

PMm2: A R&D on a triggerless acquisition for next generation neutrino experiments

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The next generation of proton decay and neutrino experiments, the post-SuperKamiokande detectors as those that will take place in megaton size water tanks, will require very large surfaces of photodetection and a large volume of data. Even with large hemispherical photomultiplier tubes (PMT), the expected number of channels should reach hundreds of thousands. An french ANR funded R&D program to implement a solution is presented here. The very large surface of photodetection is segmented in macro pixels made of 16 hemispherical (12 inches) PMT connected to an autonomous underwater front-end electronics working on a triggerless data acquisition mode. The data transmission rate towards the surface DAQ is 10 Mb/s per cable. This architecture allows to reduce considerably the cost and facilitate the industrialization.

The poster presents the complete architecture of the prototype, from the 16 PMT to the surface DAQ, and tests results with 16 (1 inch) PMT, validating the whole electronics, the built-in gain adjustment and the calibration principle.

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