

HCBM 2010 - Hot and Cold Baryonic Matter 2010

Abstracts book

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Abstract ID : 0

Nonadditive Entropy and Nonextensive Statistical Mechanics - Concepts and Applications

Content :

The realm of Boltzmann-Gibbs statistical mechanics, based on the standard additive entropy, essentially concerns ergodic systems, Markovian-like processes, linear Fokker-Planck equations, exponential behaviors of relevant physical, geometrical and dynamical quantities, the central limit theorem. What can be done when such simplifying hypothesis are not satisfied? The nonadditive entropy S_q , and its associated nonextensive statistical mechanics, precisely address a wide class of such anomalous situations, namely whenever power-law behaviors replace the traditional exponential behaviors. A brief review will be given of the central concepts, and various applications will be exhibited, in particular those concerning high energy physics. BIBLIOGRAPHY: (i) C. Tsallis, Introduction to Nonextensive Statistical Mechanics - Approaching a Complex World (Springer, New York, 2009); (ii) C. Tsallis, Entropy, in Encyclopedia of Complexity and Systems Science (Springer, Berlin, 2009); (iii) S. Umarov, C. Tsallis, M. Gell-Mann and S. Steinberg, J. Math. Phys. 51, 033502 (2010); (iv) <<http://tsallis.cat.cbpf.br/biblio.htm>><http://tsallis.cat.cbpf.br/biblio.htm>

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Track classification :

Contribution type : --not specified--

Submitted by : Prof. TSALLIS, Constantino

Submitted on Saturday 20 March 2010

Last modified on : Sunday 18 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 1

The nuclear liquid-gas phase transition at large N_c

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Track classification :

Contribution type : --not specified--

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Submitted on Monday 12 April 2010

Last modified on : Sunday 18 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 2

The Bjorken scaling and nucleon mass modifications in dense Nuclear Matter.

Content :

Our model calculations performed in the frame of relativistic mean field (RMF) approach shows how important are the modifications of nucleon mass (particularly for those models with stiff Equation of State (EoS)). They allow to explain the EMC effect in saturation and restore the momentum sum rule badly violated by the nuclear parton structure in nuclear medium for finite pressure. The finite pressure corrections emerges from Hugenholtz-van Hove theorem of nuclear matter. The presented analysis of the nuclear distribution function in the Bjorken limit ask to modify the nucleon mass (consistent with deeply inelastic scattering) above the saturation point and to solve modified RMF equations. In the presented work we argue that nucleon structure function above saturation point has the same form as in the saturated nuclear matter. Consequently the decrease on nucleon mass was obtained making the EoS softer. This changes the compressibility K ; for example from $K=540\text{MeV}$ to 300MeV in Walecka model. Also the modified EoS in this model is close to extensive DBHF calculations with Bonn potential. However our model - an extension of nuclear RMF, has no additional parameters.

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Track classification :

Contribution type : --not specified--

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Submitted on Thursday 29 April 2010

Last modified on : Thursday 29 April 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 3

Nonextensive critical effects in relativistic nuclear mean field models

Content :

The critical phenomena in strongly interaction matter are generally investigated using the mean-field model and are characterized by well defined critical exponents. However, such models provide only average properties of the corresponding order parameters and neglect altogether their possible fluctuations. Also the possible long range effect are neglected in the mean field approach. Here we investigate the critical behavior in the nonextensive version of the Nambu–Jona-Lasinio model (NJL). It allows to account for such effects in a phenomenological way by means of a single parameter q , the nonextensivity parameter. In particular, we show how the nonextensive statistics influence the region of the critical temperature and chemical potential in the NJL mean field approach.

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Contribution type : --not specified--

Submitted by : Prof. WILK, Grzegorz

Submitted on Thursday 29 April 2010

Last modified on : Thursday 29 April 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 4

Meson fluctuations and thermodynamics of the Polyakov loop extended quark-meson model.

Content :

Thermodynamics and the phase structure of the Polyakov loop-extended two flavor chiral quark-meson model (PQM) are explored. The analysis of the PQM model is based on the functional renormalization group (FRG) method. An appropriate truncation of the effective action with quarks coupled to background gluonic fields is introduced. Within this scheme, we derive the renormalization group flow equation for the scale-dependent thermodynamic potential at finite temperature and density in the presence of a symmetry breaking external field. The influence of fluctuations and of the background gluon field on the properties of net-quark number density fluctuations and their higher moments is explored. We study the dependence of the kurtosis of quark number fluctuations on the pion mass and show that, in the presence of a symmetry breaking term, the fluctuations lead to a smoothing of observables near the crossover transition.

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Contribution type : --not specified--

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Submitted on Friday 07 May 2010

Last modified on : Friday 07 May 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 5

Collective flow and mach cones at RHIC

Content :

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Track classification :

Contribution type : --not specified--

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Submitted on Wednesday 12 May 2010

Last modified on : Wednesday 12 May 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 6

Flow-Driven Conical Emission in Ultrarelativistic Heavy-Ion Collisions

Content :

We use (3+1)-dimensional hydrodynamic simulations to describe the propagation of a jet through an opaque medium and to investigate the underlying jet-medium interactions. The impact of different energy and momentum loss scenarios, of different jet velocities, and system sizes are analyzed. We will discuss if the particle correlations measured at the Relativistic Heavy Ion Collider (RHIC) which show a conical shape are a clear signal for the creation of a Mach cone. It is demonstrated that radial expansion as well as the use of full hydrodynamics introduces important corrections to the structures seen in the linearized description.

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Presenter : Dr. BETZ, Barbara (Columbia University)

Track classification :

Contribution type : --not specified--

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Submitted on Friday 28 May 2010

Last modified on : Friday 28 May 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 46

Critical opalescence - an optical signature of the QCD critical point

Content :

Four possible scenarios are considered for a transition from a quark-gluon matter to hadronic matter, and their corresponding correlation signatures are discussed. Four criteria are highlighted for a definitive experimental search for a QCD critical point. An old-new experimental measure, the optical opacity (or its inverse the nuclear attenuation length) is determined, in terms of a combination of nuclear suppression factors and a measurement of the relevant fireball length scales. Length scale estimates using either the Hanbury Brown -- Twiss radii or that of the initial nuclear geometry for measurements of optical opacity with respect to the reaction plane yield, somewhat surprisingly, nearly the same nuclear attenuation length in 0-5 % most central 200 GeV Au+Au collisions, corresponding to 2.9 ± 0.3 fm. The necessity and the possibility of measuring critical exponents is also discussed in the context of determination of the universality class of the QCD critical point. Critical opalescence is proposed to locate such a critical point on the QCD phase diagram, corresponding to a maximum of optical opacity in heavy ion experiments. These ideas will be discussed in the context of the current low energy scan program at RHIC and new possibilities at the upcoming FAIR facility.

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Track classification :

Contribution type : --not specified--

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Submitted on Tuesday 01 June 2010

Last modified on : Tuesday 01 June 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 47

Hybrid approaches to heavy ion collisions and future perspectives

Content :

We discuss recent developments in the area of hybrid approaches to the simulation of heavy ion reactions at relativistic energies. Focus will be on the exploration of different equations of state and potential signature of the QGP. The talk will also address some open questions for future developments, like multi-particle interactions and hadronisation.

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Track classification :

Contribution type : --not specified--

Submitted by : Prof. BLEICHER, Marcus

Submitted on Monday 21 June 2010

Last modified on : Monday 21 June 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 48

The Compressed Baryonic Matter experiment at FAIR

Content :

The Compressed Baryonic Matter (CBM) experiment [1] is being planned at the international research center FAIR [2], under realization next to the GSI laboratory in Darmstadt, Germany. Its physics programme addresses the QCD phase diagram in the region of highest net baryon densities. Of particular interest are the expected first order phase transition from partonic to hadronic matter, ending in a critical point, and modifications of hadron properties in the dense medium as a signal of chiral symmetry restoration.

Laid out as a fixed-target experiment at the double-ring synchrotrons SIS-100/300, providing magnetic bending power of 100 and 300 T/m, the CBM detector will record both proton-nucleus and nucleus-nucleus collisions at beam energies up to 45A GeV. Hadronic, leptonic and photonic observables have to be measured with large acceptance. The nuclear interaction rates will reach up to 10 MHz to measure extremely rare probes like charm near threshold. Two versions of the experiment are being studied, optimized for either electron-hadron or muon identification, combined with silicon detector based charged-particle tracking and micro-vertex detection. The research programme will start at SIS-100 with ion beams between 2 and 11A GeV, and protons up to energies of 29 GeV using the HADES detector and an initial configuration of the CBM experiment.

The CBM physics requires the development of novel detector systems, trigger and data acquisition concepts as well as innovative real-time reconstruction techniques. Progress with feasibility studies of the CBM experiment and the development of its detector systems will be discussed.

[1] www-cbm.gsi.de

[2] www.gsi.de/fair/

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Track classification :

Contribution type : --not specified--

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Submitted on Monday 21 June 2010

Last modified on : Monday 21 June 2010

Comments :

for the CBM Collaboration

Status : ACCEPTED

Track judgments :

Abstract ID : 49

Multi-particle interactions within UrQMD

Content :

A mechanism for locally density-dependent dynamic parton rearrangement and fusion has been implemented into the Ultra-relativistic Quantum Molecular Dynamics (UrQMD) approach. The same mechanism has been previously built in the Quark Gluon String Model (QGSM). This rearrangement and fusion approach based on parton coalescence ideas enables the description of multi-particle interactions, namely $3 \rightarrow 3$ and $3 \rightarrow 2$, between (pre-)hadronic states in addition to standard binary interactions. The UrQMD model (v2.3) extended by these additional processes allows to investigate implications of multi-particle interactions on the reaction dynamics of ultra-relativistic heavy-ion collisions. The mechanism, its implementation and first results of this investigation, e.g. implications on the kinetic equilibration and on measurable observables like spectra of final hadrons, will be presented and discussed.

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Track classification :

Contribution type : --not specified--

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Submitted on Wednesday 23 June 2010

Last modified on : Wednesday 23 June 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 50

Absorption of phi mesons in proton-nucleus collisions

Content :

Recent experiments of the ANKE collaboration concerning the phi meson production in pA-reactions $p(2.83 \text{ GeV}) + C, Cu, Ag$ and Au are appropriate for the absorptive phi-N interaction within the transparency ratio. With the aim of analyzing the amount of phi absorption we applied our well confirmed transport model of Boltzmann-Uhling-Uhlenbeck (BUU) type on this scenario. The results seem to point to an absorption cross section of $18 \mu\text{m}^3 \text{ mb}$ only when accounting for secondary phi production processes as well as isospin asymmetry and ANKE acceptance conditions.

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Track classification :

Contribution type : --not specified--

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Submitted on Wednesday 07 July 2010

Last modified on : Wednesday 07 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 51

Cold quark stars from hot lattice QCD

Content :

Based on a quasiparticle model for β stable and electrically neutral deconfined matter we address the possibility of pure quark stars. The model is adjusted to recent hot lattice QCD results for 2+1 flavors with almost physical quark masses. Using stability and binding arguments general statements can be made concerning the existence of such compact stellar objects.

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Track classification :

Contribution type : --not specified--

Submitted by : Mr. SCHULZE, Robert

Submitted on Wednesday 07 July 2010

Last modified on : Wednesday 07 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 52

Influence of the Polyakov loop on the chiral phase transition in the two flavor chiral quark model

Content :

The chiral quark model consisting of the sigma and pion mesons and the constituent quarks propagating on the constant background of a temporal gauge field is solved at finite temperature and baryon chemical potential. Using an expansion in the number of flavors, both the chiral limit and the case with physical pion mass are studied. The location of the critical end point in the μ - T plane is determined using a tree-level fermion propagator and several approximations to the pion propagator.

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Track classification :

Contribution type : --not specified--

Submitted by : Dr. SZEP, Zsolt

Submitted on Friday 09 July 2010

Last modified on : Friday 09 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 53

Study of particle production coming from quark and gluon jets in proton-proton collisions

Content :

The study of particle production inside jets makes it possible to address the fragmentation properties of the leading parton depending on its flavour. We investigate whether different fragmentation properties of quarks and gluons affect identified particle spectra.

We present a systematic study of K^0 , p and π^0 production at RHIC, Tevatron and LHC energies. Through the study of various event shapes we can directly access the fragmentation properties of quark and gluon jets. We present MC estimate for the contribution of quark and gluon jets to individual particle species spectra, that can be compared to experimental results and test our current knowledge of the physics behind particle production inside jets. Where possible, we cross-check our results with existing data and further extend the study to higher energies.

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Track classification :

Contribution type : --not specified--

Submitted by : NO SURNAME, No Name

Submitted on Monday 19 July 2010

Last modified on : Monday 19 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 54

Second order dissipative fluid dynamics from kinetic theory

Content :

We present the derivation of the (second order) equations of relativistic dissipative fluid dynamics from kinetic theory using Grad's moment expansion and discuss its applicability in heavy-ion collisions.

Primary authors : Dr. MOLNAR, Etele (MTA KFKI RMKI)

Co-authors :

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Track classification :

Contribution type : --not specified--

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Submitted on Monday 19 July 2010

Last modified on : Monday 19 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 55

HBT radii from the UrQMD transport approach at different energies

Content :

We use the non-equilibrium transport approach Ultra-relativistic Quantum Molecular Dynamics (UrQMD) [1] to compute the dynamics of heavy ion collisions up to LHC energies. From this model we obtain directly the full phasespace distribution of all particles at the kinetic freeze out. By applying the Correlation After Burner (CRAB) [2] of Scott Pratt we extract the two-particle correlation function in three-dimensions. Using a gaussian parametrization we get the Hanbury-Brown Twiss (HBT) radii from these correlation functions which can be interpreted in terms of the space-time extension [3] of the particle-emitting source. A comparison between the spatial distribution at freeze out and the results from the HBT analysis will be presented. Correlation functions and HBT radii for a broad energy range will be shown.

[1] S. A. Bass et al., Prog. Part. Nucl. Phys. 41 (1998) 225.

[2] S. Pratt, CRAB version 3, <http://www.pa.msu.edu/~pratts/>

[3] S. Chapman et al., Phys. Rev. Lett. 74 (1995) 4400

Primary authors : Mr. GRäF, Gunnar (Frankfurt Institute for Advanced Studies (FIAS), University of Frankfurt)

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Track classification :

Contribution type : --not specified--

Submitted by : Mr. GRäF, Gunnar

Submitted on Monday 19 July 2010

Last modified on : Monday 19 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 59

Measurements of hadron production at CMS

Content :

Measurements of hadron production in proton-proton collisions at $\sqrt{s} = 0.9, 2.36$ and 7 TeV, recorded with the CMS detector. To be extended.

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Track classification :

Contribution type : --not specified--

Submitted by : Dr. SIKLÉR, Ferenc

Submitted on Monday 19 July 2010

Last modified on : Monday 19 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 60

Quark Number Scaling in Fluid Dynamics and Hadronization via Quarkyonic Matter

Content :

The observed Constituent Quark Number Scaling of the flow parameter, v_2 , for different mesons and baryons is instinctively a proof for collective flow development in quark gluon plasma. Fluid dynamical models assuming phase and chemical equilibrium during all stages cannot account for the observed scaling, while hybrid models with recombination into hadrons can in a limited p_t -range. However, the scaling with E_t is not obvious to explain in this scenario either. We follow the rapid and simultaneous hadronization of QGP via Quarkyonic matter dynamically, where partons gain weight and the perturbative vacuum field disappear simultaneously. We show that this dynamical process influences the flow observables, and scaling studies may provide an insight into the features and dynamics of this intermediate phase between ideal QGP and Hadronic Matter.

Primary authors : Prof. CSERNAI, Laszlo P. (University of Bergen)

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Presenter : Prof. CSERNAI, Laszlo P. (University of Bergen)

Track classification :

Contribution type : --not specified--

Submitted by : NO SURNAME, No Name

Submitted on Monday 19 July 2010

Last modified on : Monday 19 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 61

Energy and system-size dependence of the chiral magnetic effect

Content :

The energy dependence of the local CP violation in Au+Au and Cu+Cu collisions is estimated within a simple phenomenological model. Predictions for LHC and SPS energies are given. Evolution of the magnetic field in heavy-ion collisions is discussed also.

Primary authors : Prof. TONEEV, Viacheslav (Dubna, Joint Institute for Nuclear Research)

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Track classification :

Contribution type : --not specified--

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Submitted on Wednesday 21 July 2010

Last modified on : Wednesday 21 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 62

Interplay between chiral and deconfinement phase transition

Content :

The interplay between chiral restoration and deconfinement phase transition is discussed. In the Polyakov-loop NJL model, the relation between the two phase transitions is much parameter dependent, the chiral restoration can happen earlier or latter than the deconfinement phase transition, also the two phase transitions can coincide with each other. We use the dressed Polyakov loop as an equivalent order parameter of deconfinement phase transition, and investigate the chiral and deconfinement phase transitions in the NJL model as well as in the framework of DSE, and we find that in the case of first order and second order phase transitions, the chiral phase transition always coincide with deconfinement phase transition, and in the case of crossover, the chiral transition temperature is always smaller than that of the deconfinement. Our result agrees with the lattice result from Wuppetal-Budapest group.

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Track classification :

Contribution type : --not specified--

Submitted by : Prof. HUANG, Mei

Submitted on Wednesday 21 July 2010

Last modified on : Wednesday 21 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 63

Hadron production in a parton cascade modell with non-additive energy composition

Content :

Identified particle spectra stemming from $pp \rightarrow hX$ and $AA \rightarrow hX$ reactions fit well to a cut-power law formula for various collision energies and wide transverse momentum range. This formula can be obtained as the equilibrium distribution of quasi particles having non-additive energy composition. Real nucleus collisions are however non-equilibrium processes. In this talk I discuss hadron production in a parton cascade modell with non-additive energy composition.

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Track classification :

Contribution type : --not specified--

Submitted by : URMOSY, Karoly

Submitted on Wednesday 21 July 2010

Last modified on : Wednesday 21 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 64

Towards Quantum Transport for Central Nuclear Reactions

Content :

Striving to develop a practical approach for nuclear collisions, based on nonequilibrium Green's functions, we start out by considering collisions of slabs in one dimension, within the mean-field approximation of the Green's-function method. In the latter case, the dynamics is self-consistently described in terms of a single-particle density-matrix for the colliding system. We concentrate on two issues of importance for the practical reaction simulations: on limiting the amount of information followed when simulating a reaction and on preparing the initial state for a reaction within the same methodology as for simulations. Regarding the second issue, we demonstrate that the mean-field ground-state may be arrived at by adiabatically switching on the mean-field interactions. We hope to be able to do the same for correlated states. Regarding the first issue above, we show that far off-diagonal elements of the density matrix, in the spatial representation, may be suppressed without affecting the evolution close to diagonal of the matrix. Those far-away elements represent entangled wavefunctions of nucleons emerging from a reaction. The growth in redundancy of information, with the progress of a reaction, appears to be closely tied to the expansion of the system. The only aspect of the system, for which the far-away elements appear to be crucial, is the time-reversal symmetry. Within the Wigner representation, the discarding of far-away elements of the matrix is equivalent to momentum smoothing of the Wigner function for the reaction. The findings bode well for the possibility of carrying out full three-dimensional calculations of collisions within the Green's function approach.

Primary authors : Prof. DANIELEWICZ, Pawel (NSCL/Cyclotron Laboratory, Michigan State University) ;
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Track classification :

Contribution type : --not specified--

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Submitted on Wednesday 21 July 2010

Last modified on : Wednesday 21 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 65

Holography vs Tomography of the Hot and Cold Baryonic Matter

Content :

The two major competing paradigms for jet-medium interactions at RHIC and LHC are perturbative pQCD and higher dimensional holographic hQCD.

I discuss why current RHIC data favor hQCD holography to pQCD tomography by a score of 2-to-1 as of today. hQCD does a remarkable robust job correlating bulk flow and heavy quark quenching observables while pQCD does a better job describing light quark tomography. Possible implications for the LHC jet-medium studies expected to start this November at CERN are discussed. Speculations about possible heavy baryon tomography are considered that could have relevance to future FAIR experiments.

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Track classification :

Contribution type : --not specified--

Submitted by : Prof. GYULASSY, Miklós

Submitted on Wednesday 21 July 2010

Last modified on : Wednesday 21 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 66

Propagation of vector-meson spectral-functions and dilepton production at SIS18 energies

Content :

The time evolution of vector-meson spectral-functions is studied within a kinetic theory approach.

We implement this formalism in a BUU type transport model.

Applications focus on ρ and ω mesons being important pieces for the interpretation of

the di-electron invariant mass spectrum measured by the HADES collaboration for the reaction C+C at 2 AGeV bombarding energy.

Since the evolution of the spectral functions is driven by the local density, the in-medium modifications are tiny for small collision systems within this approach, as the life time of the compressed stage is too short.

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Track classification :

Contribution type : --not specified--

Submitted by : Dr. WOLF, György

Submitted on Thursday 22 July 2010

Last modified on : Thursday 22 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 67

Charmonium production and elliptic flow in heavy ion collisions

Content :

Using a two-component model for J/Ψ production, which includes both from initial hard nucleon-nucleon scattering and from regeneration in the produced quark-gluon plasma, we have studied the nuclear modification factor RAA and elliptic flow v_2 of J/Ψ in Au+Au collision at $\sqrt{s_{NN}}=200$ GeV. For the expansion dynamics of produced hot dense matter, we have introduced a schematic fireball model with its transverse acceleration determined from the pressure gradient inside the fireball and azimuthally anisotropic expansion parameterized to reproduce measured v_2 of light hadrons. We assume that light hadrons freeze out at the temperature of 120 MeV while J/Ψ at 160 MeV, similar to, respectively, the kinetic and chemical freeze-out temperatures in the statistical model. For the properties of J/Ψ in the quark-gluon plasma, we use the perturbative QCD (pQCD) to calculate the screening mass between their charm quarks in the leading order and their dissociation cross sections up to the next-to-leading order. For the relaxation time of charm quarks in the quark-gluon plasma, it is also calculated in the leading order of pQCD. Modeling the effect of higher-order corrections in pQCD by introducing multiplicative constants to the dissociation cross section of J/Ψ and the elastic cross section of charm quarks, we find that their effects are small on the RAA of J/Ψ as they suppress the number of initially produced J/Ψ but enhance the number of regenerated ones. The higher-order corrections increase, however, the v_2 of J/Ψ . Our results suggest that studying the v_2 of J/Ψ provides the possibility to discriminate between the two J/Ψ production mechanisms from initial hard scatterings and from regeneration in the quark-gluon plasma.

Primary authors : Prof. KO, Che-ming (Texas A University)

Co-authors : Dr. SONG, Taesoo (Texas A University)

Presenter : Prof. KO, Che-ming (Texas A University)

Track classification :

Contribution type : --not specified--

Submitted by : Prof. KO, Che-ming Ko

Submitted on Thursday 22 July 2010

Last modified on : Thursday 22 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 68

Lattice gauge theory with fluctuating temperature

Content :

We study the possibility to implement the canonical Tsallis distribution for lattice field theory simulations. Formally, the application of the Tsallis distribution can be interpreted as introducing a fluctuating temperature. We give arguments for the approach and present our simulation method as well as our first numerical results in determining the equation of state for pure SU(2) lattice gauge fields.

Primary authors : Prof. SCHRAM, Zsolt (University of Debrecen)

Co-authors : Prof. BIRÓ, Tamás (MTA KFKI RMKI)

Presenter : Prof. SCHRAM, Zsolt (University of Debrecen)

Track classification :

Contribution type : --not specified--

Submitted by : Prof. SCHRAM, Zsolt

Submitted on Sunday 25 July 2010

Last modified on : Sunday 25 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 69

QCD Green's Functions and Phases of Strongly Interacting Matter

Content :

The knowledge of Landau gauge QCD Green's functions at zero temperature and density as well as their relation to confinement, dynamical chiral symmetry breaking, and the axial anomaly are briefly reviewed. The application of functional methods to the QCD phase transitions is discussed, and resulting properties of some phases are presented.

Primary authors : Prof. ALKOFER, Reinhard (Univ. Graz)

Co-authors :

Presenter : Prof. ALKOFER, Reinhard (Univ. Graz)

Track classification :

Contribution type : --not specified--

Submitted by : Prof. ALKOFER, Reinhard

Submitted on Sunday 25 July 2010

Last modified on : Sunday 25 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 73

Zero temperature properties of mesons in a vector meson extended linear sigma model

Content :

TBA

Primary authors : Dr. KOVÁCS, Péter (KFKI RMKI)

Co-authors : Prof. WOLF, Gyuri (KFKI RMKI)

Presenter : Dr. KOVÁCS, Péter (KFKI RMKI)

Track classification :

Contribution type : --not specified--

Submitted by : NO SURNAME, No Name

Submitted on Monday 26 July 2010

Last modified on : Monday 26 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 74

Facets of the QCD Phase Diagram

Content :

I will discuss various aspects of the QCD phase diagram and how they can be explored in actual experiments.

Primary authors : Dr. KOCH, Volker (LBNL)

Co-authors :

Presenter : Dr. KOCH, Volker (LBNL)

Track classification :

Contribution type : --not specified--

Submitted by : Dr. KOCH, Volker

Submitted on Tuesday 27 July 2010

Last modified on : Tuesday 27 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 76

Recent theoretical developments in the QCD phase diagram

Primary authors : Dr. WAMBACH, Jochen (TU-Darmstadt and GSI)

Co-authors :

Presenter :

Track classification :

Contribution type : --not specified--

Submitted by : Prof. WAMBACH, Jochen

Submitted on Tuesday 27 July 2010

Last modified on : Tuesday 27 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 77

Microsecond Universe to Neutron Star - LHC, RHIC onto FAIR

Content :

The universe, microseconds after the Big Bang consisted of Quarks, Gluons, leptons and photons. Possible remnants from that epoch can be MACHO type of dark objects about the size of the Jupiter. One partial source of dark energy could be the orphan quarks left over from that epoch. In a typical phase diagram early universe corresponds to low baryon density but very high temperature.

Neutron Stars on the other hand correspond to very high baryon density but low temperature. Recent work indicates a rich variety of layers of exotic matter with the serious possibility of quark matter in the core. LHC, RHIC & FAIR - What can we learn?

Primary authors : Prof. SINHA, Bikash (Variable Energy Cyclotron Centre, Dept. of Atomic Energy, 1/AF, Bidhan Nagar, Kolkata-700 064, India)

Co-authors :

Presenter : Prof. SINHA, Bikash (Variable Energy Cyclotron Centre, Dept. of Atomic Energy, 1/AF, Bidhan Nagar, Kolkata-700 064, India)

Track classification :

Contribution type : --not specified--

Submitted by : Prof. SINHA, Bikash

Submitted on Tuesday 27 July 2010

Last modified on : Tuesday 27 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 78

Significant in-medium η' mass reduction in $\sqrt{s_{NN}}=200$ GeV Au+Au collisions

Content :

PHENIX and STAR data on the intercept parameter of the two-pion Bose-Einstein correlation functions in $\sqrt{s_{NN}}=200$ GeV Au+Au collisions are analyzed in terms of six different models of hadronic multiplicities.

To describe this combined PHENIX and STAR dataset, an in-medium η' mass reduction of at least 200 MeV is needed, at the 99.9 % confidence level, in the considered model class.

The best description is achieved with an η' mass that is reduced from the 958 MeV vacuum value to an in-medium value of

$m_{\eta'} = 340^{+50}_{-60}$ (statistics) $^{+280}_{-140}$ (model) ± 42 (systematics) MeV. The system size, energy and centrality dependence of this η' mass reduction is also investigated and estimate is given on its extent.

Primary authors : Mr. VERTESI, Robert (MTA KFKI RMKI) ; Mr. CSORGO, Tamas (MTA KFKI RMKI, Harvard University) ; Mr. SZIKLAI, Janos (MTA KFKI RMKI)

Co-authors :

Presenter : Mr. VERTESI, Robert (MTA KFKI RMKI)

Track classification :

Contribution type : --not specified--

Submitted by : Mr. VERTESI, Robert

Submitted on Tuesday 27 July 2010

Last modified on : Tuesday 27 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 79

Dynamical equilibration of the strongly interacting parton-hadron matter

Content :

We study the kinetic and chemical equilibration in 'infinite' parton-hadron matter within the Parton-Hadron-String-Dynamics transport approach, which is based on a dynamical quasiparticle model for partons (DQPM) matched to reproduce lattice-QCD results - including the partonic equation of state - in thermodynamic equilibrium. The 'infinite' matter is simulated within a cubic box with periodic boundary conditions initialized at different baryon density (or chemical potential) and energy density. The transition from initially pure hadronic matter to partonic degrees of freedom occurs dynamically by interactions. Different thermodynamical correlations of the sQGP are addressed and discussed relative to a hadron resonance model.

Primary authors : Mr. OZVENCHUK, Vitalii (FIAS)

Co-authors : Dr. BRATKOVSAYA, Elena (ITP, Goethe University, Frankfurt) ; Dr. LINNYK, Olena (ITP, Goethe University, Frankfurt) ; Prof. CASSING, Wolfgang (ITP, Justus-Liebig University, Gissen)

Presenter : Mr. OZVENCHUK, Vitalii (FIAS)

Track classification :

Contribution type : --not specified--

Submitted by : Mr. OZVENCHUK, Vitalii

Submitted on Tuesday 27 July 2010

Last modified on : Tuesday 27 July 2010

Comments :

Poster presentation

Status : ACCEPTED

Track judgments :

Abstract ID : 81

Tsallis Distribution in High-energy Heavy Ion Collisions

Content :

Non-extensive thermodynamics is a novel approach to fields in high energy physics. The low and intermediate transverse momentum spectra are extremely well reproduced by the Tsallis-Pareto distribution however, the physical origin of the Tsallis parameter is still an unsettled question. Understanding hadronization processes in heavy-ion collisions requires more detailed tests, especially at high transverse momenta, where we are far from the thermal equilibrium state. In my talk I focus on parton fragmentation processes at the final state, I analyze whether the power-law-tailed fragmentation functions do overlap with Tsallis-Pareto energy distribution, reproducing experimental data.

Primary authors : Dr. BARNAFÖLDI, Gergely Gábor (MTA KFKI RMKI)

Co-authors :

Presenter : Dr. BARNAFÖLDI, Gergely Gábor (MTA KFKI RMKI)

Track classification :

Contribution type : --not specified--

Submitted by : Dr. BARNAFÖLDI, Gergely Gábor

Submitted on Wednesday 28 July 2010

Last modified on : Wednesday 28 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 82

Search for the Critical Point at RHIC

Primary authors : Dr. LACEY, Roy ()

Co-authors :

Presenter : Dr. LACEY, Roy ()

Track classification :

Contribution type : --not specified--

Submitted by : Prof. LACEY, Roy

Submitted on Thursday 29 July 2010

Last modified on : Thursday 29 July 2010

Comments :

Status : ACCEPTED

Track judgments :

Abstract ID : 83

Transport with unstable particles

Content :

The small value of the shear viscosity to entropy density ratio suggests a strongly interacting quark matter where the elementary excitations are far from being small-width quasiparticles. In this talk I suggest an approach how the transport coefficients can be calculated in systems with broad spectral functions. It will be shown that the transport coefficients are naturally small, and, in particular, the lower bound for η/s is recalculated in this approach.

Primary authors : Dr. JAKOVAC, Antal (BME Institute of Physics)

Co-authors :

Presenter : Dr. JAKOVAC, Antal (BME Institute of Physics)

Track classification : Hydro and Transport Models I.

Contribution type : --not specified--

Submitted by : Dr. JAKOVAC, Antal

Submitted on Wednesday 04 August 2010

Last modified on : Wednesday 04 August 2010

Comments :

Status : ACCEPTED

Track judgments :

Track : Hydro and Transport Models I.

Judgment :

Judged by :

Date :

Comments : ""

Abstract ID : 84

Spectra of weakly decaying identified particles at 0.9 and 7 TeV with the CMS detector

Content :

In this poster I will present the recent results of the CMS Experiment on the measurement of spectra of weakly decaying neutral particles, such as K0s, Lambda and AntiLambda, at 0.9 and 7 TeV. This covers the dN/deta and dN/dpT distributions and various Lambda/AntiLambda asymetry results. Spectra of Xi- (which decays into Lambda and Pion) will also be shown with the same details. Comparisons with various Monte Carlo models will be presented.

Primary authors : Mr. KRAJCZAR, Krisztian (ELTE)

Co-authors :

Presenter : Mr. KRAJCZAR, Krisztian (ELTE)

Track classification : Experiments and Theories

Contribution type : --not specified--

Submitted by : Mr. KRAJCZAR, Krisztian

Submitted on Thursday 05 August 2010

Last modified on : Thursday 05 August 2010

Comments :

Status : ACCEPTED

Track judgments :

Track : Experiments and Theories

Judgment :

Judged by :

Date :

Comments : ""

Abstract ID : 85

Underlying events in p+p collisions at LHC energies

Content :

Jet matter interaction remains a central question and a theoretical challenge in heavy-ion physics and might become important in high-multiplicity events in proton-proton collisions at LHC energies. Full jet measurements at LHC are hoped to reconstruct the complete energy loss process and fragmentation of the hard parton in the medium. Since, jet reconstruction will be constrained to small cone sizes, study of the connection between jets and their underlying event could provide a differential tool combined with particle identification in a wide momentum range.

We study p+p events at ALICE and analyse jet-like properties and the underlying event at the particle level using correlations and hadron PID information.

Primary authors : AGóCS, András (MTA KFKI RMKI)

Co-authors : BARNAFöLDI, Gergely (MTA KFKI RMKI) ; LÉVAI, Péter (MTA KFKI RMKI)

Presenter : AGóCS, András (MTA KFKI RMKI)

Track classification : Experiments and Theories

Contribution type : --not specified--

Submitted by : AGóCS, András

Submitted on Saturday 07 August 2010

Last modified on : Saturday 07 August 2010

Comments :

Status : ACCEPTED

Track judgments :

Track : Experiments and Theories

Judgment :

Judged by :

Date :

Comments : ""

Abstract ID : 86

The temperature of moving bodies - thermodynamics, hydrodynamics and kinetic theory

Content :

In the presentation the concept of temperature in relativistic thermodynamics is shortly surveyed and argued that the historical paradoxes are connected to the stability and causality issues of relativistic hydrodynamic theories. It is shown that a choice of "flow frames" (e.g. Eckart or Landau-Lifshitz), that is the definition of the velocity field, can partially hide the problematic aspects but eventually may lead to numerical instabilities.

Primary authors : Dr. Ván, Péter (MTA KFKI RMKI, Dep. of Theoretical Physics)

Co-authors :

Presenter : Dr. Ván, Péter (MTA KFKI RMKI, Dep. of Theoretical Physics)

Track classification : Hydro and Transport Models I.

Contribution type : --not specified--

Submitted by : NO SURNAME, No Name

Submitted on Monday 09 August 2010

Last modified on : Monday 09 August 2010

Comments :

Status : ACCEPTED

Track judgments :

Track : Hydro and Transport Models I.

Judgment :

Judged by :

Date :

Comments : ""