Contribution ID: **63** Type: **Invited talk**

Abel Tomography: Charge and Energy-Momentum Tensor Densities of the Nucleon

Tuesday 30 November 2021 10:50 (30 minutes)

Usual three-dimensional (3D) densities of the nucleon are only meaningful quasi-probabilistically through the Wigner distributions. Taking the infinite-momentum frame, where the nucleon is on the light cone, we can define two-dimensional (2D) distributions of the nucleon, which contain the quantum-mechanically probabilistic meaning. The Abel transformations, on the other hand, allow one to derive the 2D distributions of the nucleon directly from the 3D ones. We will address current investigations on the charge and energy-momentum-tensor (EMT) distributions of the nucleon in this talk, based on the Abel transformations. We first explain how the form of the 2D transverse charge distribution of the polarized nucleon changes as the longitudinal momentum of the nucleon grows from the rest frame to the infinite-momentum frame. Then, we show that the 2D transverse charge and magnetization densities of the proton and neutron can be derived directly from the 3D ones by employing the Abel transformations. We also demonstrate that the EMT densities, i.e., energy, spin, pressure, and shear-force densities in the transverse plane can be obtained by the Abel transforms of the corresponding 3D densities.

Primary authors: KIM, Hyun-Chul (Inha University); Mr KIM, June-Young (Ruhr-University Bochum)

Presenter: KIM, Hyun-Chul (Inha University)

Session Classification: Plenary Session