T 29: Flavourphysik (Theorie)

Zeit: Montag 16:45–18:30   Raum: P6

T 29.1 Mo 16:45 P6

Heavy to light form factors: new results from LCSR — •Christian Hambrock — Universität Siegen

Sufficient control of transition form factors is a vital ingredient for the precision flavor programs including the nearer term searches at the Large Hadron Collider (LHC) and the forthcoming Belle II experiment. Improvement on the theoretical side is necessary to keep up with the increasing precision of nowadays experiments. In this talk the calculation and extraction from data of heavy to light transition form factors will be presented.

T 29.2 Mo 17:00 P6

The B-Meson Distribution Amplitude and its "Dual" — •Thorsten Feldmann[1], Guido Bell[2], Björn Lange[1], Yu-Ming Wang[3,4], and Matthew Yip[5] — [1]Theoretische Physik 1, Universität Siegen — [2]Rudolf Peierls Centre for Theoretical Physics, Univ. Oxford — [3]Institut für Theoretische Physik E, RWTH Aachen — [4]Physik Department, TU München — [5]IPPP, Univ. Durham

Light-cone distribution amplitudes (LCDAs) for B-mesons in heavy-quark effective theory (HQET) provide one of the essential non-perturbative inputs entering QCD factorization theorems for exclusive B decays. In this talk we show how to derive the eigenfunctions of the Lange-Neubert evolution equation which governs the behaviour of the B-meson LCDAs under a change of renormalization scale. The spectrum of the LCDA with respect to these eigenfunctions defines a "dual" function which renormalizes multiplicatively. In terms of these dual functions, renormalization-group improved factorization formulas take a very simple form. We also report on how to implement perturbative constraints from the operator product expansion in HQET within our new formalism.

T 29.3 Mo 17:15 P6

η, η' distribution amplitudes and form factors in QCD — Shahin Agaev[1], Vladimir Braun[2], •Nils Offen[2], Florian Porkert[2], and Andras Schäfer[2] — [1]Baku State University — [2]University of Regensburg

We calculated mass and anomaly corrections to the η and η' distribution amplitudes. These results are used to calculate the η, η' to $\gamma\gamma^*$ form factors at next to leading order including singlett contributions. Issues of factorisation including mass corrections will be discussed as well as experimental data.

T 29.4 Mo 17:30 P6

Two-loop correction to the decay $B \to D\pi$ — •Susanne Kränkl and Tobias Huber — Universität Siegen

The rich amount of B decays yield a broad spectrum of observables for investigating the flavour structure of the Standard Model. The theory description of various of these observables is based on QCD factorization, a model independent framework that exploits the structure of a decay amplitude in the heavy-mass limit. Two-loop corrections to certain non-leptonic B decay provide a further test of this framework. In this talk we present the result for the hard scattering kernel to the decay $\bar{B}^0 \to D^+\pi^-$ to two-loop accuracy. The calculation was performed by applying commonly used multi-loop techniques like Laporta's reduction to master integrals and Mellin Barnes representations and differential equations for evaluating the latter.

T 29.5 Mo 17:45 P6

Lorentz violation in weak decays — •Kimberley Keri Vos, Hans W. Wilschut, and Rob G.E. Timmermans — Univeristy of Groningen, the Netherlands

The unification of the standard model of particle physics and general relativity at high energies allows for the possibility of Lorentz violation. Traces of Lorentz violation are detectable in low-energy experiments. We investigate Lorentz violation in weak decays by using a recently developed framework in which the W-boson propagator is modified by a general Lorentz-violating tensor. We give an overview of the efforts in weak decays and present the first direct limits on Lorentz violation. We analyse the recent KLOE results on the directional dependence of the lifetime of neutral kaons. Finally we discuss the possibilities to further constrain Lorentz violation in nonleptonic decays, taking the KLOE data as an example.

T 29.6 Mo 18:00 P6

Strong couplings from Light-cone sum rules — Alexander Khodjamirian[1], •Patrick Gelhausen[1], Senti Imsong[1], and Yu-Ming Wang[2] — [1]Universität Siegen — [2]TU München

QCD Light-cone sum rules (LCSR) proved to be a reliable QCD based tool for the determination of form factors of heavy-to-light transitions like $B(D) \to \pi$. We revisit the LCSR for $B^*B\pi$ and $D^*D\pi$ strong couplings accessible via the same correlation function, employing the double dispersion relations. These sum rules are considerably improved by additional radiative corrections, updates of higher twist contributions and input parameters. We also probed various versions of double dispersion relations. The LCSRs were extended to strong couplings of heavy-light mesons containing a strange quark.

T 29.7 Mo 18:15 P6

Renormalization-group flow of flavour invariants — Thorsten Feldmann, Thomas Mannel, and •Steffen Schwertfeger — Universität Siegen, Deutschland

The entries of the quark Yukawa matrices in the Standard Model (SM) obey renormalization-group equations (RGEs). For a basis-independent formulation, it is convenient to consider flavour invariants which can be build from traces of products of the up- and down-quark Yukawa matrices.

In this talk, we discuss the general form of the RGEs in terms of these flavour invariants and show how the RG flow in the invariant space can be visualized. We pay particular attention to regions in the invariant space where certain residual flavour symmetries of the SM Yukaw sector can emerge.