technische universität dortmund

SEMINAR TEILCHENPHYSIK

Thema

Application of light-cone sum rules (LCSRs) to $D_{(s)} \rightarrow P\ell^+\ell^-$ decays

Abstract

 $D^+ \rightarrow \pi^+ \ell^+ \ell^-$ decays are of much interest from the point of view of GIM cancellation and potential new sources of the FCNC $c \rightarrow u$ transitions. The hadronic amplitude of this decay is dominated by the combination of weak annihilation with the emission of a virtual photon which are purely long-distance effects.

In this talk, I will discuss a new method to analyse these decays, combining QCD light-cone sum rules (LCSRs) with hadronic dispersion relations. This method allows us to determine relative strong phases of the ρ -, ω - and ϕ -meson resonances and to estimate of the contributions of heavier hadronic states. The final results for $D^+ \rightarrow \pi^+ \ell^+ \ell^-$ width are obtained to be not much smaller than the current upper bound measured by LHCb collaboration. In the later part of my talk, I will discuss the relations of these decays to other Cabibbo favoured and Cabibbo suppressed modes using U-spin symmetry. Finally, I present results for Cabibbo-favoured modes, $D_s^+ \rightarrow \pi^+ \ell^+ \ell^-$ and $D^0 \rightarrow \overline{K}^0 \ell^+ \ell^-$, which proceed via the same weak annihilation mechanism as a byproduct of our analysis.

Vortragender

Dr. Anshika Bansal Universität Siegen

Ort

CP-03-123

Zeit

Donnerstag, 10.07.2025 16:00 – 17:00 Uhr

im Auftrag:

Dr. Maik Becker