IDM2008 - Identification of Dark Matter 2008

Contribution ID : 479

Studies of the muon-induced neutron background in LSM: detector concept and status of the installation (10'+5')

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Motivated mainly by astrophysical observations, the idea of the existence of Dark Matter has strong support today while its nature and origin remains one of the big science quests. A good particle candidate for Cold Dark Matter (CDM) is the supersymmetric neutralino or more generally a weakly interacting massive particle (WIMP). The expected interaction rate of WIMPs with the detector medium in the direct detection experiments is below 0.01 events / (kg day). This
makes a good knowledge of the background conditions highly important, especially with ever increasing sensitivity of the detectors. One of the background components is related to cosmic muons and in particular to muon-induced neutrons. Detailed studies carried out by the Edelweiss collaboration in this respect will be presented. This activity includes GEANT4 simulations with full
event topology as well as a dedicated measurement with a new neutron counter based on 1 tonne of liquid scintillator to be installed in fall 2008 in LSM (Modane, France). This counter will be incorporated into the existing muon veto system thus allowing to monitor neutrons in coincidence with the incoming muons. This work is in part supported by the German Research Foundation (DFG) through the Transregional Collaborative Research Center SFB-TR27 as well as by the EU contract RII3-CT-2004-506222.

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