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Radio Detection of GZK Neutrinos - AURA status and plans

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Abstract content

The excellent radiofrequency transparency of cold polar ice, combined with the 'coherent' Cherenkov emission produced by neutrino-induced showers when viewed at macroscopic wavelengths, has spurred considerable interest in an ultimate, large-scale radiowave neutrino detector array. Detection of GZK neutrinos will require at least an order of magnitude improvement in the product of (livetime)x(Effective volume) over existing (RICE, ANITA, e.g. neutrino detection experiments. Correspondingly, the AURA (Askaryan Underice Radio Array) experimental effort seeks to take advantage of the opportunity presented by IceCube drilling through 2010 to establish the radiofrequency technology needed to achieve 100-1000 km^3 effective volumes. We discuss three test strings co-deployed with IceCube in 2006-07 which combine fast in-ice digitization with an efficient, multi-tiered trigger scheme.

Ultimately, augmentation of IceCube with large-scale (100 km^2 x 2 km deep) radio and acoustic arrays would extend the physics reach of IceCube into the EeV-ZeV regime and offer substantial technological redundancy.

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

IceCube 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 827-830

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