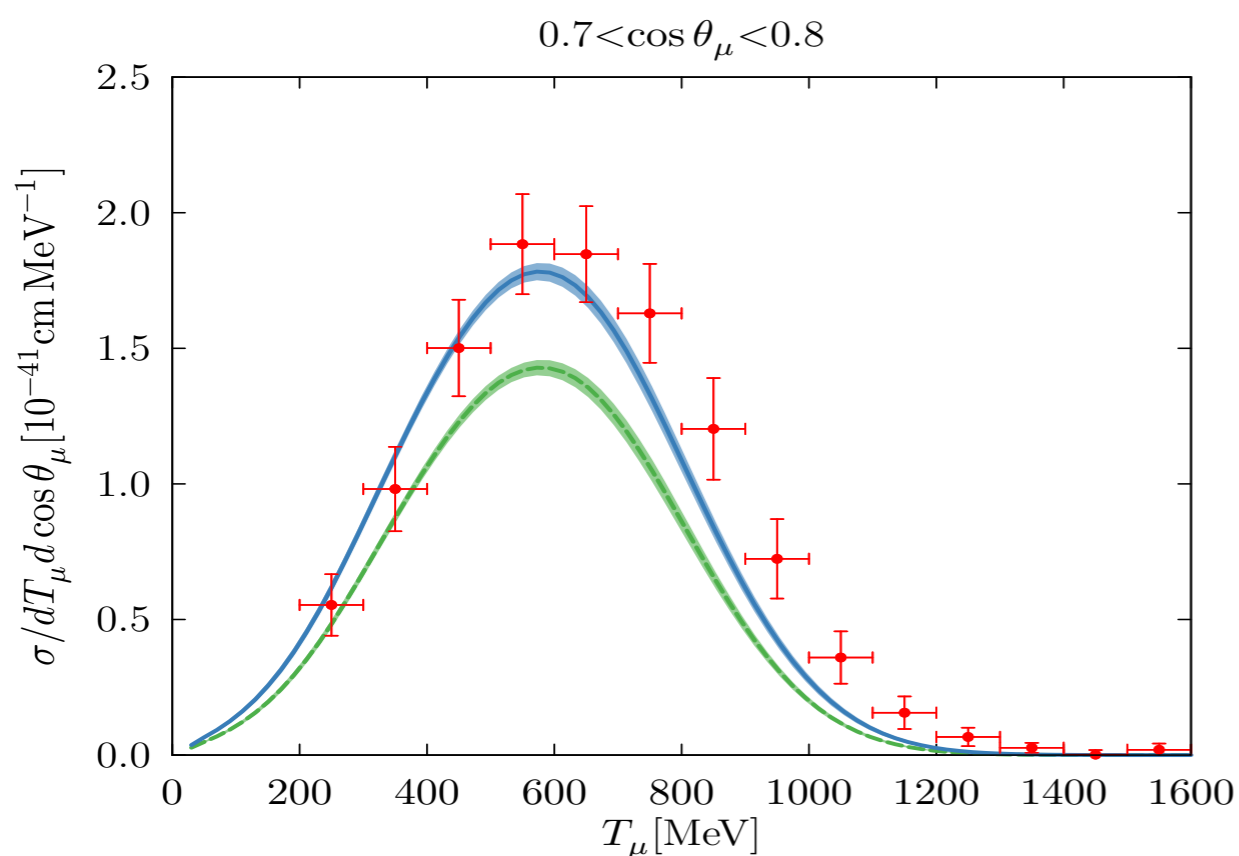


Objectives

- Carry out an ab initio calculation of the neutrino and anti-neutrino flux-folded inclusive cross sections, measured on ^{12}C by the MiniBooNE and T2K collaborations in the quasi-elastic regime.
- Study the sensitivity of the inclusive cross section to the parametrization of the single-nucleon axial form factor, including a very recent lattice QCD determination.



Neutrino scattering on ^{12}C with one (green) and one plus two-body currents (blue) compared to MiniBooNE experimental data

Impact

- The success of the domestic and international accelerator-neutrino program relies on accurate estimates of neutrino-nucleus cross sections with quantified uncertainties;
- We employ realistic two- and three-nucleon interactions and nuclear electroweak currents with one- and two-nucleon terms that are consistent with these interactions;
- Numerically exact quantum Monte Carlo methods are utilized to compute the nuclear weak response functions;
- Our results are in good agreement with MiniBooNE and T2K data, yielding a consistent picture of nuclei and their electroweak properties across a wide regime of energy and momenta;

Accomplishments

- A. Lovato, J. Carlson, S. Gandolfi, N. Rocco, and R. Schiavilla, Phys. Rev. X 10, 031068 (2020)