpha particles with an energy of ~ 1.5 MeV, formed from the capture of thermalized neutrons by boron-10 nuclei.

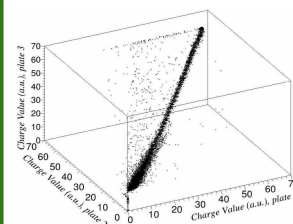
## Schemes



OLVE-HERO prototype scheme on the beam test experiment at SPS CERN

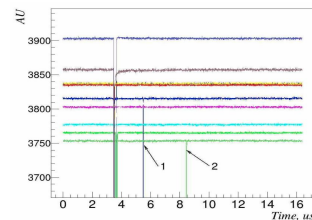


Monte-Carlo. Schematic view of the OLVE-HERO simplification detector

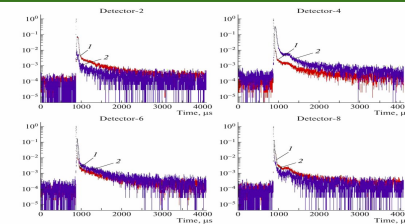


Amplitude correlation of CMS detectors

## Results for the prototype tests experiment



Example of time dependencies for the single event amplitudes with neutron peaks (1 and 2)

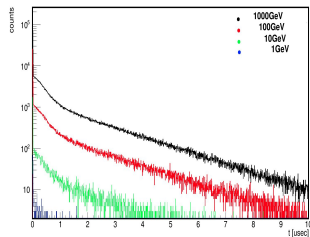


The time dependence of the neutron signals in the downstream BS detectors: (1) after the prototype shift, (2) before the prototype shift.

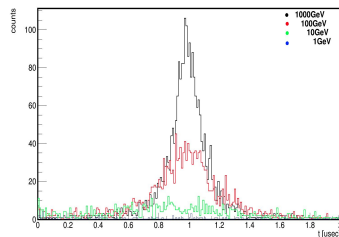
## Results for the Monte-Carlo (fixed primary energy of protons)



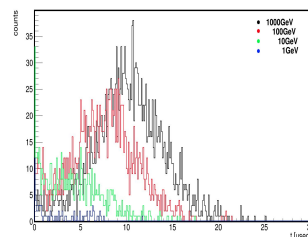
(Monte-Carlo) for primary protons with an energies those were obtained from the known CR energy spectrum.  $-15^\circ \leq \theta \leq 15^\circ$



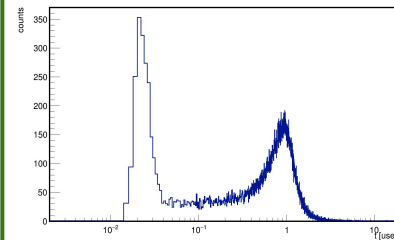
The lifetime distributions of evaporated neutrons inside of the detector for the different energies of incoming protons.



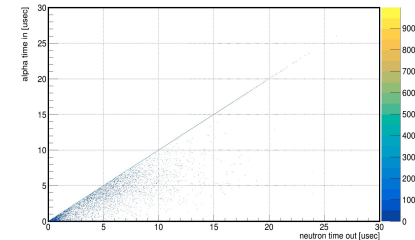
The average lifetimes of evaporated neutrons inside of the detector for the different energies of incoming protons



The time distributions of the last evaporated neutrons for the different energies of incoming protons



The average lifetimes of evaporated neutrons inside of the detector for the different energies of incoming protons



The correlation between time moment, when the last alpha particle is born in an event and the time moment when the last neutron leave the detector or it was absorbed by it