Contribution ID: **250** Type: **not specified**

Electromagnetic transition form factor and radiative corrections in decays of neutral pions

Monday 29 August 2016 19:30 (20 minutes)

In this talk we present the Two-hadron saturation (THS) scenario for the PVV correlator and apply it to two important processes of the low energy hadron physics: the Dalitz decay of π^0 and $\pi^0 \to e^+e^-$. We briefly summarize experimental and theoretical results on the rare decay $\pi^0 \to e^+e^-$. The notorious $3.3\,\sigma$ discrepancy between the SM prediction and the experimental value provided by KTeV collaboration is discussed in the view of a complete set of NLO QED radiative corrections. The important contribution of analytical two-loop QED corrections together with the bremsstrahlung contribution beyond the soft-photon approximation are reviewed. Using the leading logarithm approximation, the possible contribution of QCD corrections is estimated. The discrepancy under discussion then reduces down to $1.8\,\sigma$. The obtained results can be also used in a theoretical calculation of the hadronic light-by-light scattering contribution to the $g-2$ type experiments.

Summary

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Session Classification: Section B

Track Classification: Section B: Light Quarks