

Project 3: Light-Cone Sum Rules in QCD and Effective theories

(Status Report)

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QFET Workshop, Siegen, December 8, 2014

Recent Publications related to P3

- P. Gelhausen, AK, A. A. Pivovarov, D. Rosenthal,
“Radial excitations of heavy-light mesons from QCD sum rules,”
arXiv:1404.5891 [hep-ph], published in EPJ C

- I. S. Imson, A. Khodjamirian, T. Mannel and D. van Dyk,
“Extrapolation and unitarity bounds for the $B \rightarrow \pi$ form factor,”
arXiv:1409.7816 [hep-ph], submitted in JHEP
see talk by Danny van Dyk

Current activities

- Ch. Hambrock, AK,
" Form factors for $B \rightarrow \pi\pi\ell\nu_\ell$ with small 2π -mass from LCSR's "
in progress, first results, see talk by Christian Hambrock
- AK, P. Gelhausen, S. Imsong,
N. Offen (Uni.Regensburg), Yu-M. Wang (TUM)
" LCSR for strong couplings $B^* B\pi$ and $D^* D\pi$ revisited",
in progress, NLO twist-3 calculation partly finished, checks and numerical analysis ahead
- Ch. Hambrock, AK, A. Rusov (Uni.Yaroslavl) " $B \rightarrow \pi\ell\ell$ rate and CP-asymmetry at large hadronic recoil"
Nonlocal effects from QCDF and LCSR combined with dispersion relation (partly P4)
- planned: D. van Dyk, C. Hambrock, AK, J. Virto
Gluon radiative corrections to the LCSR in HQET for $B \rightarrow K^{(*)}$
form factors, *diagram calculation started*

People involved in P3

- **PI's:**

Bjorn Lange, Thorsten Feldmann, AK, Thomas Mannel, Alexei Pivovarov

- **postdocs:**

Christian Hambrock (P3), Danny van Dyk

Senti Imsong

(after 1.10.2014 moved to Ben Gurion Uni., Israel)

- **PhD students:**

Patrick Gelhausen (P3)

(planned PhD thesis in first half of 2015)

Alexey Rusov (DAAD fellow from Yaroslavl Uni., Russia)

in Siegen from October 2014 till end of March 2015

- **new PhD and Master students** are welcome !

P3 work programm vs results

works: ✓ - published, ⊙ - in preparation ~ planned in 2015

Parameters and improvements for LCSRs ✓✓✓ ⊙ ~

B -Meson Distribution Amplitudes ✓✓

$B \rightarrow \pi\pi, K\pi$ form factors ⊙ ~

Hadronic Matrix Elements
for Exclusive FCNC Decays ⊙ ~

—————(planned mainly for the second half of QFET)

Heavy-to-light Baryon Form Factors

Light-Cone Sum Rules in SCET