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Beam Flux Fits and Systematics in MINOS+

MINOS+ is a long baseline neutrino oscillation experiment that utilizes the Fermilab NuMI (Neutrinos at the Main Injector) neutrino beam. Historically, MINOS operated in the lowest available beam energy configuration; however, in the new MINOS+ era, a medium energy neutrino beam spectrum is being produced. An understanding of the beam flux and systematic uncertainties is essential to the MINOS+ oscillation analyses, in particular the search for sterile neutrino generations. The impact of the beam systematics has now been studied in this new medium-energy configuration. Building upon the beam fitting framework used in MINOS, we have developed a beam fit for MINOS+ that tunes the simulation to the Near Detector data. We present our study of the predominant systematics, the first results of the beam fit, and the steps being taken to evolve the fitting framework to handle sterile neutrino generations.

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