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Future plan for observation of cosmic gamma rays in the 100 TeV energy region with the Tibet air shower array : simulation and sensitivity

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Abstract content

The Tibet air shower array, which has an effective area of 37,000 square meters and is located at 4300 m in altitude, has been observing air showers induced by cosmic rays with energies above a few TeV. We have a plan to add a large muon detector array to it for the purpose of increasing its sensitivity to cosmic gamma rays in the 100 TeV energy region by discriminating them from cosmic-ray hadrons. We have deduced an attainable sensitivity of the muon detector array using our Monte Carlo simulation. Gamma rays from the Crab Nebula with energies above 100 TeV are expected to be detectable within a year at a significance of more than 5 sigma if its flux does not have a cutoff up to 100 TeV. Comparison with the recent H.E.S.S. observation allows us to expect that approximately ten new sources emitting gamma rays in the 100 TeV energy region can be discovered in the northern sky. The possibility of detection of gamma rays with energies around 100 TeV from some known point sources in our field of view is also discussed.

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

Tibet AS-gamma collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 2 (OG part 1), pages 357-360

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