

## The Variatiotn of Atmospheric neutrino flux due to the variation of atmosphere

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As the source of uncertainty in the calculation of atmospheric neutrino, uncertainties of primary cosmic ray spectrum, hadronic interaction model, geomagnetic cutoff, and effect of solar activity are often discussed. However, the atmospheric neutrino flux is also affected by the variation of the density structure of atmosphere in a similar amplitude to that by the solar activity. This fact implies that for the precise measurement of atmospheric neutrino fluxes, a long term observation is necessary and that to observe the effect of the solar activity in atmospheric neutrinos, the correction of according to the variation of density structure of atmosphere is necessary.

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