Neutrino oscillation analysis of IMB upward-going muon data with improved interaction model

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Abstract

An earlier analysis of the ratio of stopping to through-going neutrino-induced upward muons in IMB excluded neutrino oscillations in the region now favored by the Super-Kamiokande experiment. It has been suggested that the simple deep-inelastic cross-section model used in this analysis underestimates the predicted rate of upward stopping muons, and hence may mask any possible deficit caused by neutrino oscillation. The original IMB data are compared with the predictions of a more realistic cross-section model (taking into account exclusive quasi-elastic and resonant reaction channels) to determine whether they are, in fact, inconsistent with the Super-Kamiokande results.