

T 83: Theory BSM

Time: Wednesday 17:30–18:30

Location: HSZ/0201

T 83.1 Wed 17:30 HSZ/0201

Charge-Parity Asymmetries of Charmed Meson Decays to Pseudoscalar Mesons — ●EMIL OVERDUIN and MAURICE SCHÜSSLER — Institut für Theoretische Teilchenphysik, Karlsruher Institut für Technologie, 76131 Karlsruhe, Germany

Measurements at the Large Hadron Collider beauty experiment (LHCb) have seen larger than expected direct charge-parity (CP) asymmetries in the charmed meson decays $D^0 \rightarrow K^- K^+$ and $D^0 \rightarrow \pi^- \pi^+$, violating the Standard Model U-spin symmetry predictions at around 2σ . An attempt to explain the discrepancy will be made by postulating new physics in the decay amplitudes. The measured CP asymmetries hint at a stronger coupling to d quarks than s quarks motivating an interpretation in terms of $\Delta U = 1$ new physics, where U denotes the U-spin. New sum rules based on $SU(3)_F$ for CP asymmetries of D meson decays to pseudoscalar mesons to test the $\Delta U = 1$ model are shown, one of which holds in both the $\Delta U = 0$ and $\Delta U = 1$ cases. We propose new experimental tests for the new-physics sum rules.

T 83.2 Wed 17:45 HSZ/0201

Charge-Parity-Asymmetrien von Charmed Meson-Zerfällen in pseudoskalare Mesonen und Vektormesonen — ●MAURICE SCHÜSSLER und EMIL OVERDUIN — Institut für Theoretische Teilchenphysik, Karlsruher Institut für Technologie, 76131 Karlsruhe, Germany

Neuste Messungen der Charge-Parity-Asymmetrie (CP-Asymmetrie) in $D^0 \rightarrow K^+ K^-$ und $D^0 \rightarrow \pi^+ \pi^-$ Zerfällen stimmen nicht gut mit den Vorhersagen des etablierten Standardmodells der Teilchenphysik überein. Wir untersuchen die Hypothese, dass diese Spannung von Beiträgen jenseits des Standardmodells stammt, die den U-Spin um eine Einheit ändern. Zur Überprüfung dieser Hypothese mit künftigen Daten betrachten wir Zerfälle von D^0, D^+, D_s^+ -Mesonen in Endzuständen aus einem pseudoskalaren Meson und einem Vektormeson. Im Vortrag werden Summenregeln zwischen CP-Asymmetrien vorgestellt, die die

neuen $\Delta U = 1$ -Beiträge erfüllen und somit Konsistenzchecks künftiger Messungen erlauben.

T 83.3 Wed 18:00 HSZ/0201

Corrections of the B meson baryogenesis model to lifetimes of B mesons. — ●ALI MOHAMED, ALEXANDER LENZ, MARIA LAURA PISCOPO, ALEKSEY RUSOV, and ZACHARY WÜTHRICH — Siegen university

The framework of B meson Baryogenesis by Alonso-Álvarez, Elor, and Escudero aims at describing the matter-antimatter asymmetry and the existence of dark matter in the Universe by introducing new decay channels of the b quark. These new decay channels could also modify other observables, e.g. the lifetime ratio of B^+ and B_d mesons. We perform a study of the possible size of these new contributions to $\tau(B^+)/\tau(B_d)$ within the framework of the Heavy Quark Expansion.

T 83.4 Wed 18:15 HSZ/0201

Holographic Non-Abelian Flavour Symmetry Breaking — ●YANG LIU¹, WERNER POROD¹, JOHANNA ERDMENGER¹, and NICHOLAS EVANS² — ¹Universität Würzburg — ²University of Southampton

Multiple AdS/QCD models have been constructed to explain the lowest QCD meson and baryon spectra. Albeit the action is formulated in a non-abelian way, the spectra are essentially abelian. To produce the non-abelian spectra as observed in QCD, our work starts with the non-abelian DBI action taken from a top-down model in string theory. In constructing a bottom-up version, we keep the spirit of the top-down model, i.e. extending the action to matrices in flavour space, which describes coincident N_f D-branes. The explicitly breaking of the flavour symmetry is realised by separating the branes. The fact that the metric and coupling constants are matrices in the flavour space marks the main difference from the other models. We computed the two- and three-flavour QCD spectra and show the validity of our model.