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Atmospheric neutrinos at high energy

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Neutrinos produced by cosmic-ray interactions in the Earth's atmosphere are a background in the search for neutrinos of astrophysical origin. In addition, they provide a beam that can be used for calibration and to study neutrino properties, such as oscillations. Several issues that arise in evaluating the atmospheric neutrino spectrum up to the PeV range will be addressed in this paper:

What is the level of production of prompt neutrinos from decay of charmed hadrons?

What is the effect of the steepening of the primary cosmic-ray spectrum at the knee and the energy dependence of the production of the parent mesons that decay to neutrinos?

To what extent is it possible to distinguish atmospheric neutrinos from astrophysical neutrinos, for example, by using a muon produced in the same cosmic-ray event as a veto?

Summary

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