Contribution ID: **27** Type: **not specified**

Quark mass dependence of photon pion scattering

Thursday, 15 March 2018 12:00 (30 minutes)

Usually the simulation of scattering processes in lattice QCD is carried out at unphysical high values of the quark masses [1]. Hence, a method to extrapolate data obtained in lattice calculations to physical masses is needed to allow for comparison between theory and experiment. To obtain a sound extrapolation, dispersion relations and chiral perturbation theory can be invoked. While a simple combined approach known as the inverse amplitude method allows for a successful extrapolation of $\pi\pi \to \pi\pi$ data [2], a more complicated framework is needed for inelastic processes such as $\gamma\pi \to \pi\pi$. By extending the dispersive description derived in Ref. [3], the extrapolation can be performed for $\gamma\pi \to \pi\pi$ both for on-shell as well as virtual photons. This particular process is interesting due to both its contribution to the anomalous magnetic moment of the muon and its connection to the axial anomaly.

References:
- [1] Briceno et al.: https://arxiv.org/abs/1507.06622
- [2] Bolton, Briceno, Wilson: https://arxiv.org/abs/1507.07928
- [3] Hoferichter, Kubis, Sakkas: https://arxiv.org/abs/1210.6793

Summary

We investigate the quark mass dependence of the process $\gamma\pi \to \pi\pi$ using dispersion relations and chiral perturbation theory.

Primary author: Mr NIEHUS, Malwin (HISKP, University of Bonn)

Co-authors: Prof. KUBIS, Bastian (University of Bonn); Dr HOFERICHTER, Martin (University of Washington)

Presenter: Mr NIEHUS, Malwin (HISKP, University of Bonn)

Session Classification: Amplitude analysis and Light Quarks