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## Neutrino-nucleon inclusive scattering cross sections on the lattice

*Wednesday, 28 July 2021 22:00 (15 minutes)*

We compute the inclusive neutrino-nucleon scattering cross sections from the first principles of QCD. This is highly relevant to the recent and future  $\nu - N$  scattering experiments, whose energy regime is excessively low for the perturbative analysis to hold. We use a technique recently proposed

to treat the inclusive contributions on the lattice. We compute the forward Compton-scattering amplitude on the lattice where all intermediate states contribute.

Total cross section is then constructed by multiplying the phase space factor and integrating over the energy and momentum of final states. By promoting the phase space factor to an operator, the energy integral and the sum over intermediate states is represented by a series of correlators in Chebyshev basis.

In this talk we conduct a series of tests showing the validity of the methodology, tracking the changes in the shape of smeared kernel functions according to the smearing width and to the order of Chebyshev approximation, and check the consistency with phenomenological analyses.

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