Contribution ID: **357**   Type: **Oral presentation**

Lattice QCD calculation of the proton electromagnetic polarizability

Tuesday, 27 July 2021 05:30 (15 minutes)

The electromagnetic polarizability is an important property of nucleon. It describes the response of a nucleon when it is placed in an external electric or magnetic field. The polarizability can be extracted from the real or virtual Compton scattering process $\gamma N \rightarrow \gamma N$. We develop a method to calculate the the Compton scattering matrix elements of nucleon from a 4-point correlation function on the lattice. Then we show that the electromagnetic polarizability can be extracted from the lattice data subsequently.

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Session Classification: Hadron Structure

Track Classification: Hadron Structure