

T 6: Elektroschwache Wechselwirkung 1

Zeit: Montag 11:00–12:15

Raum: P6

T 6.1 Mo 11:00 P6

Analysis of the Muon Pair Forward-Backward Asymmetry at the Belle Experiment — ●TORBEN FERBER for the Belle-Collaboration — DESY, Notkestr. 85, 22607 Hamburg

The Belle detector was operated at the asymmetric electron-positron collider KEKB in Tsukuba, Japan, between 1999 and 2010. Being designed as a so-called B-Factory, its center-of-mass energy was in the range of the Υ resonances, with the bulk of the data taken at $\Upsilon(4S)$ (10.58 GeV). The large available data sample of more than one billion muon pairs at Belle allows precision tests of the electroweak theory at energies below the Z-pole. The Standard Model predicts interference effects between gamma and Z-boson exchange in fermion pair production which cause a forward-backward charge asymmetry A_{FB} . This asymmetry is related to the weak mixing angle $\sin^2(\theta_W)$ and is energy dependent in the SM. Any deviations from the predicted energy dependency hint to New Physics. Within this talk, the current status of the analysis of the muon pair charge asymmetry will be presented.

T 6.2 Mo 11:15 P6

Status and prospects of the electroweak fit with Gfitter — MAX BAAK¹, ●JAKUB CUTH², JOHANNES HALLER³, ANDREAS HOECKER¹, ROMAN KOGLER³, KLAUS MOENIG⁴, MATTHIAS SCHOTT², and JOERG STELZER⁵ — ¹CERN, Switzerland — ²U. Mainz, Germany — ³U. Hamburg, Germany — ⁴DESY, Germany — ⁵Michigan State, USA

Since the discovery of the Higgs boson, all fundamental Standard Model parameters are known. In the global fit of the Standard Model using Gfitter, electroweak precision observables are compared with state-of-the-art electroweak predictions. The Gfitter framework is also used to derive prospects of the high-luminosity LHC and future electron-positron colliders, and to test new physics models through STU parameters or Higgs coupling parametrisations. Results from these studies are presented.

T 6.3 Mo 11:30 P6

A measurement of the polarization of τ leptons produced in Z decays at CMS — ●VLADIMIR CHEREPANOV, GÜNTER FLÜGGE, BASTIAN KARGOLL, ALEXANDER NEHRKORN, IAN M. NUGENT, LARS PERCHALLA, CLAUDIA PISTONE, and ACHIM STAHL — III. Physikalisches Institut B, RWTH Aachen University, D-52056 Aachen

Extensive measurements of the τ lepton polarization and its forward-backward asymmetry at the Z^0 resonance have been performed at LEP. Today, the LHC provides the opportunity for testing the Standard Model of electroweak interactions with τ leptons through a measurement of their forward-backward asymmetry and their polarization. The additional challenges at the LHC are the huge QCD background and

the unknown τ lepton energy. First results on the τ lepton polarization at CMS using the $Z^0 \rightarrow \tau_\mu \tau_{3\pi}$ final state are presented.

T 6.4 Mo 11:45 P6

Measurement of different b -hadron lifetimes, lifetime ratios and $\Delta\Gamma_d/\Gamma_d$ at LHCb — ●FRANCESCA DORDEI for the LHCb Gruppe Physikalisches Institut Heidelberg-Collaboration — Physikalisches Institut, Heidelberg, Germany

Precision measurement of b -hadron lifetimes are an important test of the theoretical approach to b -hadron observables known as Heavy Quark Expansion (HQE). In this talk, a measurement of the absolute lifetimes of the B^+ , B^0 and B_s^0 meson and Λ_b^0 baryon lifetimes is presented. To perform these measurements data corresponding to an integrated luminosity of 1.0 fb^{-1} are used, collected in 2011 with the LHCb detector.

The challenge of precision lifetime measurements is that small decay-time dependent efficiencies and lifetime biases are introduced from a variety of sources, in particular related to the event reconstruction and selection. Given the statistical precision of few fs such biases must be controlled to a very accurate level. Various data-driven methods to correct for these effects have been developed and successfully tested, demonstrating an excellent understanding of the LHCb experiment.

This analysis resulted in the world most precise measurement of the B^+ and B^0 meson lifetimes. In addition, several lifetime ratios have been measured, to test the predictions of HQE and CPT violation. Finally, from the absolute lifetime measurements, the ratio of the decay width difference to the average width in the B^0 system will be presented.

T 6.5 Mo 12:00 P6

Suche nach dem baryonischen B -Zerfall $B^- \rightarrow \Lambda_c^+ \bar{p} \ell^- \bar{\nu}_\ell$ mit dem BABAR-Detektor — ●TORSTEN LEDDIG — Universitaet Rostock

Im Gegensatz zu leichteren Teilchen können B -Mesonen aufgrund ihrer hohen Masse in eine Vielzahl von Kanälen mit verschiedensten Baryonen zerfallen. Im Rahmen des BABAR-Experiments wurden seit 1999 mehr als 450 Millionen Ereignisse mit $B\bar{B}$ -Paaren aufgezeichnet, so dass dieser Datensatz sehr gut geeignet ist, um die Eigenschaften und Entstehungsmechanismen von Baryonen in B -Zerfällen zu untersuchen. Ein wichtiger Bestandteil zum Verständnis der Entstehungsmechanismen ist die Messung einzelner Zerfallsamplituden. Hierbei eignet sich der semileptonische B -Zerfall $B^- \rightarrow \Lambda_c^+ \bar{p} \ell^- \bar{\nu}_\ell$ besonders, da er nur ueber eine Zerfallsamplitude abläuft. Der Nachteil dieses Zerfalls ist jedoch der semi-leptonische Charakter, welcher nur eine teilweise Rekonstruktion des B -Mesons gestattet. In diesem Vortrag wird die Suche nach diesem Zerfall im Rahmen des BABAR-Experimentes vorgestellt.