T 82: Eingeladene Vorträge 4

Zeit: Donnerstag 13:45–16:15 Raum: K.11.24 (HS 33)

Eingeladener Vortrag T 82.1 Do 13:45 K.11.24 (HS 33)
Measurements of Top Quark Pair Production with the CMS Experiment — •Carmen Diez Pardos — DESY, Hamburg, Germany

The top quark is the heaviest known elementary particle and the only quark that decays before hadronisation, and thus gives direct access to its properties. With its large mass, it plays a crucial role for testing the quality of the Standard Model (SM) and plays a key role in the measurement of the Higgs boson properties. Top quark measurements also provide important input to QCD calculations. Moreover, various scenarios of physics beyond the SM expect the top quark to couple to new particles.

The large data samples collected at the CERN LHC at a centre-of-mass energy of 7 and 8 TeV have allowed performing very precise measurements of top quark production and properties, challenging the accuracy of the state-of-the-art SM theoretical predictions. In this presentation, I will review the current status of top-quark-pair ($t\bar{t}$) production measurements performed with the CMS experiment, focusing on inclusive and differential $t\bar{t}$ production cross sections, as well as $t\bar{t}$ production in association with jets or additional bosons.

Eingeladener Vortrag T 82.2 Do 14:15 K.11.24 (HS 33)
Search for Physics beyond the Standard Model with the ATLAS detector in final states with high-p_T leptons — •Giovanni Siragusa for the ATLAS-Collaboration — Julius-Maximilians-Universität, Würzburg, Germany

The center-of-mass energies available at the LHC provide an excellent opportunity to test the Standard Model and search for New Physics. Exotic searches play a key role by testing a large variety of predictions and exploring a large number of different final states, which cover a huge part of the available phase space. Until now no relevant discrepancy has been observed and the various searches have been interpreted in terms of exclusion limits.

Signals containing high-p_T leptons in the final state are predicted in many extensions of the Standard Model, while such signatures are more rare in background processes. As a consequence, when high-p_T leptons are selected, the signal to background ratios are enhanced and the experimental sensitivity is increased. In this talk I will present a review of Exotics searches performed by the ATLAS experiment using 20 fb^{-1} of data collected at $\sqrt{s} = 8$ TeV in a variety of final states containing high-p_T leptons.

Eingeladener Vortrag T 82.3 Do 14:45 K.11.24 (HS 33)
Top-Quarks: Heavyweights in New Physics Searches — •Susanne Westhoff — Department of Physics and Astronomy (PITT PACC), University of Pittsburgh, Pittsburgh PA 15260, USA

In the search for new physics at colliders, top-quark observables are a well-motivated choice. Top-quarks are by far the heaviest known particles, with a strong coupling to the Higgs boson. They have a critical impact on the stability of our universe and of the electroweak scale. These aspects predestine top-quarks as possible guides to physics beyond the standard model. I portray up-to-date new-physics searches in top-quark observables at the LHC and venture an outlook to top-quarks at a future 100-TeV hadron collider.

Eingeladener Vortrag T 82.4 Do 15:15 K.11.24 (HS 33)
The LHCb Upgrade Scintillating Fibre Tracker — •Blake Leverington for the LHCb-Collaboration — Ruprecht-Karls-Universitaet, Heidelberg, Germany

The Scintillating Fibre (SciFi) Tracker is designed to replace the current downstream tracking detectors in the LHCb Upgrade during 2018 [1]. The planned increase in interactions per bunch crossing and 40 MHz trigger rate in order to collect up to 50 fb^{-1} of data over 10 years will result in an increased occupancy in the tracking detectors and will exceed the operational occupancy for the Outer Tracker. Here we present the SciFi Tracker as the replacement for the Outer and Inner Trackers.

The SciFi Tracker is based on 2.5 m long multi-layered ribbons from 10,000 km of 0.250 mm diameter scintillating fibre as the active medium and signal transport over 12 planes covering 350 m^2. Cooled silicon photomultiplier (SiPM) arrays with 128 channels and 0.25 mm channel width are used as readout. The front-end electronics are designed to digitize the signals from the SiPMS with a custom ASIC chip, the PACIFIC, for the approximately 560,000 channels and reconstruct the track hit position within an on-board FPGA. Several challenges facing this detector will be presented regarding the precision construction of the large active detector components, the radiation hardness of the scintillating fibres and the SiPMs, the high density readout electronics, and the necessary cooling systems.

Eingeladener Vortrag T 82.5 Do 15:45 K.11.24 (HS 33)
The upgraded ATLAS Pixel Detector for the LHC Run-2 — •Tayfun Ince for the ATLAS-Collaboration — Max-Planck-Institute for Physics, Munich, Germany

The ATLAS Pixel Detector has shown excellent performance during the LHC Run-1. Taking advantage of the long shutdown, the detector was extracted from the experiment and brought to surface in 2013, to equip it with new service quarter panels, to repair the non-operational modules and to ease installation of the Insertable B-Layer (IBL). The IBL is the new inner-most pixel layer installed in May 2014 at a radius of 3.3 cm between the existing Pixel Detector and a new smaller radius beam-pipe. To cope with the high radiation and pixel occupancy due to the proximity to the interaction point, a new read-out chip and two different silicon sensor technologies, planar and 3D, are developed. The physics performance will be improved through the reduction of pixel size. While targeting for a low material budget, a new mechanical support using light weight staves and CO2 based cooling system are adopted. An overview of the Pixel Detector refurbishment and the IBL project as well as the experience in its construction will be presented, focusing on adopted technologies, module and stave production, quality assurance procedure, integration of staves around the new beam pipe and commissioning of the detector.