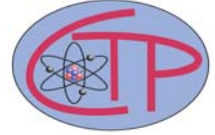




NEW YORK CITY COLLEGE OF TECHNOLOGY
Physics Department
Center for Theoretical Physics



Updating the Prompt Atmospheric Neutrino Background at IceCube

Presented by:

Jim Talbert

University College, Oxford University

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Abstract

I will present an updated prediction of the flux of neutrinos arising from the prompt decay of charmed hadrons formed in collisions of cosmic rays on the upper atmosphere. This 'prompt' flux of atmospheric neutrinos serves as a principal background that must be discriminated against at neutrino telescopes such as IceCube, whose primary mission is the detection of astrophysical neutrinos of similar energies. Our calculation is semi-analytic, employs NLO pQCD Monte-Carlo event generation and up-to-date parton distribution functions, and has been validated in detail with the recent LHCb charm production data, which cover a similar kinematical region. The calculation of the lepton fluxes is performed in the well-established framework of 'cascade' equations, which trace the (re)generation and evolution of nucleons, mesons, and leptons in the earth's atmosphere. Our results are consistent with former calculations, though provide a much more robust uncertainty estimate.