

## HK 41: Schwerionenkollisionen und QCD Phasen

Zeit: Donnerstag 14:00–16:00

Raum: HZ 6

**Gruppenbericht**

HK 41.1 Do 14:00 HZ 6

**p-Pb collisions at the LHC: an overview of ALICE measurements** — ●ANTON ANDRONIC for the ALICE-Collaboration — Research Division and ExtreMe Matter Institute, GSI Helmholtzzentrum für Schwerionenforschung, Planckstr. 1, 64291 Darmstadt

A crucial control experiment for the interpretation of deconfined matter studies in high-energy nucleus-nucleus collisions, proton-lead collisions at the LHC led to interesting observations of their own. Currently a hot debate is ongoing whether the measurements are described by initial-state effects related to gluon saturation or if data suggest final state, flow-like, effects akin to those studied in Pb-Pb collisions.

A summary is given of measurements in p-Pb of: i) the nuclear modification factor for inclusive charged particle production, ii) the average transverse momentum correlation with charged-particle multiplicity and iii) two-particle correlations in azimuth and pseudorapidity. The implication of these data for the understanding of the role of initial and final state effects in proton-lead collisions is discussed.

HK 41.2 Do 14:30 HZ 6

**Transverse momentum distributions of charged particles in p-Pb collisions with ALICE at the LHC** — ●JULIUS GRONEFELD for the ALICE-Collaboration — Research Division and ExtreMe Matter Institute, GSI Helmholtzzentrum für Schwerionenforschung, Planckstr. 1, 64291 Darmstadt — Institut für Kernphysik, Technische Universität Darmstadt, Schlossgrabenstr. 9, 64289 Darmstadt

ALICE is dedicated to heavy ion collisions, with the aim of understanding the physics of the hot and dense medium produced in collisions of lead ions.

The LHC is not only capable of symmetric lead lead or proton proton collisions, but can also deliver collisions between protons and lead ions. Those events are investigated in order to disentangle cold nuclear matter effects from the influence of the hot and dense medium produced in Pb-Pb collisions.

A common way to investigate the mediums or cold nuclear matter effects is the determination of the nuclear modification factor given by the ratio between a given transverse momentum ( $p_T$ ) spectrum and a pp reference spectrum scaled by the number of binary collisions.

In the talk transverse momentum distributions measured with ALICE at a collision energy of  $\sqrt{s_{NN}} = 5.02$  TeV in proton lead collisions will be presented. Spectra and  $R_{pPb}$  will be shown in dependence on multiplicity and rapidity range. In addition the findings will be compared to current models.

HK 41.3 Do 14:45 HZ 6

**Hints for collective effects in identified particle spectra from p-Pb collisions at 5.02 TeV** — ●MICHAEL SCHORK — Physikalisches Institut, University of Heidelberg, Im Neuenheimer Feld 226

First hints for collective dynamics in high-multiplicity p-Pb collisions at LHC were observed in two-particle correlations of unidentified particles [1,2]. We present results of a systematic fit using a simple blast wave parameterization [3] to identified particle spectra from p-Pb and Pb-Pb collisions as measured by ALICE at LHC. While in Pb-Pb collisions, a large number of particles can be commonly described by a single set of parameters including mass  $A=2$  and  $A=3$  nuclei, also spectra from high-multiplicity p-Pb collisions allow for a description within this rather simple model. Finally, we give predictions for spectra and the nuclear modification factor of mesons carrying a charm or bottom quark.

[1] S. Chatrchyan, CMS Collaboration et al., Phys. Lett. B, 718 (2013), 795.

[2] B. Abelev, ALICE Collaboration et al., Phys. Lett. B, 719 (2013), 29.

[3] E. Schnedermann, J. Sollfrank and U. Heinz, Phys. Rev. C48 (1993) 2462.

HK 41.4 Do 15:00 HZ 6

**Neutral meson measurement via photon conversions in p-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV with ALICE at the LHC** — ●ANNIKA PASSFELD for the ALICE-Collaboration — Institut für Kern-

physik, Westfälische Wilhelms-Universität Münster, Germany

The measurement of particle production in p-Pb collisions at high LHC energies allows the study of fundamental properties of quantum chromodynamics (QCD) at low parton momentum fraction  $x$  and high gluon densities. Moreover it is important as reference for heavy ion collisions. It can show whether the initial state of the colliding nuclei plays a role in the observed suppression of hadron production at high  $p_T$  in Pb-Pb collisions. The measurement of neutral pions has the advantage of large statistics of identified particles over a relatively large transverse momentum range. In addition, the neutral pion measurement is crucial for the background determination for other analyses like the direct photon measurement.

In this talk the current status of the  $\pi^0 \rightarrow \gamma\gamma$  and  $\eta \rightarrow \gamma\gamma$  analysis using photon conversions will be presented. Differential invariant cross sections for minimum bias collisions and for different charged particle multiplicities will be shown for both mesons as well as  $R_{p-Pb}$  for the neutral pions.

HK 41.5 Do 15:15 HZ 6

**Dielectron cocktail in pp, p-Pb and Pb-Pb collisions at the LHC** — ●IREM ERDEMIR for the ALICE-Collaboration — Institut für Kernphysik, Goethe Universität Frankfurt

The measurement of dielectrons allows to investigate the properties of strongly interacting matter, in particular the quark-gluon plasma (QGP), which is created in heavy-ion collisions at the LHC. The evolution of the collision can be probed via dielectrons since electrons do not interact strongly and are created during all stages of the collision. One of the interests in dielectron measurements is motivated by possible modifications of the electromagnetic emission spectrum in the QGP, where pp collisions are used as a medium-free reference.

The dielectron spectrum consists of contributions from various processes. In order to estimate contributions of known hadronic sources to the dielectron spectrum, calculated simulations of the so-called hadronic cocktail are performed. We present the status of the dielectron cocktail simulation in the low-mass region for pp, p-Pb and Pb-Pb collisions at LHC energies.

Supported by BMBF and the Helmholtz Association.

HK 41.6 Do 15:30 HZ 6

**Measurement of low-mass dielectrons in p-Pb collisions with ALICE** — ●THEO BRÖKER for the ALICE-Collaboration — Institut für Kernphysik, Goethe-Universität Frankfurt

Low-mass dielectrons are an important probe for the hot and dense medium which is created in ultrarelativistic heavy-ion collisions. Since leptons do not interact strongly, they carry information from all collision stages with negligible final state interaction. While pp collisions provide a reference measurement for a medium-free environment, the impact of cold nuclear matter effects on the dielectron characteristics can be estimated from p-Pb collisions. We will present the latest results of the dielectron measurements in p-Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV with the ALICE detector. The measured dielectron mass spectra will be compared to expectations from hadronic sources.

Supported by BMBF and the Helmholtz Association.

HK 41.7 Do 15:45 HZ 6

**J/ $\psi$  Production in Proton-Lead Collisions with the Central Barrel of ALICE at the LHC** — ●MICHAEL WINN for the ALICE-Collaboration — Physikalisches Institut, Universität Heidelberg

The description of J/ $\psi$  production in proton-proton and its nuclear modification in proton-nucleus collisions remains challenging for theory based on perturbative QCD and factorization. Furthermore, the investigation of J/ $\psi$  in pp and p-A collisions represents an important reference for heavy-ion collisions, where charmonium production is seen as a key observable for deconfinement.

First results of the nuclear modification factor of inclusive J/ $\psi$  in proton-lead collisions with the central barrel of ALICE, both integral as well as differential in transverse momentum, will be presented. Model comparisons will be discussed.