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Implementation of the Spectral Function in GENIE

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The neutrino community is at an exciting time where new data with higher precision than ever is challenging the empirically based models which have been developed over the last several decades. Understanding this new data requires state of the art theory, leveraging collaboration between the nuclear physics, electron scattering, and neutrino community. One such state of the art model, the Spectral Function + Extended Factorization scheme, provides a unified approach to lepton-nucleus scattering and can incorporate the entire spectrum of interaction mechanisms from Quasi-elastic to Deep Inelastic scattering. Additionally, Spectral Functions derived from Quantum Monte Carlo methods allow for a concrete estimation of the theoretical error inherent to the factorization scheme.

In this talk I will summarize efforts to include the SF formalism in the GENIE neutrino event generator, starting with Quasi-elastic scattering and plans for other interaction mechanisms in the future. Validation against semi-exclusive electron and neutrino scattering data will be included highlighting the strengths of the SF approach relative to other models.

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