

T 49: Eingeladene Vorträge III

Zeit: Mittwoch 14:00–15:30

Raum: H02

Eingeladener Vortrag T 49.1 Mi 14:00 H02
Higgs Boson Properties as a Window to New Physics —
 ●KATHRIN BECKER — Albert-Ludwigs-Universität Freiburg

So far, direct searches at the LHC have not observed any hints for physics beyond the Standard Model. New physics outside the reach of direct searches can affect the properties of Standard Model particles at LHC energies. These deviations can be described using general approaches like effective field theories.

One of the most promising particles to look for these deviations is the Higgs boson. Additional couplings can affect kinematic distributions, like the transverse momentum of the Higgs boson or the angular difference of the two leading jets, or properties like its CP symmetry. In my presentation I will discuss different measurement approaches like differential and simplified template cross sections. Their aim is to maximise our knowledge about the Higgs boson with the currently available dataset and make interpretations in effective field theories and specific extensions of the Standard Model possible. Recent results from the ATLAS experiment are presented and discussed.

Eingeladener Vortrag T 49.2 Mi 14:30 H02
Precise QCD predictions for the LHC — ●ALEXANDER HUSS —
 Theoretical Physics Department, CERN, 1211 Geneva 23, Switzerland

The LHC offers the widest range of physics opportunities: Among the highest priorities is the understanding of the Higgs boson and the search for physics beyond the SM. In view of the absence of striking new-physics signals to date, BSM physics is likely hiding in small and subtle effects. Revealing such phenomena though precision studies critically relies on our ability to predict both signal and background processes with high precision.

I will review some state-of-the art QCD predictions for hadron col-

liders and their impact on the interpretation of LHC measurements. A focus will be put on perturbative calculations for Higgs- and gauge-boson processes and the underlying subtraction procedures. Current limitations will be addressed with an outlook on future developments relevant for precision phenomenology.

Eingeladener Vortrag T 49.3 Mi 15:00 H02
Vector Boson Scattering: a new toolkit to probe the standard model and beyond — ●JOANY MANJARRES — Technische Universität Dresden

The discovery of the Higgs boson at the Large Hadron Collider (LHC) has invigorated the study of electroweak symmetry breaking (EWSB) and confirmed once again that the Standard Model (SM) is a reliable model, at least as a first approximation. However fundamental questions remain unanswered by the SM. Some hints for our New Physics quest may be found at the heart of the SM, in the breaking of the electroweak symmetry. With the EWSB mechanism vector bosons acquire mass through their coupling to the Higgs field. At the same time, EWSB rules the scattering of vector bosons (VBS, vector boson scattering), avoiding its divergence at high energy. The rate of occurrence of VBS processes is predicted by the SM to be very low due to cancellations of different contributions. Processes related to new physics can disturb this delicate balance and lead to potentially large enhancements of the VBS rate, making it the ideal process for a model-independent test-bench of new physics at an energy scale never investigated before. The door for measuring VBS has just open. We will scrutinize the first experimental results obtained by ATLAS with a partial dataset. We will also explore the potential VBS analysis have with the upcoming LHC data to ultimately test the SM at high precision or possibly hinting at new physics.