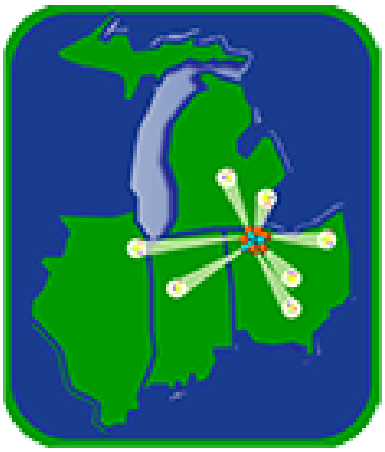
Midwest Critical Mass 2014



Report of Contributions

https://indico.bnl.gov/e/mcm2014

Contribution ID: **1** Type: **not specified**

Nontrivial holonomy and collisional energy loss

Saturday 8 March 2014 14:10 (25 minutes)

We compute the collisional energy loss for a heavy quark above the critical temperature in Quantum ChromoDynamics (QCD). We work in the semi Quark-Gluon Plasma, which assumes that this region is dominated by the non-trivial holonomy of the thermal Wilson line. Relative to the result to leading order in perturbation theory, at a fixed value of the coupling constant we generically we find that collisional energy loss is suppressed by powers of the Polyakov loop, $l < 1$. For small values of the loop, this suppression is linear for the scattering off of light quarks, and quadratic for the scattering off of gluons, or for Compton scattering.

Author: SKOKOV, Vladimir (BNL)

Presenter: SKOKOV, Vladimir (BNL)

Contribution ID: **2** Type: **not specified**

Jet Production and Structure in pp, p-Pb and Pb-Pb collisions

Friday 7 March 2014 17:10 (25 minutes)

In relativistic heavy-ion collisions a hot, dense medium of strongly interacting quarks and gluons, called the Quark Gluon Plasma (QGP), is formed. Partons that undergo a hard scatter fragment into collimated streams of particles, called jets, are a good probe because they are produced prior to QGP formation and well understood in pp collisions. In a colored medium, the fragmentation of these partons will be modified, and that will be reflected in the shape of the fragmentation pattern and in a reduction in the cross-section. The measurement of the jet production cross-section and jet shapes in different colliding systems: pp, p-Pb, and Pb-Pb, allows for the determination of jets in QCD vacuum, in cold nuclear matter and in a QGP. The first two systems produce reference measurements, which will allow a determination of the parton shower modification due to the hot partonic matter. Cold nuclear matter (CNM) effects could modify the cross-section or fragmentation relative to pp, which would need to be understood in order to interpret the measurement of the modification in hot nuclear matter. In order to fully understand the modification of the parton fragmentation function, it is important that the underlying event background and its fluctuations is well understood for all colliding systems. A measurement of hadron-jet spectra allows us to subtract the large combinatorial background in heavy-ion collisions in a model-independent way, which can allow for a wider range of jet resolution parameters to be used. We will present recent ALICE results on jet production, jet kT and hadron+jet correlations in pp, p-Pb and Pb-Pb collisions and discuss their sensitivity to a modified jet fragmentation function. I will compare these measurements to similar measurements at other collisional energies and between LHC experiments, as the medium modification should depend on the system size as well as the path-length.

Author: Dr REED, Rosi (Wayne State University)

Presenter: Dr REED, Rosi (Wayne State University)

Contribution ID: **3** Type: **not specified**

Exact solution of the Boltzmann equation in the relaxation time approximation

Saturday 8 March 2014 10:40 (25 minutes)

Experimental and theoretical studies of relativistic heavy-ion collisions showed that the behavior of matter produced in such collisions is very well described within hydrodynamic models.
These results brought a lot of attention to the studies of kinetic coefficients whose values determine the magnitude of important observables such as the elliptic flow. Interestingly, different theoretical methods lead to different values of the kinetic coefficients.
Our idea is to perform comparisons of exact solutions of simple kinetic equations with various hydrodynamic approaches, which allows us to select correct forms of these coefficients. For this purpose we exactly solve the relaxation-time approximation Boltzmann equation for a system undergoing boost-invariant longitudinal expansion. We compare the resulting exact numerical solutions with approximate solutions available which allows us to find correct expressions for shear and bulk viscosity coefficients.

Presented work is mainly based on:

W.Florkowski, R.Ryblewski, M.Strickland, Nucl.Phys. A916 (2013) 249-259

W.Florkowski, R.Ryblewski, M.Strickland, Phys.Rev. C88 (2013) 024903

W.Florkowski, R.Ryblewski, M.Strickland, forthcoming

Authors: Dr STRICKLAND, Michael (Kent State University); Mr RYBLEWSKI, Radoslaw (Kent State University); Prof. FLORKOWSKI, Wojciech (IFJ PAN / UJK)

Presenter: Mr RYBLEWSKI, Radoslaw (Kent State University)

Contribution ID: **4** Type: **not specified**

The photon flow puzzle

Friday 7 March 2014 16:45 (25 minutes)

I will report on the discussions at the EMMI Rapid Reaction Task Force meeting on the "Photon flow puzzle" that happens at GSI the week before this meeting. The state of the art in numerical simulations and experimental data will be discussed, as well as some possibly interesting future measurements.

Author: Prof. HEINZ, Ulrich (The Ohio State University)

Co-author: Mr SHEN, Chun (The Ohio State University)

Presenter: Prof. HEINZ, Ulrich (The Ohio State University)

Contribution ID: **5** Type: **not specified**

Viscous hydrodynamics for systems undergoing strongly anisotropic expansion

Saturday 8 March 2014 11:05 (25 minutes)

The collective expansion in relativistic heavy-ion collisions is initially highly anisotropic. Due to viscosity, this leads to strongly deformed local momentum distributions which invalidates the standard viscous hydrodynamic expansion around a local equilibrium distribution, causing a breakdown of viscous fluid dynamics à la Israel and Stewart at early times. We have developed an improved formulation of viscous hydrodynamics [1] that is based on an expansion around a spheroidally deformed local momentum distribution. A spheroidal local momentum distribution leads to the "anisotropic hydrodynamics"developed earlier by Martinez and Strickland, which accounts non-perturbatively for the resulting large early-time anisotropy between the longitudinal and transverse pressures. By allowing in our new treatment for additional small deviations of the local momentum distribution from spheroidal symmetry, we arrive at a complete formulation of second-order viscous hydrodynamics in which the large longitudinal-transverse momentum anisotropy is treated non-perturbatively à la Martinez and Strickland while the smaller remaining viscous stress components are treated perturbatively à la Israel and Stewart. We perform a test of the approach for a system undergoing boost-invariant longitudinal expansion without transverse expansion which maximizes the longitudinal-transverse pressure anisotropy. For this system the Boltzmann equation can be solved exactly in the relaxation-time approximation, allowing for a quantitative test of effective macroscopic hydrodynamic theories. We find that the viscous anisotropic hydrodynamic framework ("vaHydro") significantly outperforms all other available hydrodynamic descriptions, for both small and large values of the shear viscosity eta/s. We expect vaHydro to provide a superior description also after including transverse expansion and to allow for an earlier matching of pre-equilibrium dynamics to hydrodynamics, due to the superior ability of vaHydro to handle the large differences in longitudinal and transverse expansion rates at early times.
[1] D. Bazow, U. Heinz, M. Strickland, arXiv:1311.6720, Phys. Rev. C, in press.

Author: Mr BAZOW, Dennis (The Ohio State University)

Co-author: Prof. HEINZ, Ulrich (The Ohio State University)

Presenter: Mr BAZOW, Dennis (The Ohio State University)

Contribution ID: **6** Type: **not specified**

Thermal photons as a quark-gluon plasma thermometer revisited

Friday 7 March 2014 16:20 (25 minutes)

Photons are a penetrating probe of the hot medium formed in heavy-ion collisions, but they are emitted from all collision stages. At photon energies below 2-3 GeV, the measured photon spectra are approximately exponential and can be characterized by their inverse logarithmic slope, often called "effective temperature"T_eff. Modeling the evolution of the radiating medium hydrodynamically, we analyze the factors controlling the value of T_eff and how it is related to the evolving true temperature T of the fireball. We find that at RHIC and LHC energies most photons are emitted from fireball regions with T ~ T_c near the quark-hadron phase transition, but that their effective temperature is significantly enhanced by strong radial flow. Although a very hot, high pressure early collision stage is required for generating this radial flow, we demonstrate that the experimentally measured large effective photon temperatures T_eff > T_c, taken alone, do not prove that any electromagnetic radiation was actually emitted from regions with true temperatures well above T_c. We explore tools that can help to provide additional evidence for the relative weight of photon emission from the early quark-gluon and late hadronic phases. We find that the recently measured centrality dependence of the total thermal photon yield requires a larger contribution from late emission than presently encoded in our hydrodynamic model.

Author: Mr SHEN, Chun (The Ohio State University)

Co-authors: Prof. GALE, Charles (McGill University); Mr PAQUET, Jean-Francois (McGill University); Prof. HEINZ, Ulrich (The Ohio State University)

Presenter: Mr SHEN, Chun (The Ohio State University)

Contribution ID: **7** Type: **not specified**

Next to eikonal corrections to the shock wave in QCD

Saturday 8 March 2014 15:25 (25 minutes)

In the high energy limit, scattering processes can be described within the eikonal approximation, neglecting contributions which are power-suppressed at high energy. In the case of processes involving a large nuclear target, like pA or AA collisions, the Color Glass Condensate effective theory (CGC) is one of the most convenient formalisms based on the eikonal approximation. So far, the phenomenological studies at LHC and RHIC have been focused on particle production of large albeit finite energies. So it is not clear to what extent the eikonal approximation is completely reliable. We develop a method to expand the gluon propagator in a strong background field beyond the eikonal approximation and study the next-to-eikonal contributions due to finite length of the target (or due to the large but finite energy of the projectile). This allows one to calculate the power-suppressed corrections with respect to the CGC which are enhanced by the width of the target. As a first example, we apply this expansion to single inclusive gluon production as well as the single transverse spin asymmetry in pA collisions to study these observables at next-to-eikonal accuracy. We find that the first corrections (linear in the width of the target) vanish for the unpolarized single inclusive gluon cross-section, making the CGC more reliable than expected, but dominate in the case of some single-transverse-spin asymmetries.

Author: Dr MARTINEZ GUERRERO, Mauricio (Ohio State University)

Co-authors: Dr SALGADO, Carlos (Universidade de Santiago de Compostela); Dr BEUF, Guillaume (Universidade de Santiago de Compostela); Dr ARMESTO, Nestor (Universidade de Santiago de Compostela); Dr ALTINOLUK, Tolga (Universidade de Santiago de Compostela)

Presenter: Dr MARTINEZ GUERRERO, Mauricio (Ohio State University)

Contribution ID: **8** Type: **not specified**

Azimuthally-sensitive two-pion interferometry in U+U collisions at STAR

Saturday 8 March 2014 08:55 (25 minutes)

Collisions between uranium nuclei have been produced in the Relativistic Heavy Ion Collider and measured in the STAR detector. Due to the prolate deformation of the nuclei, fully overlapping U+U collisions offer the opportunity to produce highly anisotropic participant zones, similar in shape to mid-central Au+Au collisions, but with twice the size. The larger fireball should be characterized by a long time over which it collectively evolves from its non-trivial initial shape to its final one. The final-state anisotropy of zero-spectator collisions in \textit{momentum} space (v_n) is under active study. We will present a preliminary analysis of the \textit{coordinate}-space anisotropy, measured via azimuthally-sensitive two-pion interferometry (”HBT”) of full-overlap collisions, performed differentially in the reduced flow parameter q_2 in U+U collisions at $\sqrt{s_{NN}}$ = 193 GeV.

Author: Mr CAMPBELL, John (The Ohio State University)

Presenter: Mr CAMPBELL, John (The Ohio State University)

Contribution ID: **9** Type: **not specified**

Excited State(2S) Charmonium Production from B-hadron Decay

Friday 7 March 2014 18:00 (25 minutes)

In comparison with J/\psi, the excited charmonium 2S-state ψ' is loosely bounded and its yield is dominantly from the B-hadron decay. Based on the transport approach, we study the double ratio of N(ψ')/N(J/ψ) from A+A collisions to that from p+p collisions at LHC energy, where N means the yield.
We found that different from bound charmonium state J/ψ whose inclusive yield and averaged transverse momentum are dominated by charm pair recombination at LHC, both the primordial production in the initial stage and the charm pair regeneration in the hot medium are not significant for ψ' production in heavy ion collisions at LHC. And the double ratio in semi-central and central collisions is controlled by the B decay.

Author: Mr CHEN, Baoyi (Tsinghua University)

Co-authors: Mr ZHOU, Kai (Tsinghua University); Prof. ZHUANG, Pengfei (Tsinghua University); Dr LIU, Yunpeng (Tex A&M University)

Presenter: Mr CHEN, Baoyi (Tsinghua University)

Contribution ID: **10** Type: **not specified**

TBD

Saturday 8 March 2014 09:45 (20 minutes)

TBD

Author: Mr SALZWEDEL, Jai (The Ohio State University)

Presenter: Mr SALZWEDEL, Jai (The Ohio State University)

Contribution ID: **11** Type: **not specified**

Free-streaming limit of pre-equilibrium evolution in heavy-ion collisions

Saturday 8 March 2014 11:30 (25 minutes)

Pre-equilibrium evolution of heavy-ion collision is an open problem. Now most hydrodynamic simulations for heavy-ion assume the system thermalizes immediately after the collision. In our study, we explore the free-streaming limit and assume the system thermalizes at the end of free-streaming. At the end of free-streaming, by solving collisionless Boltzmann equation, we find the gluon distribution function and thus calculate energy momentum tensor. Then we demand the system to be thermalized at this "thermalization time" and do Landau matching to get a consistent set of initial conditions. We use initial conditions corresponding to different thermalization times to run VISHNew2+1 hydrodynamic code. Finally we construct the anisotropies from azimuthal transverse energy distribution to qualify how the anisotropy flows change with different thermalization times.

Author: Mr LIU, Jia (The Ohio State University)

Co-authors: Mr SHEN, Chun (The Ohio State University); Prof. HEINZ, Ulrich (The Ohio State University)

Presenter: Mr LIU, Jia (The Ohio State University)

Contribution ID: **12** Type: **not specified**

The Heavy Flavor Tracker of STAR experiment at RHIC

Saturday 8 March 2014 16:20 (25 minutes)

We will briefly discuss the commissioning and heavy flavor physics program of the new pixel tracker of STAR experiment at RHIC.

Author: Prof. MARGETIS, Spyridon (Kent State University)

Presenter: Dr BOUCHET, JONATHAN (KENT STATE UNIVERSITY)

Contribution ID: **13** Type: **not specified**

Global alignment methods of the inner silicon tracker (HFT) of the STAR experiment at RHIC

I will present a brief overview of the global alignment procedures developed for the Heavy Flavor Tracker, their estimated performance characteristics and application to data collected from a PIXEL prototype beam test in 2013.

Author: Mr LOMNITZ, Michael (Kent State University)

Presenter: Mr LOMNITZ, Michael (Kent State University)

Contribution ID: **14** Type: **not specified**

TBD

Saturday 8 March 2014 09:20 (25 minutes)

TBD

Author: Mr STEINPREIS, Matthew (The Ohio State University)

Presenter: Mr STEINPREIS, Matthew (The Ohio State University)

Contribution ID: **15** Type: **not specified**

Two-Gluon Correlations in Heavy-Light Ion Collisions

Saturday 8 March 2014 15:00 (25 minutes)

We derive the cross-section for two-gluon production in heavy-light ion collisions in the saturation/Color Glass Condensate framework. This is the first-ever two-gluon production calculation including saturation effects to all orders in one of the nuclei (heavy ion) along with a single saturation correction in the projectile (light ion). The calculation of the correlation function predicted (qualitatively) two identical ridge-like correlations, near- and away-side. This prediction was later supported by experiment findings. Concentrating on the energy and geometry dependence of the correlation functions we find that the correlation function is nearly center-of-mass energy independent. The geometry dependence of the correlation function leads to an enhancement of near- and away-side correlations for the tip-on-tip U+U collisions when compared with side-on-side U+U collisions, an exactly opposite behavior from the correlations generated by the elliptic flow of the quark-gluon plasma.

Author: WERTEPNY, Douglas (The Ohio State University)

Presenter: WERTEPNY, Douglas (The Ohio State University)

Contribution ID: **16** Type: **not specified**

3rd order HBT and Event-by-event hydrodynamics

Saturday 8 March 2014 08:30 (25 minutes)

HBT (Hanbury-Brown—Twiss) interferometry is an observational technique which plays an essential role in the extraction of the geometric and flow properties of heavy-ion collisions. In particular, azimuthally-sensitive HBT studies convey information about deformations and anisotropies in the structure of the freeze-out surface. One aspect of these studies, which is not at present well understood, is how they are affected by the presence of event-by-event fluctuations in the initial state of the fireball. Such fluctuations may, for instance, contribute to odd Fourier moments of the HBT radii (in Au+Au collisions) which should otherwise vanish by symmetry
In a recent analysis (arXiv:1306.1485) of HBT interferometry with respect to the triangular flow plane, we found, based on Gaussian model studies of the emission function, that triangular oscillations of the HBT radii could result from the build-up of triangular flow in the quark-gluon plasma (QGP) prior to freeze-out. In this talk, we review the key results of this analysis, and discuss ongoing efforts to generalize these results to fully hydrodynamic simulations of heavy-ion collisions on an event-by-event basis. We present our findings for the specific case of Au+Au @ 200 AGeV with identical pion correlations, using 2+1D hydrodynamic code (VISH2+1) with fluctuating initial conditions specified by the Glauber model, and then conclude by comparing our results with recent PHENIX data.

Author: Mr PLUMBERG, Christopher (The Ohio State University)

Co-authors: Mr SHEN, Chun (The Ohio State University); Prof. HEINZ, Ulrich (The Ohio State University)

Presenter: Mr PLUMBERG, Christopher (The Ohio State University)

Contribution ID: **17** Type: **not specified**

Predictions of hadronic observables in Pb+Pb collisions at √ sN N = 2.76 TeV from a hadronic rescattering model

Friday 7 March 2014 14:30 (25 minutes)

We employ a simple kinematic model based on the superposition of p+p collisions, relativistic geometry, and final-state hadronic rescattering to predict a number of hadronic observables in √sNN = 2.76 TeV Pb+Pb collisions. The current study uses a model similar to [Humanic10], but includes an additional procedure ("squeeze procedure") to better fit the predicted pseudorapidity distribution to the experimental data. In addition, we vary to model hadronization time (τ = 0.1, 0.2, 0.3 fm/c) to gain a better understanding of our systematic errors. We find that the simple model fits the data well qualitatively, and in many cases quantitatively. Furthermore, the model is found to be robust in the sense that the squeeze procedure and (limited) variation in the hadronization proper time do not significantly affect our results.

Authors: Mr BUXTON, Jesse (The Ohio State University Department of Physics); Dr HUMANIC, Thomas (The Ohio State University)

Presenter: Mr BUXTON, Jesse (The Ohio State University Department of Physics)

Contribution ID: **18** Type: **not specified**

Lambda Polarization in Heavy Ion Collisions

Friday 7 March 2014 15:20 (25 minutes)

Non-central heavy ion collisions provide a system with non-zero net angular momentum. If the spin degrees of freedom equilibrate in the fireball, then emitted particles are expected to exhibit a net spin. Lambda baryons are self analyzing, meaning proton daughters are emitted preferentially in the direction of the spin, making the Λ an ideal candidate for the determination of the net spin of the produced particles. Net Λ polarization has been predicted several times - Becattini et. all (arXiv:1304.4427v2 [nucl-th] 10 Jul 2013) recently predicted a maximum polarization of 7-9% via hydro –but it has not yet been observed. We will present preliminary measurements of net Λ polarization from STAR.

Author: UPSAL, Isaac (Ohio State University)

Presenter: UPSAL, Isaac (Ohio State University)

Contribution ID: **19** Type: **not specified**

Comparing jet-like azimuthal di-hadron correlations to a hadronic rescattering model

Friday 7 March 2014 14:55 (25 minutes)

A comparison of azimuthal di-hadron correlation yield ratios is made between a simple rescattering model and experimental p+p and Pb+Pb data taken with the ALICE detector at $\sqrt{s_{NN}}$ = 2.76TeV. Event by event azimuthal correlations are created from hadrons associated with high-p_T trigger particles, producing peaks in the per-trigger associated multiplicity distribution at $\Delta\phi = 0, \pi$ which is evidence of a jet-like behavior. The integrated yield of the front and back peaks is taken for p+p and various centralities of Pb+Pb collisions. Ratios of these yields are made between Pb+Pb and p+p, the results of which are compared to similar measurements done at ALICE.

Author: KUBERA, Andrew (The Ohio State University)

Presenter: KUBERA, Andrew (The Ohio State University)

Contribution ID: **20** Type: **not specified**

Rapidity evolution of Wilson lines at the next-to-leading order

Saturday 8 March 2014 14:35 (25 minutes)

Scattering amplitudes of proton-Nucleus or Nucleus-Nucleus collisions at high-energy are described by matrix elements of Wilson line operators - infinite gauge factors ordered along the straight lines of the fast moving particles. The energy dependence of such amplitudes is described by the evolution equation of Wilson lines with respect to the rapidity parameter - the Balitsky-JIMWLK evolution equation. Most of the current phenomenology of high-energy and high-density QCD is based on the leading-order evolution equation with only running coupling corrections. In my talk I will present the derivation of the Balitsky-JIMWLK evolution equation at the next-to-leading order.

Author: CHIRILLI, Giovanni Antonio (Ohio State University)

Presenter: CHIRILLI, Giovanni Antonio (Ohio State University)

Contribution ID: **21** Type: **not specified**

Search for a First-Order QCD Phase Transition

Saturday 8 March 2014 17:10 (25 minutes)

The Beam Energy Scan (BES) program at the Relativistic Heavy-Ion Collider has several physics goals, all related to understanding the phase diagram for QCD matter. One of these goals is to search for signatures of a first-order phase transition from a hadron gas to quark gluon plasma. It is generally accepted that QGP is produced at the top RHIC energies (and at the LHC), and there is much evidence from both theory and experiment that the hadron to QGP transition at these energies, where the baryon chemical potential is near zero, is a smooth crossover. Lower beam energies probe larger values of the baryon chemical potential, and there are predictions that signatures of a first-order phase transition might be observed in this region. This talk will focus on a search based on directed flow of identified particles, especially baryons like protons and Lambda hyperons, produced in AuAu collisions at BES energies.

Author: SHANMUGANATHAN, Prashanth (Kent State University)

Presenter: SHANMUGANATHAN, Prashanth (Kent State University)

Contribution ID: **22** Type: **not specified**

Results of the commissioning of the inner silicon tracker (HFT) of the STAR experiment at RHIC

Saturday 8 March 2014 16:45 (25 minutes)

Last year, the STAR experiment at RHIC has installed a prototype of the Heavy Flavor Tracker (HFT). The motivation of the HFT detector is to enhance STAR physics capability in measuring heavy quark production with the use of direct topological reconstruction of charmed hadrons.
In this talk we will discuss aspects of the commissioning of the HFT detector in its first data taking deployment.

Author: Dr BOUCHET, JONATHAN (KENT STATE UNIVERSITY)

Presenter: Mr LOMNITZ, Michael (Kent State University)

Contribution ID: **23** Type: **not specified**

The fluidity of interacting hadron gas

Saturday 8 March 2014 11:55 (25 minutes)

The shear viscosity η and entropy density s of a hadron gas with zero baryon number density are calculated using the Chapman-Enskog and virial expansion approaches, respectively. Interactions are included via the K-matrix parametrization of cross sections preserving the unitarity of the S-matrix. In the four component mixture (π − K − N − η), a total of 57 resonances up to 2 GeV mass are included. Interactions forming resonances reduce the magnitude of η and increase s, both effects serving to progressively reduce η/s as the temperature nears the QCD phase transition temperature.

Author: Dr WIRANATA, Anton (Central China Normal University/LBL)

Co-authors: Prof. PRAKASH, Madappa (Ohio University); Prof. KOCH, Volker (LBL); Prof. WANG, Xin-Nian (LBL)

Presenter: Dr WIRANATA, Anton (Central China Normal University/LBL)

Contribution ID: **24** Type: **not specified**

Counting Quarks in the QGP

Friday 7 March 2014 14:05 (25 minutes)

Charge correlations provide the means to infer the quark chemistry of the super-hadronic matter created in a heavy-ion collisions. I will show how results from STAR appear confirm the creation of a chemically equilibrated QGP.

Author: Mr PRATT, Scott (MSU)

Presenter: Mr PRATT, Scott (MSU)

Contribution ID: **25** Type: **not specified**

Sat. Welcome and PHENIX Photon Measurements now and in the future.

Saturday 8 March 2014 08:15 (15 minutes)

I will present a short update on my group's work in two-particle correlations work, as well as work related to the sPHENIX upgrade.

Author: FRANTZ, Justin (Ohio University)

Presenter: FRANTZ, Justin (Ohio University)

Contribution ID: **26** Type: **not specified**

Official welcome to the meeting!

Friday 7 March 2014 14:00 (5 minutes)

Presenter: Dr STRICKLAND, Michael (Kent State University)

Contribution ID: **27** Type: **Talk**

Measurement of Nuclear Modification of Jet Production in p-Pb collisions at s_NN = 5.02 TeV with the ALICE detector at the LHC

Friday 7 March 2014 17:35 (25 minutes)

Proton-nucleus collisions are utilized to distinguish between initial and final state effects, which is vital for establishing a baseline for heavy-ion collisions. One of the crucial reference measurements is the jet nuclear modification factor (R_pPb) in p-Pb collisions at s_NN = 5.02 TeV at the LHC. Jets in ALICE are reconstructed using the anti-k_T jet finding algorithm combining information from the Time Projection Chamber (TPC), Inner Tracking System, and the Electromagnetic Calorimeter (EMCal) to measure the charged and neutral jet constituents. In this talk, we discuss the systematic uncertainties on the jet energy scale using the TPC and EMCal in ALICE. Furthermore various techniques to estimate the underlying event in p-Pb collisions will be presented. Simulation studies will also be presented.

Author: Mr YALDO, Chris (Wayne State University)

Presenter: Mr YALDO, Chris (Wayne State University)

Track Classification: Experiment

Contribution ID: **28** Type: **Talk**

Centrality dependence of transverse momentum correlations in Pb-Pb sqrt(sNN) = at 2.76 TeV in ALICE at the LHC

Saturday 8 March 2014 17:35 (25 minutes)

Two-particle correlations provide information about particle production mechanisms in heavy-ion collisions.
We report on results of transverse momentum dierential two particle correlations in Pb-Pb collisions at
p
sNN = 2.76 TeV measured with the ALICE detector at the LHC. Correlation functions for unidentied
++, +⊠ and ⊠⊠ charged particle pairs as a function of pair azimuthal and pseudo-rapidity dierences are measured. We study their evolution with collision centrality. We nd that pTpT correlation shapes
exhibit a strong centrality dependence in Pb-Pb collisions. The momentum correlation values are everywhere
positive, indicating that both particles from one pair are more likely to have a momentum above or below
the average transverse momentum in an event ensemble. We further study the Fourier decomposition of the
correlation function dependence on as a function of for dierent collision centralities.

Author: Dr PUJAHARI, prabhat (Wayne State University)

Presenter: Dr PUJAHARI, prabhat (Wayne State University)

Track Classification: Experiment