Recent Results of the Relativistic Green's Function Model in Quasielastic Neutrino and Antineutrino Scattering

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The analysis of charged-current and neutral-current quasielastic neutrino and antineutrino-nucleus scattering cross sections recently measured by different Collaborations requires relativistic theoretical descriptions also accounting for the role of final-state interactions (FSI).

In the relativistic Green's function (RGF) model FSI are described by a complex optical potential where the imaginary part recovers the contribution of final-state channels which are not included in other models based on the impulse approximation and usually adopted for quasielastic lepton-nucleus scattering. Therefore, with the use of a complex optical potential, the RGF model includes all the allowed final-state channels and not only direct one-nucleon emission processes. The relevance of contributions other than direct one-nucleon emission, as well as the differences between the results of the RGF and of other models, depend on kinematics. The RGF results are also sensitive to the choice of the phenomenological relativistic optical potential adopted in the calculations.

The RGF model has been extensively and successfully tested in comparison with electron scattering data. The model has then been extended to neutrino scattering. In this contribution the RGF results are compared with the data recently published by the MiniBooNE and MINERνA Collaborations. The model is in general able to give a good description of the experimental data.