

T 25: Eingeladene Vorträge I

Zeit: Dienstag 14:00–15:30

Raum: H02

Eingeladener Vortrag T 25.1 Di 14:00 H02
The Higgs Boson at CMS: from Top to Bottom — ●MATTHIAS
 SCHRÖDER — KIT

In the Standard Model of particle physics, the Higgs boson is deeply related to the mechanism that creates the masses of the elementary particles. Thus, a precise measurement of the Higgs boson properties offers a unique probe of this mechanism and plays a crucial role in testing the predictions of the Standard Model or revealing potential new physics.

The Higgs boson mass and its couplings to the electroweak gauge bosons have been established early after its discovery during LHC Run 1, but high sensitivity to the couplings to fermions is achieved only now with the large amount of data collected at 13 TeV centre-of-mass energy during LHC Run 2. This led to the recent observations of the Higgs boson couplings to tau leptons and top and bottom quarks, which mark crucial steps in understanding the mechanism of fermion-mass generation.

In this presentation, the latest Higgs boson measurements performed with the CMS experiment will be reviewed, with special focus on the couplings to fermions. Furthermore, prospects for future measurements at the High-Luminosity LHC will be discussed.

Eingeladener Vortrag T 25.2 Di 14:30 H02
Searches for long-lived particles as signs of new physics at the

LHC — ●SASCHA MEHLHASE — LMU Munich

Particles beyond the Standard Model (SM) can generally have lifetimes that are long compared to SM particles at the weak scale. When produced at the Large Hadron Collider (LHC), such long-lived particles (LLPs) can decay far from the primary interaction vertex and possibly themselves interact with the detector material, leading to a wide variety of detector signatures. Such LLP signatures are distinctly different from those associated with searches for promptly decaying BSM particles that constitute the bulk of searches for new physics at the LHC, often requiring dedicated analysis and reconstruction techniques. This contribution aims to motivate searches for new long-lived particles, highlight possible signatures and challenges, and summarise the current status of searches for LLPs at the LHC.

Eingeladener Vortrag T 25.3 Di 15:00 H02
New physics inside jets — ●CLEMENS LANGE — CERN, Genf,
 Schweiz

Jet substructure and grooming enables access to extreme regions of phase space to probe the standard model of particle physics and in the search for new physics. This presentation discusses the use and calibration of these techniques in the context of highly energetic boson decays originating from heavy resonances that are proposed by several beyond the standard model theories. Further, highlights of these resonance searches performed by the CMS collaboration are presented.