

A possible design of the readout electronics for large area SiPM detectors of the TAO experiment

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The TAO (Taishan Antineutrino Observatory) is a ton-level Gadolinium doped liquid scintillator (GdLS) detector located ~30 m far from one of the Taishan reactor cores in China serving the JUNO (Jiangmen Underground Neutrino Observatory) neutrino experiment. The goal of TAO is the measurement of the reactor antineutrino spectrum with very high energy resolution (~ 1.5% at 1 MeV). In order to maximize the photon TAO will be equipped with ~10 m² of SiPMs working at -50 C. In this work we present a proposal for the full readout electronic chain specifically designed to meet the TAO purposes. It consists on an analog readout board directly coupled to the SiPMs and a digital FPGA-based board that manages the digitization and pre-processing of the signals. The boards are currently under development. The first prototypes have shown excellent single photoelectron resolution and timing properties and their performance will be discussed at this conference.

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