FAKULTÄT für PHYSIK
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MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 21.11.2013, 16^{15} Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Boris Grube

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Hadron Spectroscopy at the COMPASS Experiment

Quantum Chromodynamics (QCD), the theory of strong interactions, permits the calculation of short-distance phenomena via perturbative methods exploiting the asymptotic freedom of QCD. However, the understanding of large-distance phenomena involving confinement, where perturbation series in the coupling constant is not applicable, still poses considerable theoretical and experimental challenges and is one of the key issues in particle physics.
A way of getting more insight, is the precise determination of the spectra of mesons and baryons composed of u, d, and s quarks. In the naive Constituent Quark Model (CQM) mesons are described as quark-antiquark states, but more advanced QCD-inspired models and also recent Lattice QCD calculations predict the existence of hadrons with exotic properties interpreted as excited gluonic field configurations (hybrids) or even pure gluonic bound states (glueballs).
The COMPASS experiment, a multi-purpose fixed-target spectrometer at the CERN Super Proton Synchrotron, has acquired large data sets using 190 GeV positive and negative hadron beams on various targets, which allow to study light-quark meson and baryon spectra with high precision. COMPASS is able to measure final states with charged as well as neutral particles, so that resonances can be studied in different reactions and decay channels. The presented overview of the first results from this data set focuses in particular on the search for hybrids and glueballs in diffractive and central-production reactions.

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