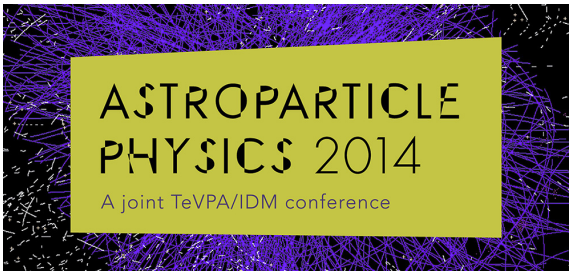

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Latest Results on Searches for Point and Extended Sources with Time Integrated and Time Dependent emissions of Neutrinos with the IceCube Neutrino Observatory

Tuesday, June 24, 2014 4:30 PM (20 minutes)

We have performed a variety of searches for neutrino emission from astrophysical sources using multiple years of IceCube data collected between April 2008 and May 2011 by the partially-completed IceCube detector, as well as the first year of data from the completed 86-string detector. Utilizing spatial, energy and time information, an unbinned maximum likelihood method is used to distinguish astrophysical signals from atmospheric backgrounds. We performed a generic search anywhere in the sky for individual point and spatially extended sources, as well as searches for catalogues of individual sources and stacked ensembles of similar sources. To enhance the discovery potential for sources with non-steady emission another set of searches was done including the neutrino arrival time information. An untriggered scan was done over separate years of IceCube data seeking to identify any high-energy neutrino events significantly clustered both in space and time. Then a search targeting a selection of flaring gamma ray sources observed by the Fermi experiment and other TeV telescopes for neutrino events coinciding with the gamma-ray light curves was carried out. In addition a search was performed for periodic emissions from a selected catalog of microquasars and binary systems with known periodicities from X-Ray, Gamma Ray and Radio observations. These analyses are sensitive to TeV–PeV energy neutrinos in the northern sky and PeV–EeV neutrinos in the southern sky. Limits on extraterrestrial neutrino fluxes are compared to model predictions. The expected performance with multiple years of data from the full IceCube detector is discussed.

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