Contribution ID: **42** Type: **Oral**

Monte Carlo methods for global QCD analysis of parton distributions

Thursday, November 7, 2019 11:15 AM (15 minutes)

Extracting information about the quark and gluon (or parton) structure of the nucleon from high-energy scattering data is a classic example of the inverse problem: the experimental cross sections are given by convolutions of the parton probability distributions with process-dependent hard coefficients that are perturbatively calculable from QCD. While most analyses in the past have been based on the maximum likelihood approach, it is becoming evident that Bayesian likelihood methods using Monte Carlo (MC) sampling techniques are increasingly needed to thoroughly explore the parameter space associated with the quantum probability distributions. This talk will review the recent developments in the application of MC techniques to global QCD analyses, which are leading to a paradigm shift in the phenomenological study of partonic structure of the nucleon, including the first simultaneous global analysis of collinear parton distributions and parton to hadron fragmentation functions. Future applications to the study of the 3-dimensional structure of the nucleon, in terms of transverse momentum dependent parton distributions, will be outlined.

Consider for promotion

Yes

Primary author: Dr MELNITCHOUK, Wally (Jefferson Lab)

Co-authors: Dr SATO, Nobuo (JeffersonLab); Dr ANDRES, Carlota (Jefferson Lab); Dr ETHIER, Jacob (NIKHEF)

Presenter: Dr MELNITCHOUK, Wally (Jefferson Lab)

Session Classification: Track 6 – Physics Analysis

Track Classification: Track 6 – Physics Analysis