**Physics Seminar**

**Boris Grube**

**Technische Universität München**

**The study of the excitation spectrum of hadrons has provided essential
clues that helped to develop Quantum Chromodynamics (QCD) as the theory
of strong interaction.
However, some deep puzzles remain. In the constituent quark model,
hadrons are either combinations of three quarks, which are called
baryons, or quark-antiquark states, which are called mesons. However,
QCD in principle allows for more complicated hadronic states like
multi-quark states (e.g. molecule-like objects), states with excited
gluonic fields (hybrids), or even purely gluonic bound states (glueballs).

The hunt for these so-called exotic hadrons is a world-wide experimental
effort. The COMPASS experiment at CERN has collected world-leading
datasets that allow us to study the spectrum of mesons that are composed
of the three lightest quarks (up, down, and strange) with unprecedented
detail and precision. In diffractive reactions, a rich spectrum of
isovector mesons is produced using a 190 GeV negative pion beam. The
resonances decay typically into multi-body final states and are
extracted from the data using partial-wave analysis techniques. The
two-stage spectrometer has a good acceptance for charged as well as
neutral particles over a wide kinematic range and is thus able to
measure a wide range of final states.

We have performed the so far most comprehensive partial-wave analysis of
the \pi^- \pi^- \pi^+ final state, for which COMPASS has acquired a
large data set of 46 million event. We will present selected results
from the analysis of these data with a focus on the search for exotic
mesons.**

**-Meson Spectroscopy at the COMPASS Experiment**

**June 16, 2021**

**10:00 am**

[**https://bluejeans.com/500422931/7224**](https://bluejeans.com/500422931/7224)