

Q2 discrepancies : data confronts theory

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The MiniBooNE experiment has collected what is currently the world's largest sample of muon neutrino charged current single charged pion (CC1pi+) interactions, roughly 46,000 events. The purity of the CC1pi+ sample is 87% making this the purest event sample observed in the MiniBooNE detector. The average energy of neutrinos producing CC1pi+ interactions in MiniBooNE is about 1 GeV, therefore the study of these events can provide insight into both resonant and coherent pion production processes. In this talk, we will discuss the long-standing discrepancy in four-momentum transfer observed between CC1pi+ data and existing predictions. Several attempts to address this problem will be presented. Specifically, the Rein-Sehgal model has been extended to include muon mass terms for both resonant and coherent production. Using calculations from recent papers, an updated form for the vector form factor has also been adopted. The results of this improved description of CC1pi+ production will be compared to the high statistics MiniBooNE CC1pi+ data and to several existing parametrisations of the axial vector form factor. Preliminary results for the value of the axial mass in resonant single pion production will be presented.

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