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Simulation of Trigger Circuit using VHDL for detection of UHE Cosmic Ray by Mini-array method

Abstract content

UHE cosmic ray ESA (above 10^{15} eV) are continuously being detected by the Mini array laboratory, Department of Physics, Gauhati University [1] using Linseley's novel Miniarray method [2]. The detector array consist of eight plastic scintillation counter (size:50x50x5cm³) with total carpet area 2m² inside a hut situated at the roof top of the Physics building, Gauhati University, Assam. The detected signals are recorded with the fast and sophisticated front end electronics of Mini-array laboratory on the basis of arrival time spread of the secondary particles. A genuine EAS event is selected from the particle pulses (width-80nS, rise time-16nS) of UHE Cosmic Ray by using a trigger circuit[3] which produces trigger pulses when ever a minimum number of pulses fall within the time window of 2.5 μ S. We simulate a trigger circuit using VHDL to generate pulses for recording a genuine EAS event. Comparison is done with the exiting hardware so that the hardware implementation of the simulated circuit would be more effective for UHE cosmic ray detection in MINIARRAY Method.

[1] T.Bezboruah, K Boruah, P.K. Boruah, Proceedings Symposium on Advances in Nuclear and Allied instrumentation, Vol 1 (498). [2] Linsley J.(1983) Research Report UNML-6/20/83 [3]N.M.Saikia, P.K.Baruah,K.Boruah-in Proc.ICRC-29th Pune 05, Volume 8,pp81-84.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

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