Interaction of Electrons and Neutrinos with Nuclei: The Relativistic Mean Field

J.A. Caballero

Departamento de Física Atómica, Molecular y Nuclear, Universidad de Sevilla, 41080 Sevilla, Spain

We analyze the interaction of electrons and neutrinos with nuclei at intermediate-to-high energies. We make use of a fully relativistic calculation based on the Relativistic Mean Field (RMF). The phenomenon of scaling and/or superscaling is also investigated at depth, showing its validity against electron scattering data. Based on these results and the predictions provided by the RMF we have developed a new model, denoted as SuSAv2, that incorporates not only the quasielastic (QE) domain but also inelastic processes. The model has shown its capability to reproduce (e, e') data at very different kinematics and for the whole energy spectrum, and it has been applied to the description of neutrino scattering reactions. Results are very promising with a high accordance with data for several experiments. The role of Meson Exchange Currents (MEC) within the 2p-2h sector has also been proved to be essential.