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The EM algorithm applied to the search of high energy neutrino sources.

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Abstract content

The detection of astrophysical sources of high energy neutrinos is one of the most interesting quests in modern astrophysics. Unlike gamma and X-ray observations, the low number of signal events expected in high energy neutrino telescopes, constrains significantly the discovery probability of the sources. New algorithms to disentangle clusters of small number events from the background events are required. In this contribution, we will explore the potentiality of the Expectation-Maximization algorithm to the search of point-like source with a generic Kilometre-Scale neutrino telescope located in the Mediterranean sea. The EM algorithm is a widely used algorithm in the clustering analysis. This method can also be applied to the search of nearby ultra-high energy cosmic rays sources from ground detection infrastructures. Complexity arising from the low statistics will be described as well as the results compared to the well-known binning technique applied in this kind of experiments and developed firstly by the MACRO collaboration.

If this papers is presented for a collaboration, please specify the 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. 4 (HE part 1), pages 809-812

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