Measurement of $\nu_\mu$ and $\nu_e$ Events in an Off-Axis Neutrino Beam

ZELIMIR DJURCIC$^1$, Columbia University — The purpose of the MiniBooNE detector at Fermilab is to measure neutrinos from the Booster beamline. In the same time the MiniBooNE detector observes off-axis neutrinos from the NuMI/Minos beamline. These events are used to measure pion and kaon components of the NuMI beam. The data sample provide an important complementary analysis of the neutrino spectrum since the energy and distance is similar to the Fermilab Booster beam. We analyzed charged current quasi-elastic ($\nu_\mu n \rightarrow \mu^- p$) events that dominate at energies below 2 GeV. This sample is used to demonstrate our understanding of the beam. In the next step an enriched $\nu_e$ event sample ($\nu_e n \rightarrow e^- p$) was isolated. The NuMI events are dominated by intrinsic $\nu_e$ in low neutrino energy region and therefore subject to different systematics when compared to the Booster neutrinos. The results of the analyses will be presented.

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