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ALMOND: An LNGS Mobile Neutron Detector

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Environmental neutrons introduce a source of background to rare event searches, such as dark matter direct searches, neutrinoless double beta decay experiments and in cross section measurements for nuclear astrophysics, which take place in deep underground laboratories. Most of these neutrons are produced at the walls of the experimental hall by means of intrinsic radioactivity of the rock and concrete. The flux and spectrum of the ambient neutrons vary greatly with time and location. Precise knowledge of this background is necessary to instrument effective shielding and veto mechanisms, leading to an improvement in the sensitivity of the neutron-susceptible underground experiments. With this poster, we give an overview of the design of a mobile low-flux neutron spectrometer for the LNGS underground laboratory in Italy and present the construction and the initial calibration efforts as well as the outlook towards the deployment and commissioning at LNGS. This project is supported by the German Federal Ministry of Education and Research (BMBF) under the grant number 05A21VK1.

Summary

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Session Classification: Poster session leading into social dinner buffet