

T 45: Eingeladene Vorträge II

Zeit: Dienstag 13:45–16:15

Raum: VMP8 HS

Eingeladener Vortrag T 45.1 Di 13:45 VMP8 HS
Hadronic vector-boson pair production at NNLO QCD —
 •STEFAN KALLWEIT — Johannes Gutenberg University of Mainz,
 Mainz, Germany

I report on the computation of vector-boson pair production at next-to-next-to-leading order in QCD perturbation theory by means of the transverse-momentum (q_T) subtraction method. This method, which is applicable to achieve NNLO QCD accuracy in the production of any colourless final-state, is introduced, and the technical realization of the calculation within the MATRIX framework is briefly discussed. The main part of this presentation is dedicated to numerical results and comparisons to experimental data on inclusive and fiducial cross sections as well as on selected distributions for the production of $Z\gamma/W\gamma$ and ZZ/WW pairs, including the leptonic decays of the heavy vector bosons.

Eingeladener Vortrag T 45.2 Di 14:15 VMP8 HS
Auslesekonzepte für zukünftige Teilchendetektoren —
 •TOBIAS FLICK — Bergische Universität Wuppertal

Zukünftige Detektoren werden durch höhere Luminositäten und feinere Granularitäten, sowie Nähe zum Wechselwirkungspunkt, ein Vielfaches des Datenvolumens erzeugen, das derzeit üblich ist. Ebenso entwickelt sich aber auch die Technik, die in der Auslese eingesetzt werden kann. Die Auslese, Verteilung und Speicherung der Daten muss den erzeugten Raten folgen, um effizient Daten zur Analyse zur Verfügung stellen zu können. Sowohl die Trigger-Raten als auch die Übertragungsraten steigen enorm im Vergleich zu den aktuellen Experimenten. Dazu sind high-speed Datenstrecken im Multi-Gigabit/s Bereich nötig, sowie natürlich strahlenharte Elektronik und Optik innerhalb der Detektoren, die diese Raten bewerkstelligen können, wie es derzeit an den LHC-Experimenten geplant wird.

Der Vortrag wird Strategien zur Auslese von zukünftigen Detektoren in der Teilchenphysik beleuchten. Dazu gehören sowohl die klassischen Auslesekonzepte als auch innovative Verfahren, wie "wireless readout", und der Einsatz alternativer Materialien im Datenauslesepfad.

Eingeladener Vortrag T 45.3 Di 14:45 VMP8 HS
Hunting dark matter in the sky and at colliders — •KAI
 SCHMIDT-HOBERG — DESY

I will discuss searches for dark matter in astrophysical as well as collider based experiments with a particular focus on the complementarity

between different searches.

Eingeladener Vortrag T 45.4 Di 15:15 VMP8 HS
Preparing the start of neutrino mass measurements with KATRIN — •KATHRIN VALERIUS for the KATRIN-Collaboration — Institute for Nuclear Physics, Karlsruhe Institute of Technology (KIT)

The Karlsruhe Tritium Neutrino Experiment (KATRIN) is targeted at improving the sensitivity on the electron neutrino mass $m(\nu_e)$ down to $200 \text{ meV}/c^2$ at 90% CL. The model-independent method relies on precision β -decay spectroscopy of molecular tritium near the spectral endpoint using an ultra-luminous gaseous tritium source and a high-resolution electrostatic spectrometer. With the arrival of the last major system components at KIT in the summer of 2015 the final phase in the integration of all subsystems has started.

This talk presents an overview of the current activities in commissioning the full KATRIN beam line, in determining the systematic uncertainties, and in preparing the data analysis. The initial physics programme at the start of tritium measurements will be discussed. Furthermore, the presentation outlines opportunities to search for new physics phenomena in the precision β -decay data of KATRIN.

Eingeladener Vortrag T 45.5 Di 15:45 VMP8 HS
Magnetic fields and cosmic rays in galaxy clusters — •ANNALISA
 BONAFEDE — Hamburger Sternwarte, Hamburg

The extreme physical conditions in the intra-cluster medium of galaxy clusters are beyond anything achievable in any laboratory on Earth, and offer us a unique tool to study magnetic fields and cosmic rays on the largest scales in the Universe. A big challenge of modern astrophysics is understanding the origin of radio emission spread over the volume of some galaxy cluster. This emission is a mystery because it requires relativistic electrons moving around magnetic field lines, but both the origin of the magnetic fields and of the electrons are unknown. We are entering into a golden age to address these fundamental problems, thanks to the advent of a new generation of radio telescopes, such as LOFAR, the JVLA, and ASKAP. At the same time, the new eROSITA X-ray satellite is going to provide us with a wealth of new data on the most distant and less massive galaxy clusters and groups. In this talk, I will review our current knowledge about magnetic fields and cosmic ray particle in galaxy clusters, and I will illustrate the potential of the new generation of radio instruments to answer the many open questions about the origin and evolution of magnetic fields and cosmic rays.