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Coincident TeV Neutrino and Gamma Ray Observations

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Abstract content

The IceCube detector is already the world's largest neutrino detector and when completed in 2011, will be a cubic kilometer in volume. However, even under optimistic assumptions about neutrino emission, the potential neutrino signal in IceCube from AGN and GRBs may be small. The atmospheric neutrino background after cuts will result in 1-2 neutrinos/yr/km³/deg² above 1 TeV. For a three year observation of an AGN in the northern sky one could expect ~5 background events. Lacking other information about AGN emission in the TeV nearly 20 neutrino signal events would have to be observed in order to claim an unambiguous detection. The HAWC gamma ray detector would be a unique complement for IceCube. It will monitor the entire northern sky everyday for transients with fluxes less than 1 Crab in the TeV energy range. HAWC would detect stronger outbursts, such as have been observed for Mrk 501 and Mrk 421 within 10 minutes. It will also be a monitor for TeV emission from GRBs. By knowing when to look for TeV emission, IceCube could observe a neutrino signal with just 1-2 events. This talk will focus on the capability of HAWC as an all-sky TeV monitor and, in particular, its utility for neutrino detectors such as IceCube.

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

HAWC 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. 3 (OG part 2), pages 1221-1224

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