

Abstract Submitted  
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**Uncertainties in Atmospheric Muon-Neutrino Fluxes Arising from Cosmic-Ray Primaries<sup>1</sup>** SALVATORE DAVIDE PORZIO, JUSTIN EVANS, STEFAN SOLDNER-REMBOLD, STEVEN WREN, The University of Manchester — We present an updated calculation of the atmospheric muon-neutrino flux uncertainties arising from cosmic-ray primaries, including for the first time the information from recent measurements of the cosmic-ray primaries. We apply a statistical technique that allows the determination of correlations between the parameters of the GSHL primary-flux parametrisation, and the incorporation of these correlations into the uncertainty on the muon-neutrino flux. Given the unexpected hardening of the spectrum of primaries above 100 GeV observed in recent measurements, we propose an alternative parametrisation and discuss its impact on the neutrino flux uncertainties. We obtain an uncertainty on the primary cosmic-ray component of  $\approx (5-10)\%$ , depending on energy, which is about a factor of two smaller than for the previous fit. The hadron production uncertainty is added in quadrature to obtain the total uncertainty on the neutrino flux.

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