Improvements in the NuMI Flux Prediction at MINERvA. DIPAK RIMAL, Univ of Florida - Gainesville, MINERVA COLLABORATION — MINERvA uses its state-of-the art infrastructure to predict neutrino flux from Fermilab's NuMI beamline. The infrastructure incorporates world knowledge of the hadron production and interaction measurements to normalize the hadron production predicted by GEANT4.The predicted spectrum for the NuMI on-axis flux for low recoil events in the Medium Energy (ME) beam appears to be shifted by a fraction of a GeV. Since the cross section for low recoil events is nearly independent of the incoming neutrino energy, a discrepancy in the shape of the low recoil spectrum suggests a problem with flux prediction rather than a cross-section problem. A similar discrepancy is seen in the antineutrino beam and by MINOS+, and is not seen in a data set where the horns are turned off. This suggests that it is a focusing rather than a hadron production mismodeling. In order to produce a more accurate flux prediction, MINERvA has developed a strategy to fit the neutrino data-simulation discrepancy for a number of possible focusing system effects: alignment, horn current, and primary beam parameters. The fit takes into account the fact that different alignment offsets will affect neutrino energy spectra differently in various transverse regions of the MINERvA detector. This talk will focus on different aspects of this flux fit and the systematic effects.

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