Abstract Submitted
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High Energy Atmospheric Neutrino Fluxes From a Realistic Primary Spectrum[1] FELIPE CAMPOS PENHA, HANS DEMBINSKI, THOMAS K. GAISSER, SERAP TILAV, Bartol Research Institute and Department of Physics and Astronomy, University of Delaware, Newark, DE 19716, USA — Atmospheric neutrino fluxes depend on the energy spectrum of primary nucleons entering the top of the atmosphere. Before the advent of *AMANDA* and the *IceCube Neutrino Observatory*, measurements of the neutrino fluxes were generally below $\sim 1\,\mathrm{TeV}$, a regime in which a simple energy power law sufficed to describe the primary spectrum. Now, *IceCube*'s muon neutrino data extends beyond 1 PeV, including a combination of neutrinos from astrophysical sources with background from atmospheric neutrinos. At such high energies, the steepening at the knee of the primary spectrum must be accounted for. Here, we describe a semi-analytical approach for calculating the atmospheric differential neutrino fluxes at high energies. The input is a realistic primary spectrum consisting of 4 populations with distinct energy cutoffs, each with up to 7 representative nuclei, where the parameters were extracted from a global fit [*T. K. Gaisser, T. Stanev, and S. Tilav (2013)*]. We show the effect of each component on the atmospheric neutrino spectra, above 10 TeV. The resulting features follow directly from recent air shower measurements included in the fit.

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