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Flux Extrapolation Uncertainties from Tokai to Hyper-K

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Preliminary sensitivity studies for a CP violation measurement with a Tokai-to-HyperK neutrino beam suggest that 2% systematic errors are required to remain statistics limited. We investigate the uncertainty on the flux extrapolation from potential near detector sites in Tokai, including the current ND280 site and potential sites out to 2 km from the neutrino beam production point. We evaluate the neutrino flux uncertainties using current uncertainties on hadron production data from NA61/SHINE used by T2K, and using the expected ultimate uncertainties from NA61/SHINE data. We compare the results to the 2% systematic error requirement and consider the suitability of existing or potential near detector sites.

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