

T 16: Flavourphysik (Theorie) II

Convenor: Martin Gorbahn / Sebastian Jäger

Zeit: Donnerstag 16:45–18:00

Raum: HG XIII

T 16.1 Do 16:45 HG XIII

Flavor and the Spurion Algebra — GUDRUN HILLER and •STEFAN SCHACHT — Institut für Physik, Technische Universität Dortmund, D-44221 Dortmund

Based on the properties of the Quark Yukawa matrices the algebraic characteristics of Flavor are studied. In this context we consider Minimal vs. non-Minimal Flavor Violation and look at Supersymmetry as a special example.

T 16.2 Do 17:00 HG XIII

Quark and Lepton Yukawa coupling ratios in GUTs — STEFAN ANTUSCH¹, STEPHEN F. KING², MICHAL MALINSKY³, and •MARTIN SPINRATH¹ — ¹Max-Planck-Institut für Physik (Werner-Heisenberg-Institut) Föhringer Ring 6, D-80805 München, Germany — ²School of Physics and Astronomy, University of Southampton, SO17 1BJ Southampton, United Kingdom — ³Department of Theoretical Physics, School of Engineering Sciences, Royal Institute of Technology (KTH) – AlbaNova University Center, Roslagstullsbacken 21, 106 91 Stockholm, Sweden

The down-type quark and charged lepton Yukawa couplings in supersymmetric models depend strongly on the SUSY spectrum for large $\tan\beta$ due to 1-loop threshold effects. Therefore also the GUT scale Yukawa coupling ratios depend on the SUSY parameters. The observed fermion masses together with common SUSY breaking scenarios and phenomenological constraints give possible ranges for these ratios which can be compared with predictions from SUSY GUTs. We discuss the viable predictions and their possible realisations in GUT model building.

T 16.3 Do 17:15 HG XIII

Flavour Physics in the Presence of a Fourth Generation of Quarks and Leptons - Part I — •CHRISTOPH PROMBERGER for the TUM-T31 4G-Collaboration — Physik Department, Technische Universität München, James-Franck-Straße, D-85748 Garching, Germany

We present a comprehensive analysis of $\Delta F = 1$ and $\Delta F = 2$ processes

in the presence of a fourth generation of quarks and leptons, taking into account recent bounds from the global electroweak fit.

In the first part, I will discuss the structure of the SM4 and present our global analysis taking into account the bounds of $\Delta F = 2$ processes and selected $\Delta F = 1$ observables.

T 16.4 Do 17:30 HG XIII

Flavour Physics in the Presence of a Fourth Generation of Quarks and Leptons - Part II — •TILLMANN HEIDSIECK for the TUM-T31 4G-Collaboration — Physik Department, Technische Universität München, James-Franck-Straße, D-85748 Garching, Germany

We present a comprehensive analysis of $\Delta F = 1$ and $\Delta F = 2$ processes in the presence of a fourth generation of quarks and leptons taking into account recent bounds from the global electroweak fit.

T 16.5 Do 17:45 HG XIII

Non-leptonic B decays in a supersymmetric GUT model — •LEONARDO VERNAZZA — Institut für Physik (WA THEP), Johannes-Gutenberg-Universität, 55099 Mainz, Germany

Motivated by the search for new physics in non-leptonic B decays, we analyse effects arising in a supersymmetric GUT model elaborated by Chang, Masiero and Murayama. The non-MFV structure of GUT models is interesting, because the large neutrino mixing angles are communicated to the quark sector by the GUT relations, giving rise to a large mixing between the right-handed quarks. Supersymmetry allows this mixing to become physical, thanks to the flavour-changing couplings arising between quarks, squarks and gluinos. The construction of a whole chain of GUTs up to the Planck scale allows to describe the low energy processes in terms of a few fundamental parameters, so that the model is predictive and gives specific signatures and correlations. We analyse non-leptonic decays in view of the constraints arising from the lightest Higgs boson mass and from flavour-changing processes like $\tau \rightarrow \mu\gamma$, $b \rightarrow s\gamma$ and ΔM_s . Once these constraints are taken into account large modifications to the branching ratios are ruled out, but we find that the presence of a new weak phase makes a few observables, like the time-dependent CP asymmetry, rather sensitive to this scenario.