

Abstract Submitted
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All Particle Cosmic Ray Spectrum from Compiled Direct Measurements of Elemental Spectra DEVEN BOWMAN, RACHEL SCRANDIS, EUN-SUK SEO, University of Maryland, College Park — The all particle spectrum of cosmic rays presents two distinct features: the ‘knee’, in which the spectrum hardens at about $3 * 10^{15}$ eV, and the ‘ankle’, at about 10^{18} eV, where the slope changes again. Ground based experiments have been able to collect data on both of these spectral features, but their underlying causes have yet to be determined. Space based experiments provide the ability to measure the composition of cosmic ray spectra, and cover energies ranging several magnitudes below the knee. Recent experiments such as AMS, NUCLEON, CREAM, DAMPE, and CALET have measured primary cosmic ray spectra up to $\sim 10^{14}$ eV, allowing for comparison between the lower energy space based experiments and higher energy ground based experiments. This data was compiled, fit with power laws, and extended to $> 10^{15}$ eV to calculate the all particle spectrum and average logarithmic atomic mass numbers. They were then compared to past ground based measurements. The extended all particle spectrum was used to calculate the expected atmospheric neutrino fluxes by utilizing the Matrix Cascade Equations toolkit. This flux was compared to IceCube data and expected atmospheric neutrino fluxes from other all particle cosmic ray spectra.

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