HK 44: Hauptvorträge II

Zeit: Donnerstag 11:00–12:30 Raum: Audimax

Hauptvortrag HK 44.1 Do 11:00 Audimax

Probing the quark-gluon plasma in ultrarelativistic heavy-ion collisions — •Alice Ohlson — Physikalisches Institut, Universität Heidelberg

In high-energy collisions of heavy nuclei, such as in collisions of lead ions at the Large Hadron Collider, the resulting state of matter attains such high temperatures and energy densities that quarks and gluons are no longer confined into hadrons. Known as the quark-gluon plasma (QGP), this matter occupies the high-temperature and high-density regime of the phase diagram of quantum chromodynamics (QCD). By probing the properties of the QGP, we are able to study QCD and the strong nuclear force in the extreme high temperature limit.

In this talk, a selection of key measurements will be presented which give insight into the space-time evolution of the QGP and its thermodynamical and hadrochemical properties, with particular emphasis placed on single- and multi-particle measurements of (un)identified light hadrons.

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Hauptvortrag HK 44.2 Do 11:30 Audimax

Transverse momentum dependent (TMD) factorization: status and progress — •Alexey Vladimirov — Regensburg University

The information on "3-dimensional imaging" of hadrons, encoded in unintegrated, transverse momentum dependent (TMD) parton densities and parton decay functions. At present it comes from two main sets of experimental data: low-qT Drell-Yan and semi-inclusive deep inelastic scattering (polarized and unpolarized). In each of these two cases, QCD factorization theorems allow one to relate observable cross sections to TMD parton distributions via perturbatively calculable kernels. We provide an overview of transverse momentum dependent (TMD) parton distribution functions and their application in high-energy physics phenomenology. The particular emphasis is made on the theoretical aspects TMD factorization, and on the recent development in this area.

Hauptvortrag HK 44.3 Do 12:00 Audimax

Measuring the free neutron lifetime with ultracold neutrons at TRIGA Mainz — •Dieter Ries for the tauSPECT-Collaboration — Institute of Nuclear Chemistry, Johannes Gutenberg University, Mainz, Germany

Ultracold Neutrons (UCN), neutrons with kinetic energies below 335 neV, provide a unique tool for fundamental neutron research with long observation times.

The τSPECT experiment, which is currently being commissioned at the pulsed UCN source of the TRIGA Mainz, aims to utilize this fact in order to precisely measure the free neutron lifetime.

In order to reduce systematic errors with respect to previous storage experiments using material bottles, τSPECT will implement 3D magnetic storage of UCN and will be able to measure both the decaying and the surviving UCN.

An introduction to UCN and their properties will be given as well as a description of the τSPECT experiment and the planned neutron lifetime measurements at the TRIGA Mainz.