

Versatile Trigger Time Recording System for Air Shower Array

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In the energy region above TeV, many experimental groups use surface air shower arrays to observe cosmic gamma rays. These experiments require accurate trigger time measurement systems to observe abrupt cosmic phenomena. Therefore, we have developed an event-trigger time recording system that accurately measures the arrival time of air showers. The system is versatile, consists of a commercially available global satellite system module with high-precision clock output capability, a time-to-digital converter with a bank reset function for accurate time measurement, and a network-time-protocol server installed on a computer. The results show that the absolute time accuracy is better than 1 μ s and the time deviation is about 11.4 ns with one standard deviation. The time accuracy of this system is expected to improve to approximately ± 40 ns.

38th International Cosmic Ray Conference (ICRC2023)
26 July - 3 August, 2023
Nagoya, Japan



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