Flavorful Ways to New Physics

Report of Contributions

https://indico.kit.edu/e/flavor

Contribution ID: **0** Type: **not specified**

Search for CP violation in D0->pi-pi+pi0 decays at LHCb

Thursday, October 30, 2014 11:30 AM (20 minutes)

The LHCb experiment has recorded the world's largest sample of charmed meson decays. This contribution will present a new measurement involving for the first time a decay into a final state containing a neutral pion. The search for CP violation exploits a novel model-independent, unbinned technique to assign a p-value for the no CP violation hypothesis. With a data sample size exceeding that of previous measurements by almost an order of magnitude a significant step in sensitivity is expected.

Author: Mr CHEN, Shanzhen (University of Manchester)

Presenter: Mr CHEN, Shanzhen (University of Manchester)

Session Classification: Young Investigator Talks

Contribution ID: **1** Type: **not specified**

Measuring Semileptonic Asymmetries in LHCb

Tuesday, October 28, 2014 4:30 PM (20 minutes)

The CP-violating flavour-specific asymmetry in neutral B mesons provides a method for testing the Standard Model. The measurements from the D0 experiment yield values of this asymmetry that disagree with the Standard Model, most recently at a level of 3.6 sigma. In this contribution, I will discuss the latest LHCb measurements in this sector for this asymmetry both from B0 mesons (asld) and B0s mesons (asls). Using their 2011 dataset, corresponding to an integrated luminosity of 1.0 fb-1 obtained in 2011, LHCb measured a value of asls = (-0.06 ± 0.50 (stat) ± 0.36 (syst))%, which is the most precise value of asls to date. Also, a new measurement on asld will be presented, based on the full LHC run-1 dataset.

Author: KLAVER, Suzanne (University of Manchester)

Presenter: KLAVER, Suzanne (University of Manchester)

Session Classification: Young Investigator Talks

Contribution ID: **2** Type: **not specified**

Lepton Flavor Violation in the SM with general Dimension-6 Operators

Friday, October 31, 2014 12:30 PM (20 minutes)

I will talk about lepton flavor observables in the charged lepton sector in the general extension of the Standard Model, where possible New Physics effects are parametrized by the dimension-5 and -6 operators constructed from the SM fields. I will discuss the radiative lepton flavor violating decays $\ell_i \to \ell_j \gamma$ as well as closely related charged lepton electric dipole moment and anomalous magnetic moments. We will also discuss the three body charged lepton flavor violating decay at the tree level and the Z^0 decays into pair of leptons of different flavors.

Author: Ms NAJJARI, Saereh (University of Warsaw)

Co-authors: Dr CRIVELLIN, Andreas (University of Bern); Prof. ROSIEK, Janusz (University of Warsaw)

Presenter: Ms NAJJARI, Saereh (University of Warsaw)

Session Classification: Young Investigator Talks

Contribution ID: **3** Type: **not specified**

Penguin Pollution in B^0 -> J/psi K^0 and B_s -> J/psi phi Decays

Tuesday, October 28, 2014 4:50 PM (20 minutes)

The size of the penguin pollution from the u-quark loop is under debate
for many years, and this issue must be settled when future precise data
on the famous mixing-induced CP asymmetries will be analysed to measure
sin(2*beta) or beta_s. We have caluclated the penguin pollution from first principles, using methods of soft-collinear factorisation. (Earlier attempts to do such a calculation for the B-> J/psi K_S branching ratio around 12 years ago had failed. The situation for the penguin pollution, however, is different.)

Author: Mr FRINGS, Philipp (Institute for Theoretical Particle Physics (TTP))

Presenter: Mr FRINGS, Philipp (Institute for Theoretical Particle Physics (TTP))

Session Classification: Young Investigator Talks

Contribution ID: **4** Type: **not specified**

Flavoured Dark Matter Beyond Minimal Flavour Violation

Wednesday, October 29, 2014 11:30 AM (50 minutes)

Flavour symmetries provide an appealing mechanism to stabilize the dark matter particle. I present a simple model of quark flavoured dark matter that goes beyond the framework of minimal flavour violation. I discuss the phenomenological implications for direct and indirect dark matter detection experiments, high energy collider searches as well as flavour violating precision data.

Author: BLANKE, Monika (CERN & KIT)

Presenter: BLANKE, Monika (CERN & KIT)

Session Classification: Young Investigator Talks

Contribution ID: **5** Type: **not specified**

New Physics in \Delta \Gamma_d

Friday, October 31, 2014 11:50 AM (20 minutes)

Motivated by the recent measurement of the dimuon asymmetry by the D{\O} collaboration, which could be interpreted as an enhanced decay rate difference in the neutral B_d-meson system, we investigate the possible size of new-physics contributions to \Delta\Gamma_d. In particular, we perform model-independent studies of non-standard effects associated to the dimension-six current-current operators (d^{-}p)(p^{-}′b) with p,p′=u,c as well as (d^{-}b)(\tau^{-}\tau). In both cases we find that for certain flavour or Lorentz structures of the operators sizable deviations of \Delta \Gamma_d away from the Standard Model expectation cannot be excluded in a model-independent fashion.

Author: Mr TETLALMATZI-XOLOCOTZ, Gilberto (Durham University)

Presenter: Mr TETLALMATZI-XOLOCOTZ, Gilberto (Durham University)

Session Classification: Young Investigator Talks

Contribution ID: **6** Type: **not specified**

Strong couplings from Light-cone sum rules

Thursday, October 30, 2014 11:50 AM (20 minutes)

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.

Author: Mr GELHAUSEN, Patrick (University of Siegen)

Presenter: Mr GELHAUSEN, Patrick (University of Siegen)

Session Classification: Young Investigator Talks

Contribution ID: **7** Type: **not specified**

NNLO corrections to the decay B -> D pi

Thursday, October 30, 2014 12:10 PM (20 minutes)

Hadronic decays of B mesons provide an essential contribution in testing the CKM structure of the Standard Model. It is therefore mandatory to increase the precision of their branching rations as much as possible, both experimentally and theoretically. In this talk we investigate the decay \bar B^0-> D^+\pi^- at NNLO in QCD factorization, a model-independent framework which disentangles perturbative from non-perturbative effects in the heavy-mass limit. We present the result for the two-loop correction to the hard scattering kernel, including calculational techniques such as Laporta reduction to master integrals and Mellin Barnes representations and differential equations for evaluating the latter.

Authors: Ms KRAENKL, Susanne (University of Siegen); Dr HUBER, Tobias (University of Siegen)

Presenter: Ms KRAENKL, Susanne (University of Siegen)

Session Classification: Young Investigator Talks

Contribution ID: **8** Type: **not specified**

NLO Corrections to Inclusive B Decays

Tuesday, October 28, 2014 5:30 PM (20 minutes)

Inclusive semileptonic B decays offer a possibility to test the Standard Model (SM) in its flavor structure. The relevant SM parameters are the quark mixing parameters that accompany these types of decays, gathered in the CKM matrix. In my talk I'm going to present the technique to determine the inclusive width of a heavy flavored meson which allow to extract the CKM matrix elements V_{qb}. As an approach we use the Heavy quark expansion and calculate analytically the perturbative QCD corrections to the power suppressed contribution of the chromo-magnetic operator. In the calculation the final state quark is treated as massless.

Author: Mr ROSENTHAL, Denis (Uni Siegen)

Presenter: Mr ROSENTHAL, Denis (Uni Siegen)

Session Classification: Young Investigator Talks

Contribution ID: **9** Type: **not specified**

The bottom quark mass from non-relativistic sum rules at NNNLO

Thursday, October 30, 2014 12:30 PM (20 minutes)

Decays of B mesons scale with high powers of the bottom quark mass. To avoid large parametric uncertainties precise knowledge of this parameter is important. We determine the mass of the bottom quark from moments of the $b\bar{b}$ production cross section near threshold. On the theory side we use NNNLO predictions both for the resonances and the continuum cross section. We compare our result to other recent precision determinations.

Authors: Dr MAIER, Andreas (TU Munich); Dr PICLUM, Jan (TU Munich); Prof. BENEKE, Martin (TU Munich); Mr RAUH, Thomas (TU Munich)

Presenter: Mr RAUH, Thomas (TU Munich)

Session Classification: Young Investigator Talks

Contribution ID: **10** Type: **not specified**

Search for the Rare Decay $B^0 \to \tau^+\tau^-$ at Belle

Tuesday, October 28, 2014 5:10 PM (20 minutes)

In the Standard Model the decay $B^0 \to \tau^+\tau^-$ is highly suppressed with a predicted branching ratio of $\mathcal{B}_{\mathrm{SM}}(B^0 \to \tau^+\tau^-) \approx 3 \times 10^{-8}$. The BaBar collaboration estimated an upper limit of $\mathcal{B} < 4.1 \times 10^{-3}$ at the 90\% confidence level using a data sample of 232×10^6 $B\bar{B}$ pairs.
The search presented in this talk is performed on data collected on the $\Upsilon(4S)$ resonance with the Belle detector at the KEKB asymmetric-energy e^+e^- collider. The data sample contains 772×10^6 $B\bar{B}$ pairs, which is a factor three more than used in the BaBar analysis.
For the analysis one of the B mesons is fully reconstructed in hadronic decay modes using a hierarchical NeuroBayes-based algorithm. Using a multivariate analysis method the background is reduced to reach higher sensitivity.
An expected upper limit on the branching ratio is estimated on simulated Monte Carlo events.

Author: ZIEGLER, Michael (EKP)

Presenter: ZIEGLER, Michael (EKP)

Session Classification: Young Investigator Talks

Contribution ID: **11** Type: **not specified**

A Left-Right Symmetric Model with doublets

Friday, October 31, 2014 12:10 PM (20 minutes)

Left-Right Symmetric Models (LRSM) attempt at giving an understanding of the violation of parity (or charge-conjugation) by the weak interactions in the SM through the introduction of right-handed currents. The spontaneous symmetry breaking of SU(2)*LxSU(2)_RxU(1)*(B-L) is usually triggered by an enlarged Higgs sector, usually consisting of two triplet fields (left-right symmetry breaking) and a bi-doublet (electroweak symmetry breaking). I reconsider an alternative LRSM with doublet instead of triplet fields and a Higgs bi-doublet. After explaining some features of this model, I discuss constraints on its parameters using electroweak precision and neutral-meson mixing observables, combining them using the CKMfitter frequentist statistical framework.

Author: Mr VALE SILVA, Luiz Henrique (Laboratoire de Physique Theorique)

Presenter: Mr VALE SILVA, Luiz Henrique (Laboratoire de Physique Theorique)

Session Classification: Young Investigator Talks

Contribution ID: **12** Type: **not specified**

Charm Physics at LHCb

Tuesday, October 28, 2014 2:30 PM (1h 30m)

Presenter: Dr GERSABECK, Marco (The University of Manchester)

Session Classification: Charm Physics at LHCb

Contribution ID: **13** Type: **not specified**

Flavor Physics at Belle and Belle II

Wednesday, October 29, 2014 9:30 AM (1h 30m)

Presenter: Prof. KRIZAN, Peter (University of Ljubljana and JSI)

Session Classification: Flavor Physics at Belle and Belle II

Contribution ID: **14** Type: **not specified**

Two loop new physics corrections in rare decays

Wednesday, October 29, 2014 12:20 PM (20 minutes)

Presenter: Mr WIEGAND, Christoph (KIT)

Session Classification: Young Investigator Talks

Contribution ID: **15** Type: **not specified**

A Solution to Singularities Arising at NLO in the Calculation of epsilon'/epsilon

Wednesday, October 29, 2014 12:40 PM (20 minutes)

Presenter: Mr TREMPER, Paul (KIT)

Session Classification: Young Investigator Talks

Contribution ID: **16** Type: **not specified**

Flavourful Ways to the Shortest Distance Scales Explored by Humans

Wednesday, October 29, 2014 2:30 PM (1h 30m)

Presenter: Prof. BURAS, Andrzej (TUM-IAS)

Session Classification: Quark Flavor Physics

Contribution ID: **17** Type: **not specified**

New Physics Models or On the Rare Occasions When Naturalness Meets Flavor

Thursday, October 30, 2014 9:30 AM (1h 30m)

Presenter: Prof. PEREZ, Gilad (Weizmann)

Session Classification: New Physics Models

Contribution ID: **18** Type: **not specified**

QCD Factorization

Thursday, October 30, 2014 2:30 PM (1h 30m)

Presenter: Prof. BENEKE, Martin (TU Muenchen)

Session Classification: QCD Factorization

Contribution ID: **19** Type: **not specified**

Lepton Flavor (and Number) Physics

Friday, October 31, 2014 9:30 AM (1h 30m)

Presenter: Dr RODEJOHANN, Werner (MPIK)

Session Classification: Lepton Flavor Physics

Contribution ID: **20** Type: **not specified**

Lifting degenerate neutrino masses, threshold corrections and maximal mixing

Friday, October 31, 2014 11:30 AM (20 minutes)

Presenter: Mr HOLLIK, Wolfgang G. (KIT)

Session Classification: Young Investigator Talks

Contribution ID: **21** Type: **not specified**

Conference Dinner

Wednesday, October 29, 2014 7:00 PM (2 hours)

Contribution ID: **22** Type: **not specified**

Social Event

Thursday, October 30, 2014 5:00 PM (1 hour)

Contribution ID: **23** Type: **not specified**

Evening Lecture

Contribution ID: **24** Type: **not specified**

The Flavor of Economics

Wednesday, October 29, 2014 4:30 PM (1 hour)

Presenter: Dr WICK, Felix (Blue Yonder)

Session Classification: Evening Lecture