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Kaon production in the charged-current neutrino interactions in the T2K experiment

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Kaon production cross sections provide a crucial constraint on K^+ production by atmospheric neutrinos in proton decay searches. Current neutrino-nucleus event generators largely rely on theoretical models for the descriptions of backgrounds due to kaons and need to be verified by measurements. The event rate for these processes is low as compared to pion production channels because of Cabibbo suppression and the relatively large kaon mass. Recent measurements with large statistics for kaon production were reported by the Minerva experiment at higher neutrino energies. T2K measures this process at lower energies close to the threshold for strangeness production where existing measurements from bubble chambers have limited statistics. This search for charged-current neutrino interactions that produce a K^+ in the final state was performed in the ND280 Fine Grained Detector (FGD), a scintillator-based tracking calorimeter within the T2K Near detector. Events with a K^+ are identified in T2K by studying the energy deposition of tracks in the Time Projection Chamber. This poster will show the latest results for the selected kaon sample together with the method used to estimate the backgrounds and evaluate a one-bin cross section in the restricted phase-space.

In-person participation

Yes

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