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Testing DAMA/LIBRA result with ANAIS-112 experiment at the Canfranc Underground Laboratory

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The ANAIS (Annual modulation with NaI(Tl) Scintillators) experiment aims at the confirmation or refutation of the DAMA/LIBRA positive annual modulation signal in the low-energy detection rate using the same target and technique at the Canfranc Underground Laboratory (LSC) in Spain. Several 12.5 kg NaI(Tl) modules produced by Alpha Spectra Inc. have been operated in Canfranc during the last years in various set-ups. All of them have shown an outstanding light collection at the level of 15 photoelectrons per keV, which allows triggering at 1 keV of visible energy, and their background has been fully characterized. The ANAIS-112 set-up consisting of nine detectors in a 3x3 matrix configuration with a total mass of 112.5 kg was commissioned at LSC in the first semester of 2017. The dark matter run started on August, the 3rd and is running smoothly since then. The ANAIS-112 experimental plan is to take data for two years and in parallel, to explore a possible experiment upgrade. ANAIS-112 sensitivity will allow exploring the DAMA/LIBRA singled-out WIMP parameter region at 3 sigma in 5 years of data taking. Discovery potential of ANAIS-112 in present conditions is high if WIMPs are responsible of the DAMA/LIBRA annual modulation signal.

Here, the latest results on the detector performance (light collection, low energy calibration, event selection, stability..) and on the background model of all the detectors will be presented and the physics potential of the experiment will be discussed.

I am also submitting an abstract to the track: Direct Detection

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