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Upgrade of Honda atmospheric neutrino flux calculation with implementing recent hadron interaction measurements

We will present the strategy to refurbish a simulation code ATMNC developed by M. Honda which provides an accurate atmospheric neutrino ($\text{atm-}\nu$) flux prediction and has greatly contributed to the neutrino experimental physics including Super-Kamiokande (SK).

The dominant uncertainty of the Honda's calculation arises from insufficient understanding of the hadron interactions inside air showers. Many precise measurements for hadron production using accelerator beams have been performed or planned. Our goal is to incorporate these accelerator-data-driven modifications into ATMNC. This allows the systematic uncertainty of $\text{atm-}\nu$ oscillation analysis to be evaluated based on the accelerator measurements. In addition, the accelerator measurements provide kaon production data that plays important role in high energy flux.

In this poster, we will show how the accelerator data are integrate into ATMNC, and evaluate the impact on the flux and its uncertainty.

Mini-abstract

The upgrade strategy for atmospheric neutrino flux calculation developed by M.Honda is discussed.

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