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A shell like kilometer spaced array around Icecube

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Icecube neutrino detector traces energetic TeVs-PeVs neutrino signals by their cascades or by their tracks inside its kilometer icy cube volume. Cascades are mostly for electron or tau or neutral current, tracks for muons. Cascades show mostly poor directionality. Tracks are sharp in directionality. TeVs-PeVs muon tracks are either born inside, HESE, or outside Icecube. These more abundant trough-going upward muons have their interactions outside the Icecube mainly in dense rock around. Such kilometer long tracks offer much precise ideal neutrino astronomy. Moreover highest tens TeV or PeVs neutrinos are opaque to the Earth, arriving mainly upward and horizontally crossing short Earth cord. Therefore we considerfor this upgrade Icecube detector, a widest kilometers spaced concentric array rings around Icecube each ring a kilometer far from the other. To discover upward-horizontal kilometer muon tracks we neglect (and save) the denser Icecube array structures needed to detect cascades. Therefore we save the hundred meter distances from each vertical array, as volumetric dense present Icecube detectors. In a more simple configuration we suggest the widest building of a shell like spiral array, centered on Icecube, spaced nearly one kilometer each ring from next ring leading to largest array net able to trace most upward horizontal muon tracks neutrino Astronomy. Such wider (km) empty array volumes for the same array number, may at best amplify, almost quadratically, the observed mass volume, in comparision to a more dense cubic (hundred meter) dense full volumes. In a first approximation one may obtain in place of a cubic 10 kilometer Icecube a shell like spiral volume about 100 kilometer mass-volume detector.

Keywords

Icecube, Tracks, Muons, neutrino,cascades

Collaboration

other Collaboration

Subcategory

Theoretical Methods

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