The MURAVES telescope Front-end Electronics and Data Acquisition

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Abstract

The MURAVES telescope Front-end Electronics and Data Acquisition have been developed on the bases of the INFN R&D program MU-RAY. The new electronic board (SLAVE) mounts a last generation integrated read-out circuit for the Silicon Photo Multiplier (SiPM). called EASIROC. The EASIROC provide a fine bias and high gain amplification of 32 SiPMs. The board main features consists in a Time to Digital Converter with time resolution below 1 ns for the measurement of the time of fight of the muon, a programmable on-board power supply for the SiPM bias, and discriminator outputs for each of the SiPM.

The new Data Acquisition Board (MASTER) includes an on-board credit-card size computer Raspberry Pi linked in direct connection with the Master controller through its general purpose I/O port. The new Master board can manage up to 32 SLAVES of the telescope (1024 SiPMs) corresponding to 32 independent modules at a time and enables fast communication between Master board and the SiPMs read-out electronics.