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The Data Acquisition System for the ANAIS experiment

ANAIS (Annual modulation with NAI Scintillators) experiment will look for dark matter annual modulation with 250 Kg of ultrapure NaI scintillators at the Canfranc Underground Laboratory (LSC). The detector will consist of 20 close-packed single modules, each of them coupled to two photomultipliers (PMTs) working in coincidence. An electronic chain and data acquisition system (DAQ) have been developed to provide a redundant readout at different dynamic ranges and to digitize the PMT signals with high temporal and vertical resolution in the low energy region, that have allowed the implementation of new algorithms for noise discrimination by pulse shape analysis.

We present the design of the whole DAQ system and its characterization (stability and trigger efficiency, baseline noise reduction, dead time precise measurements, performance of homemade preamplifiers, integration with the slow control and warnings system...). Finally, preliminary results on photomultiplier response, light collection and energy resolution obtained with several prototypes are also presented.

Primary author: OLIVAN, Miguel Angel (Universidad de Zaragoza)

Co-authors: ORTIZ DE SOLORZANO, Alfonso (Universidad de Zaragoza); Dr GINESTRA, Carlos (Universidad de Zaragoza); Dr POBES, Carlos (Universidad de Zaragoza - CSIC); Dr CUESTA, Clara (University of Washington); Prof. GARCIA, Eduardo (Universidad de Zaragoza); Prof. PUIMEDON, Jorge (Universidad de Zaragoza); Prof. VILLAR, Jose Angel (Universidad de Zaragoza); Prof. AMARE, Julio Cesar (Universidad de Zaragoza); Prof. SARSA, Maria Luisa (Universidad de Zaragoza); Dr MARÍA, Martínez (Universidad de Zaragoza); VILLAR, Patricia (Universidad de Zaragoza); Prof. CEBRIÁN, Susana (Universidad de Zaragoza); Dr ORTIGOZA, Ysrael Richard (Universidad de Zaragoza)

Presenter: OLIVAN, Miguel Angel (Universidad de Zaragoza)

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