Interaction of Electrons and Neutrinos with Nuclei

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Electron-nucleus scattering in the quasielastic regime has been analyzed over years providing a large amount of precise data for cross sections as well as for the separate response functions. These data lead to strong constraints to any theoretical model. Moreover, electron scattering data may also provide essential information in understanding neutrino reactions. This is the basis of the SuperScaling Approach (SuSA): the scaling behavior exhibited by electron scattering data and its applicability to neutrino reactions. On the other hand, a different approach based on a microscopic description of the nuclear dynamics using relativistic mean field theory has been also considered and applied to both processes: electrons and neutrinos. The two models are used to describe recent data for neutrinos measured by the MiniBooNE Collaboration at different kinematics.