Abstracta

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[P189-2014] "A Search for Point Sources of Eev Photons"

Aab, A.; Abreu, P.; Aglietta, M.; **Chinellato, J. A.*; Daniel, B.*; Castro, M. L. Diaz*; Dobrigkeit, C.*; Escobar, C. O.*; Fauth, A. C.*; Kemp, E.*; Muller, M. A.*; Selmi-Dei, D. Pakk*;Theodoro, V. M.*; Silva, M. Zimbres***; et al.
Pierre Auger Collaborat

Measurements of air showers made using the hybrid technique developed with the fluorescence and surface detectors of the Pierre Auger Observatory allow a sensitive search for point sources of EeV photons anywhere in the exposed sky. A multivariate analysis reduces the background of hadronic cosmic rays. The search is sensitive to a declination band from -85 degrees to +20 degrees, in an energy range from 10(17.3) eV to 10(18.5) eV. No photon point source has been detected. An upper limit on the photon flux has been derived for every direction. The mean value of the energy flux limit that results from this, assuming a photon spectral index of -2, is 0.06 eV cm(-2) s(-1), and no celestial direction exceeds 0.25 eV cm(-2) s(-1). These upper limits constrain scenarios in which EeV cosmic ray protons are emitted by non-transient sources in the Galaxy.

[P190-2014] "A Targeted Search for Point Sources of Eev Neutrons"

Aab, A.; Abreu, P.; Aglietta, M.; **Chinellato, J. A.*; Daniel, B.*; Castro, M. L. Diaz*; Dobrigkeit, C.*; Escobar, C. O.*; Fauth, A. C.*; Kemp, E.*; Muller, M. A.*; Selmi-Dei, D. Pakk*;Theodoro, V. M.*; Silva, M. Zimbres***; et al.
Pierre Auger Collaboration

A flux of neutrons from an astrophysical source in the Galaxy can be detected in the Pierre Auger Observatory as an excess of cosmic-ray air showers arriving from the direction of the source. To avoid the statistical penalty for making many trials, classes of objects are tested in combinations as nine "target sets," in addition to the search for a neutron flux from the Galactic center or from the Galactic plane. Within a target set, each candidate source is weighted in proportion to its electromagnetic flux, its exposure to the Auger Observatory, and its flux attenuation factor due to neutron decay. These searches do not find evidence for a neutron flux from any class of candidate sources. Tabulated results give the combined p-value for each class, with and without the weights, and also the flux upper limit for the most significant candidate source within each class. These limits on fluxes of neutrons significantly constrain models of EeV proton emission from non-transient discrete sources in the Galaxy.

[P191-2014] "A very high momentum particle identification detector"

Acconcia, T. V.*; Agocs, A. G.; Barile, F.; **Dash, A. K.*; Takahashi, J.***; et al.

A new detector concept has been investigated to extend the capabilities of heavy-ion collider experiments, represented here through the ALICE detector, in the high transverse momentum (p (T) region. The resulting Very High Momentum Particle Identification Detector (VHMPID) performs charged hadron identification on a track-by-track basis in the 5 GeV/c < p < 25 GeV/c momentum range and provides heavy-ion experiments with new opportunities to study parton-medium interactions at RHIC and LHC energies, where the creation of deconfined quark-gluon matter has been established. The detector is based on novel advances to the pressurized gaseous ring imaging Cherenkov (RICH) concept, which yield a very compact, high resolution addition to existing heavy-ion experiments. We conclude that in order for the device to yield statistically significant results not only for single particle measurements, but also for di-hadron and jet-tagged correlation studies, it has to cover contiguously up to 30% of a central barrel detector in radial direction. This will allow, for the first time, identified charged hadron measurements in jets. In this paper we summarize the physics motivations for such a device, as well as its conceptual design, layout, and integration into ALICE.

[P192-2014] "Absorption effects on plasmon polariton-gap solitons in Kerr/metamaterial superlattices"

Reyes-Gomez, E.; Cavalcanti, S. B.; **Oliveira, L. E.***

A thorough study of the absorption effects on the plasmon polariton-gap soliton-induced transparency in 1D Kerr/metamaterial superlattices is presented. Results indicate that for frequencies close to the bottom or top edge of the bulk-like longitudinal plasmon-polariton gap, the transmission of a finite Kerr/metamaterial superlattice presents a multistable behavior, switching from very low values to the maximum transparency at particular values of the incident power even in the presence of loss effects. Moreover, calculations suggest the existence of resonant plasmon polariton-gap solitons of various orders depending on the particular value of the incident power. The present results reveal that plasmon polariton-gap soliton-induced resonant solutions lead to the transparency of a stack with nonlinear inclusions, a nonlinear optical analog of the electronic barrier-transmission resonances.

[P193-2014] "Adsorption of Pd, Pt, Cu, Ag, and Au Monomers on NiAl(110) Surface: A Comparative Study from DFT Calculations"

San-Miguel, Miguel A.; Amorim, E. P. M.; **da Silva, E. Z.***

First principles calculations based on periodic density functional theory (DFT) have been used to investigate the structural, energetic and electronic properties of different transition metal atoms (Pd, Pt, Cu, Ag, and Au) on the NiAl(110) surface at low coverages (0.08 and 0.25 monolayer). All adatoms prefer to adsorb on 4-fold coordinated sites interacting with two Al and two Ni atoms and forming polar and covalent bonds, respectively. The calculated negative work function changes are explained by the effect of positive surface image created after adsorption, which induces the polarization of the negatively charged adsorbates. Consequently, for metals with similar electronegativity as Ni (Ag and Cu), this polarization effect becomes more significant and leads to larger negative work function changes, but the charge transferred is small.

[P194-2014] "Alternative Prey and Abundance Covariance Switches an Intraguild Predator's Functional Response"

Faria, L. D.; Tuller, J.; Maia, L. F.; **Reigada, C.***; Godoy, W. A. C.

Positive or negative prey abundance covariances play an important role in determining prey preference of predators. The goal here was to understand how variations in abundance of two blowfly prey species, a native and a non-native species, influence the switching behavior and functional response of Chrysomya albiceps, an intraguild predatory blowfly, under laboratory conditions. The results suggest C. albiceps prefers to consume a native prey species rather than a non--native prey species. However, when prey densities covariate negatively, both species were consumed at the same rate, changing predator's functional response from type II to type III. The conditions that trigger the switching behavior in blowfly communities are discussed in detail in this study.

[P195-2014] "Amorphous Al2O3 Shield for Thermal Management in Electrically Pumped Metallo-Dielectric Nanolasers"

Gu, Q.; Shane, J.; **Vallini, F.***; Wingad, B.; Smalley, J. S. T.; **Frateschi, N. C.***; Fainman, Y.

We analyze amorphous Al2O3 (alpha-Al2O3) for use as a thick thermally conductive shield in metallo-dielectric semiconductor nanolasers, and show that the use of alpha-Al2O3 allows a laser to efficiently dissipate heat through its shield. This new mechanism for thermal management leads to a significantly lower operating temperature within the laser, compared with lasers with less thermally conductive shields, such as SiO2. We implement the shield in a continuous wave electrically pumped cavity, and analyze its experimental performance by jointly investigating its optical, electrical, thermal, and material gain properties. Our analysis shows that the primary obstacle to room temperature lasing was the device's high threshold gain. At the high pump levels required to achieve the gain threshold, particularly at room temperature, the gain spectrum broadened and shifted, leading to detrimental mode competition. Further simulations predict that an increase in the pedestal undercut depth should enable room temperature lasing in a device with the same footprint and gain volume. Through the integrated treatment of various physical effects, this analysis shows the promise of alpha-Al2O3 for nanolaser thermal management, and enables better understanding of nanolaser behavior, as well as more informed design of reliable nanolasers.

[P196-2014] "Background-independent measurement of theta(13) in Double Chooz"

Abe, Y.; dos Anjos, J. C.; Barriere, J. C.; **Gonzalez, L. F. G.***; **Kemp, E.***; et al.

The oscillation results published by the Double Chooz Collaboration in 2011 and 2012 rely on background models substantiated by reactor-on data. In this analysis, we present a background--model-independent measurement of the mixing angle theta(13) by including 7.53 days of reactor-off data. A global fit of the observed antineutrino rates for different reactor power conditions is performed, yielding a measurement of both theta(13) and the total background rate. The results on the mixing angle are improved significantly by including the reactor-off data in the fit, as it provides a direct measurement of the total background rate. This reactor rate modulation analysis considers antineutrino candidates with neutron captures on both Gd and H, whose combination yields $\sin(2)(2\ theta(13)) = 0.102 \pm 0.028(stat.) \pm 0.033(syst.)$. The results presented in this study are fully consistent with the ones already published by Double Chooz, achieving a competitive precision. They provide, for the first time, a determination of theta(13) that does not depend on a background model.

[P197-2014] "Beam-Energy Dependence of Charge Separation along the Magnetic Field in Au plus Au Collisions at RHIC"

Adamczyk, L.; Adkins, J. K.; Agakishiev, G.; **Derradi De Souza, R.***; **Takahashi, J.***; **Vasconcelos, G. M. S.***; et al.
STAR Collaboration

Local parity-odd domains are theorized to form inside a quark--gluon plasma which has been produced in high-energy heavy--ion collisions. The local parity-odd domains manifest themselves as charge separation along the magnetic field axis via the chiral magnetic effect. The experimental observation of charge separation has previously been reported for heavy-ion collisions at the top RHIC energies. In this Letter, we present the results of the beam-energy dependence of the charge correlations in Au + Au collisions at midrapidity for center-of--mass energies of 7.7, 11.5, 19.6, 27, 39, and 62.4 GeV from the STAR experiment. After background subtraction, the signal gradually reduces with decreased beam energy and tends to vanish by 7.7 GeV. This implies the dominance of hadronic interactions over partonic ones at lower collision energies.

[P198-2014] "Beam-Energy Dependence of the Directed Flow of Protons, Antiprotons, and Pions in Au plus Au Collisions"

Adamczyk, L.; Adkins, J. K.; Agakishiev, G.; **Derradi de Souza, R.***; **Takahashi, J.***; **Vasconcelos, G. M. S.***; et al.
STAR Collaboration

Rapidity-odd directed flow (upsilon 1) measurements for charged pions, protons, and antiprotons near midrapidity (y = 0) are reported in root(S)(NN) = 7.7, 11.5, 19.6, 27, 39, 62.4, and 200 GeVAu+Au collisions as recorded by the STAR detector at the Relativistic Heavy Ion Collider. At intermediate impact parameters, the proton and net-proton slope parameter d upsilon(1) = d upsilon(1)vertical bar (y=0) shows a minimum between 11.5 and 19.6 GeV. In addition, the net-proton d upsilon(1) = d upsilon(1)vertical bar (y=0) changes sign twice between 7.7 and 39 GeV. The proton and net-proton results qualitatively resemble predictions of a hydrodynamic model with a first-order phase transition from hadronic matter to deconfined matter, and differ from hadronic transport calculations.

[P199-2014] "Centrality, rapidity and transverse momentum dependence of J/Psi suppression in Pb-Pb collisions at root(NN)-N-S=2.76TeV"

Abelev, B.; Adam, J.; Adamova, D.; **Chinellatodo, D. D.***; **Dash, A.***; **Takahashi, J.***; et al.
ALICE Collaboration

The inclusive J/.nuclear modification factor (R-AA) in Pb--Pb collisions at root(NN)-N-S = 2.76TeVhas been measured by ALICE as a function of centrality in the e+e-decay channel at mid-rapidity (| y| < 0.8) and as a function of centrality, transverse momentum and rapidity in the + -decay channel at forward-rapidity (2.5 < y < 4). The J/.yields measured in Pb-Pb are suppressed compared to those in ppcollisions scaled by the number of binary collisions.

The RAAintegrated over a centrality range corresponding to 90% of the inelastic Pb-Pb cross section is 0.72 - 0.06(stat.) - 0.10(syst.) at mid-rapidity and 0.58 - 0.01(stat.) - 0.09(syst.) at forward-rapidity. At low transverse momentum, significantly larger values of RAAare measured at forward-rapidity compared to measurements at lower energy. These features suggest that a contribution to the J/.yield originates from charm quark (re) combination in the deconfined partonic medium.

[P200-2014] "Circular geodesics of naked singularities in the Kehagias-Sfetsos metric of Horava's gravity"

Vieira, R. S. S.*; Schee, J.; Kluzniak, W.; Stuchlik, Z.; Abramowicz, M.

We discuss photon and test-particle orbits in the Kehagias-Sfetsos (KS) metric of Horava's gravity. For any value of the Horava parameter., there are values of the gravitational mass M for which the metric describes a naked singularity, and this is always accompanied by a vacuum "antigravity sphere" on whose surface a test particle can remain at rest (in a zero angular momentum geodesic), and inside which no circular geodesics exist. The observational appearance of an accreting KS naked singularity in a binary system would be that of a quasistatic spherical fluid shell surrounded by an accretion disk, whose properties depend on the value of M, but are always very different from accretion disks familiar from the Kerr-metric solutions. The properties of the corresponding circular orbits are qualitatively similar to those of the Reissner-Nordstrom naked singularities. When event horizons are present, the orbits outside the Kehagias-Sfetsos black hole are qualitatively similar to those of the Schwarzschild metric.

[P201-2014] "Coherence properties of coupled optomechanical cavities"

Roque, T. F.*; Vidiella-Barranco, A.*

In this work we investigate an optomechanical system consisting of two cavities coupled to the same mechanical resonator. We consider each cavity being weakly pumped as well as a small tunneling rate between the cavities. In such conditions, the system can be studied via quantum Langevin equations and the steady-state solution can be found perturbatively. In order to ensure that the approximations and methods used to study the system are suitable, the analytical results were compared to numerical results. We study the statistical properties of the cavity radiation fields and we show that depending on the values of the parameters of the system, it is possible to modify the spectrum of the cavities and enhance significantly the sub-Poissonian character of the cavity field.

[P202-2014] "Constraining the violation of the equivalence principle with IceCube atmospheric neutrino data"

Esmaili, A.*; Gratieri, D. R.*; Guzzo, M. M.*; de Holanda, P. C.*; Peres, O. L. G.*; Valdiviesso, G. A.

The recent high-statistics high-energy atmospheric neutrino data collected by IceCube open a new window to probe new physics scenarios that are suppressed in lower-energy neutrino experiments.

In this paper we analyze the IceCube atmospheric neutrino data to constrain the violation of equivalence principle (VEP) in the framework of three neutrinos with nonuniversal gravitational couplings. In this scenario the effect of the VEP on neutrino oscillation probabilities can be parametrized by two parameters, Delta gamma(21) equivalent to gamma(2) - gamma(1) and Delta gamma(31) equivalent to gamma(3) - gamma(1), where gamma(i)'s denote the coupling of neutrino mass eigenstates to the gravitational field. By analyzing the latest muon-tracks data sets of IceCube-40 and IceCube-79, besides providing the two-dimensional allowed regions in the (phi Delta gamma(21), phi Delta gamma(31)) plane, we obtain the upper limits vertical bar phi Delta gamma(21)vertical bar < 9.1 x 10(-27) (at 90% C.L.), which improves the previous limit by similar to 4 orders of magnitude, and vertical bar phi Delta gamma(31)vertical bar less than or similar to 6 x 10(-27) (at 90% C.L.), which improves the current limit by similar to 1 order of magnitude. Also we discuss in detail and analytically the effect of the VEP on neutrino oscillation probabilities.

[P203-2014] "Continuous Optical Monitoring of Cerebral Hemodynamics During Head-of-Bed Manipulation in Brain-Injured Adults"

Kim, M. N.; Edlow, B. L.) Durduran, T.; Frangos, S.; **Mesquita, R. C.*;** Levine, J. M.; Greenberg, J. H.; Yodh, A. G.; Detre, J. A.

Head-of-bed manipulation is commonly performed in the neurocritical care unit to optimize cerebral blood flow (CBF), but its effects on CBF are rarely measured. This pilot study employs a novel, non-invasive instrument combining two techniques, diffuse correlation spectroscopy (DCS) for measurement of CBF and near-infrared spectroscopy (NIRS) for measurement of cerebral oxy- and deoxy-hemoglobin concentrations, to monitor patients during head-of-bed lowering. Ten brain-injured patients and ten control subjects were monitored continuously with DCS and NIRS while the head-of-bed was positioned first at 30A degrees and then at 0A degrees. Relative CBF (rCBF) and concurrent changes in oxy- (Delta HbO(2)), deoxy- (Delta Hb), and total-hemoglobin concentrations (Delta THC) from left/right frontal cortices were monitored for 5 min at each position. Patient and control response differences were assessed. rCBF, Delta HbO(2), and Delta THC responses to head lowering differed significantly between brain-injured patients and healthy controls (P < 0.02). For patients, rCBF changes were heterogeneous, with no net change observed in the group average (0.3 +/- A 28.2 %, P = 0.938). rCBF increased in controls (18.6 +/- A 9.4 %, P < 0.001). Delta HbO(2), Delta Hb, and Delta THC increased with head lowering in both groups, but to a larger degree in brain-injured patients. rCBF correlated moderately with changes in cerebral perfusion pressure (R = 0.40, P < 0.001), but not intracranial pressure. DCS/NIRS detected differences in CBF and oxygenation responses of brain-injured patients versus controls during head-of-bed manipulation. This pilot study supports the feasibility of continuous bedside measurement of cerebrovascular hemodynamics with DCS/NIRS and provides the rationale for further investigation in larger cohorts.

[P204-2014] "Cross sections for electron scattering by methylfluoride (CH3F) in the low- and intermediate-energy ranges"

Ferraz, J. R.; dos Santos, A. S.; de Souza, G. L. C.; Lee, M. T.; **Brescansin, L. M.*;** Lucchese, R. R.; Machado, L. E.

We report a theoretical study on electron scattering by methylfluoride (CH3F) in the intermediate-energy range.

Calculated elastic differential, integral, and momentum--transfer, as well as grand-total (elastic + inelastic) and total absorption cross sections are reported for impact energies ranging from 15 to 500 eV. A complex optical potential is used to represent the electron-molecule interaction dynamics. A theoretical method based on die single-center-expansion close-coupling framework and corrected by the Pade approximant technique is used to solve the scattering equations. The comparison of our calculated results with experimental and other available theoretical data is encouraging.

[P205-2014] "Crystal growth of Si2TeO5 by a double crucible Czochralski method"

Carvalho, J. F.; Fabris, Z. V.; de Oliveira, I.; **Frejlich, J.***

Single crystals of bismuth tellurite (Bi2TeO5) were grown by a double crucible Czochralski method at different pulling and rotation rates, ranging from 0.1 mm/h to 0.8 mmill and from 5 rpm to 20 rpm, respectively. The crystallized phase was verified by X-ray diffraction measurements, occurring structural defects were characterized, and the growth conditions were studied being determined the better parameters to growth good-quality single crystals with uniform pale yellow coloration. Optical band gap of 3.1 eV was determined from the optical transmission spectrum.

[P206-2014] "Cs2NaAl1-xCrxF6: A family of compounds presenting magnetocaloric effect"

Pedro, S. S.; Tedesco, J. C. G.; Yokaichiya, F.; Brandao, P.; Gomes, A. M.; Landsgesell, S.; Pires, M. J. M.; Sosman, L. P.; **Mansanares, A. M.***; Reis, M. S.; Bordallo, H. N.

In this paper we explore the magnetocaloric effect (MCE) of chromium-doped elpasolite Cs2NaAl1-x,CrxF6 (x = 0.01 and 0.62) single crystals. Magnetization and heat capacity data show the magnetocaloric potentials to be comparable to those of garnets, perovskites, and other fluorides, producing magnetic entropy changes of 0.5 J/kg K (x = 0.01) and 11 J/kg K (x = 0.62), and corresponding adiabatic temperature changes of 4 and 8 K, respectively. These values are for a magnetic field change of 50 kOe at a temperature around 3 K. A clear Schottky anomaly below 10 K, which becomes more apparent when an external magnetic field is applied, was observed and related to the splitting of the Cr3+ energy levels. These results hint at a new family of materials with potential wide use in cryorefrigeration.

[P207-2014] "Dielectron Mass Spectra from Au plus Au Collisions at root s(NN)=200 Ge V"

Adamczyk, L.; Adkins, J. K.; Agakishiev, G.; **Derradi de Souza, R.***; **Takahashi, J.***; **Vasconcelos, G. M. S.***; et al.
STAR Collaboration

We report the STAR measurements of dielectron (e(+) e(-)) production at midrapidity (vertical bar y(ee)vertical bar < 1) in Au + Au collisions at root s(NN) = 200 GeV. The measurements are evaluated in different invariant mass regions with a focus on 0.30-0.76 (rho-like), 0.76-0.80 (omega-like), and 0.98-1.05 (phi-like) GeV/c(2).

The spectrum in the omega-like and phi-like regions can be well described by the hadronic cocktail simulation. In the rho-like region, however, the vacuum rho spectral function cannot describe the shape of the dielectron excess. In this range, an enhancement of 1.77 +/- 0.11(stat) +/- 0.24(syst) +/- 0.33(cocktail) is determined with respect to the hadronic cocktail simulation that excludes the rho meson. The excess yield in the rho-like region increases with the number of collision participants faster than the omega and phi yields. Theoretical models with broadened rho contributions through interactions with constituents in the hot QCD medium provide a consistent description of the dilepton mass spectra for the measurement presented here and the earlier data at the Super Proton Synchrotron energies.

[P208-2014] "Dynamics of a superconducting qubit coupled to the quantized cavity field: a unitary transformation approach"

Freitas, D. S.; **Vidiella-Barranco, A.***; **Roversi, J. A.***

We present a novel approach for studying the dynamics of a superconducting qubit in a cavity. We succeed in linearizing the Hamiltonian through the application of an appropriate unitary transformation followed by a rotating wave approximation (RWA). For certain values of the parameters involved, we show that it is possible to obtain a Jaynes-Cummings type Hamiltonian. As an example, we show the existence of super-revivals for the qubit inversion.

[P209-2014] "Electrochemical Detection of Nitrite in Meat and Water Samples Using a Mesoporous Carbon Ceramic SiO2/C Electrode Modified with In Situ Generated Manganese(II) Phthalocyanine"

Rahim, A.; Santos, L. S. S.; Barros, S. B. A.; Kubota, L. T.; **Landers, R.***; Gushikem, Y.

Mesoporous carbon ceramic SiO2/50wt% C (S-BET=170m(2)g(-1)), where C is graphite, were prepared by the sol-gel method. The materials were characterized using N-2 sorption isotherms, scanning electron microscopy, and conductivity measurements. The matrix was used as support for the in situ immobilization of Mn(II) phthalocyanine (MnPc) on their surface. XPS was used to determine the Mn/Si atomic ratios of the MnPc-modified materials. Pressed disk electrodes were prepared with the MnPc-modified matrix, and tested as an electrochemical sensor for nitrite oxidation. The linear response range, sensitivity, detection limit and quantification limit were 0.79-15.74 mu molL(-1), 17.31 mu AL mu mol(-1), 0.02 mu molL(-1) and 0.79 mu molL(-1), respectively, obtained using cyclic voltammetry. The repeatability of the proposed sensor, evaluated in terms of relative standard deviation was 1.7% for 10 measurements of a solution of 12.63 mu molL(-1) nitrite. The sensor employed to determine nitrite in sausage meat, river and lake water samples showed to be a promising tool for this purpose.

[P210-2014] "Electronic and structural study of Pt-modified Au vicinal surfaces: a model system for Pt-Au catalysts"

Prieto, M. J.*; **Carbonio, E. A.***; **Fatayer, S.***; **Landers, R.***; **de Siervo, A.***

Two single crystalline surfaces of Au vicinal to the (111) plane were modified with Pt and studied using scanning tunneling microscopy (STM) and X-ray photoemission spectroscopy (XPS) in ultra-high vacuum environment. The vicinal surfaces studied are Au(332) and Au(887) and different Pt coverage (yPt) were deposited on each surface. From STM images we determine that Pt deposits on both surfaces as nanoislands with heights ranging from 1 ML to 3 ML depending on yPt. On both surfaces the early growth of Pt ad-islands occurs at the lower part of the step edge, with Pt ad-atoms being incorporated into the steps in some cases. XPS results indicate that partial alloying of Pt occurs at the interface at room temperature and at all coverage, as suggested by the negative chemical shift of Pt 4f core line, indicating an upward shift of the d-band center of the alloyed Pt. Also, the existence of a segregated Pt phase especially at higher coverage is detected by XPS. Sample annealing indicates that the temperature rise promotes a further incorporation of Pt atoms into the Au substrate as supported by STM and XPS results. Additionally, the catalytic activity of different PtAu systems reported in the literature for some electrochemical reactions is discussed considering our findings.

[P211-2014] "Emergent Antiferromagnetism out of the "Hidden-Order" State in URu2Si2: High Magnetic Field Nuclear Magnetic Resonance to 40 T"

Sakai, H.; Tokunaga, Y.; Kambe, S.; **Urbano, R. R.*;** Suzuki, M. T.; Kuhns, P. L.; Reyes, A. P.; Tobash, P. H.; Ronning, F.; Bauer, E. D.; Thompson, J. D.

Very high field Si-29-NMR measurements using a fully Si-29--enriched URu2Si2 single crystal were carried out in order to microscopically investigate the "hidden order" (HO) state and adjacent magnetic phases in the high field limit. At the lowest measured temperature of 0.4 K, a clear anomaly reflecting a Fermi surface instability near 22 T inside the HO state is detected by the Si-29 shift, K-29(c) Moreover, a strong enhancement of K-29(c) develops near a critical field H-c similar or equal to 35.6 T, and the Si-29-NMR signal disappears suddenly at H-c, indicating the total suppression of the HO state. Nevertheless, a weak and shifted Si-29-NMR signal reappears for fields higher than H-c at 4.2 K, providing evidence for a magnetic structure within the magnetic phase caused by the Ising-type anisotropy of the uranium ordered moments.

[P212-2014] "Evidence for the 125 GeV Higgs boson decaying to a pair of tau leptons"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli*;** et al.
CMS Collaboration

A search for a standard model Higgs boson decaying into a pair of tau leptons is performed using events recorded by the CMS experiment at the LHC in 2011 and 2012. The dataset corresponds to an integrated luminosity of 4.9 fb(-1) at a centre--of-mass energy of 7 TeV and 19.7 fb(-1) at 8 TeV. Each tau lepton decays hadronically or leptonically to an electron or a muon, leading to six different final states for the tau-lepton pair, all considered in this analysis. An excess of events is observed over the expected background contributions, with a local significance larger than 3 standard deviations for m (H) values between 115 and 130 GeV. The best fit of the observed H -> tau tau signal cross section times branching fraction for m(H) = 125 GeV is 0.78 +/- 0.27 times the standard model expectation. These observations constitute evidence for the 125 GeV Higgs boson decaying to a pair of tau leptons.

[P213-2014] "Exploring the effects of dimensionality on the magnetic properties of intermetallic nanowires"

Rosa, P. F. S.*; de Oliveira, L. A. S.*; de Jesus, C. B. R.*; Moura, K. O.*; Adriano, C.*; Iwamoto, W.*; Garitezi, T. M.*; Granado, E.*; Saleta, M. E.*; Pirota, K. R.*; Pagliuso, P. G.*

Correlated electron intermetallic bulk systems exhibit exciting phenomena, such as unconventional superconductivity, heavy fermion behavior, magnetic ordering, and quantum criticality. However, such exciting properties in related systems with reduced dimensionality are rather unexplored and unpredictable. In this work, we explore the routes for synthesizing nanowires of the intermetallic antiferromagnet compound GdIn3 by an innovative method: the metallic-flux nanonucleation (MFNN). This technique allows the simultaneous synthesis of bulk GdIn3 single crystals (T-N(3D) = 45 K) and their low-dimensional (LD) analogs, which nucleate with diameter d approximate to 200 nm and length l approximate to 30 mu m inside pores of an Al2O3 template. Both systems were studied by means of Energy Dispersive Spectroscopy (EDS), magnetic susceptibility, heat capacity and electron spin resonance (ESR) measurements. Interestingly, the metallic nanowires show a drastic suppression of the antiferromagnetic ordering to T-N(LD) = 4 K. These observations suggest the presence of LD magnetic frustration in this compound and possibly open a new route to explore the role of low-dimensionality in strongly correlated materials.

[P214-2014] "Influence of ion-beam bombardment on the physical properties of 100Cr6 steel"

Droppa, R.; Pinto, H. C.; Garcia, J.; Ochoa, E. A.; **Morales, M.*; Cucatti, S.*; Alvarez, F.***

The effect of ion-beam bombardment with low energy Xe ions on the physical properties of 100Cr6 steel is reported. The modified region induced by the relative low energy ions (<1 key) extends orders of magnitude deeper than the stopping length of the impacting ions. The energy dependence of the indepth stress and the pattern formation is also verified. The formation of peculiar patterns on the treated surface is discussed by evoking the current model of surface instability produced by preferential sputtering and surface diffusion in metals.

[P215-2014] "Longitudinal analysis of hippocampal T2 relaxometry in FMTLE"

Suemitsu, L. A. Y.; Yasuda, C. L.; Morita, M. E.; **Beltramini, G. C.*;** Coan, A. C.; Bergo, F.; Lopes-Cendes, I.; Cendes, F.

Purpose: To investigate the degree of T2 relaxometry changes over time in groups of patients with familial mesial temporal lobe epilepsy (FMTLE) and asymptomatic relatives. Methods: We conducted both cross-sectional and longitudinal analyses of T2 relaxometry with Aftervoxel, an inhouse software for medical image visualization. The cross-sectional study included 35 subjects (26 with FMTLE and 9 asymptomatic relatives) and 40 controls; the longitudinal study was composed of 30 subjects (21 with FMTLE and 9 asymptomatic relatives; the mean time interval of MRIs was 4.4 +/- 1.5 years) and 16 controls. To increase the size of our groups of patients and relatives, we combined data acquired in 2 scanners (2T and 3T)

and obtained z-scores using their respective controls. General linear model on SPSS21 (R) was used for statistical analysis. Results: In the cross-sectional analysis, elevated T2 relaxometry was identified for subjects with seizures and intermediate values for asymptomatic relatives compared to controls. Subjects with MRI signs of hippocampal sclerosis presented elevated T2 relaxometry in the ipsilateral hippocampus, while patients and asymptomatic relatives with normal MRI presented elevated T2 values in the right hippocampus. The longitudinal analysis revealed a significant increase in T2 relaxometry for the ipsilateral hippocampus exclusively in patients with seizures. Conclusions: The longitudinal increase of T2 signal in patients with seizures suggests the existence of an interaction between ongoing seizures and the underlying pathology, causing progressive damage to the hippocampus. The identification of elevated T2 relaxometry in asymptomatic relatives and in patients with normal MRI suggests that genetic factors may be involved in the development of some mild hippocampal abnormalities in FMTLE.

[P216-2014] "Measurement of associated W plus charm production in pp collisions at root s=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

Measurements are presented of the associated production of a W boson and a charm-quark jet (W + c) in pp collisions at a center-of-mass energy of 7 TeV. The analysis is conducted with a data sample corresponding to a total integrated luminosity of 5 fb(-1), collected by the CMS detector at the LHC. W boson candidates are identified by their decay into a charged lepton (muon or electron) and a neutrino. The W + c measurements are performed for charm-quark jets in the kinematic region p(T)(jet) > 25 GeV, vertical bar eta(jet)vertical bar < 2.5, for two different thresholds for the transverse momentum of the lepton from the W-boson decay, and in the pseudorapidity range eta(l) < 2.1. Hadronic and inclusive semileptonic decays of charm hadrons are used to measure the following total cross sections: sigma(pp -> W + c + X) x B (W -> lv) = 107.7 +/- 3.3 (stat.) +/- 6.9 (syst.) pb (p(T)(l) > 25 GeV) and sigma (pp -> W + c + X) x B (W -> lv) = 84.1 +/- 2.0 (stat.) +/- 4.9 (syst.) pb (p(T)(l) > 35 GeV), and the cross section ratios sigma(pp -> W+ + (c) over bar + X)/sigma(pp -> W- + c + X) = 0.954 +/- 0.025 (stat.) +/- 0.004 (syst.) (p(T)(l) > 25 GeV) and sigma(pp -> W+ + (c) over bar + X)/sigma(pp -> W- + c + X) = 0.938 +/- 0.019 (stat.) +/- 0.006 (syst.) (p(T)(l) > 35 GeV). Cross sections and cross section ratios are also measured differentially with respect to the absolute value of the pseudorapidity of the lepton from the W-boson decay. These are the first measurements from the LHC directly sensitive to the strange quark and antiquark content of the proton. Results are compared with theoretical predictions and are consistent with the predictions based on global fits of parton distribution functions.

[P217-2014] "Measurement of four-jet production in proton-proton collisions at root s=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

Measurements of the differential cross sections for the production of exactly four jets in proton-proton collisions are presented as a function of the transverse momentum p(T) and pseudorapidity eta, together with the correlations in azimuthal angle and the p(T) balance among the jets. The data sample was collected in 2010 at a center-of-mass energy of 7 TeV with the CMS detector at the LHC, with an integrated luminosity of 36 pb(-1). The cross section for exactly four jets, with two hard jets of p(T) > 50 GeV each, together with two jets of p(T) > 20 GeV each, within vertical bar eta vertical bar < 4.7 is measured to be sigma = 330 +/- 5(stat.) +/- 45(syst.) nb. It is found that fixed-order matrix element calculations including parton showers describe the measured differential cross sections in some regions of phase space only, and that adding contributions from double parton scattering brings the Monte Carlo predictions closer to the data.

[P218-2014] "Measurement of the production cross section for a W boson and two b jets in pp collisions at root s=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Tonelli Manganote, E. J.*;** et al.
CMS Collaboration

The production cross section for a Wboson and two b jets is measured using proton-proton collisions at v root s = 7 TeV in a data sample collected with the CMS experiment at the LHC corresponding to an integrated luminosity of 5.0 fb(-1). The W + bbevents are selected in the W..decay mode by requiring a muon with transverse momentum pT> 25GeVand pseudorapidity |eta| < 2.1, and exactly two b-tagged jets with pT> 25GeVand |eta| < 2.4. The measured W + bbproduction cross section in the fiducial region, calculated at the level of final-state particles, is s(pp.. W + bb) xB(W..) = 0.53 +/- 0.05 (stat.) +/- 0.09 (syst.) +/- 0.06 (theo.) 0.01 (lum.) pb, in agreement with the standard model prediction. In addition, kinematic distributions of the W + bbsystem are in agreement with the predictions of a simulation usingMadGraphandpythia.

[P219-2014] "Measurement of the production cross sections for a Z boson and one or more b jets in pp collisions at root s=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

The production of a Z boson, decaying into two leptons and produced in association with one or more b jets, is studied using proton-proton collisions delivered by the LHC at a centre-of-mass energy of 7 TeV. The data were recorded in 2011 with the CMS detector and correspond to an integrated luminosity of 5 fb(-1). The Z(ll) + b-jets cross sections (where ll = mu mu or ee) are measured separately for a Z boson produced with exactly one b jet and with at least two b jets. In addition, a cross section ratio is extracted for a Z boson produced with at least one b jet, relative to a Z boson produced with at least one jet. The measured cross sections are compared to various theoretical predictions, and the data favour the predictions in the five-flavour scheme, where b quarks are assumed massless. The kinematic properties of the reconstructed particles are compared with the predictions from the MadGraph event generator using the pythia parton shower simulation.

[P220-2014] "Measurement of the properties of a Higgs boson in the four-lepton final state"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; **Manganote, E. J. Tonelli***; et al.
CMS Collaboration

The properties of a Higgs boson candidate are measured in the H -> ZZ -> 4l decay channel, with l = e, mu, using data from pp collisions corresponding to an integrated luminosity of 5.1 fb(-1) at the center-of-mass energy of root s = 7 TeV and 19.7 fb(-1) at ffiffiffi root s = 8 TeV, recorded with the CMS detector at the LHC. The new boson is observed as a narrow resonance with a local significance of 6.8 standard deviations, a measured mass of 125.6 +/- 0.4(stat) +/- 0.2(syst) GeV, and a total width <= 3.4 GeV at the 95% confidence level. The production cross section of the new boson times its branching fraction to four leptons is measured to be 0.93(-0.23)(+0.26) (stat)(-0.09)(+0.13) (syst) times that predicted by the standard model. Its spin-parity properties are found to be consistent with the expectations for the standard-model Higgs boson. The hypotheses of a pseudoscalar and all tested spin-1 boson hypotheses are excluded at the 99% confidence level or higher. All tested spin-2 boson hypotheses are excluded at the 95% confidence level or higher.

[P221-2014] "Measurement of the t-channel single-top-quark production cross section and of the |V (tb)| CKM matrix element in pp collisions at root s=8 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; **Manganote, E. J. Tonelli***; et al.
CMS Collaboration

Measurements are presented of the t-channel single-top-quark production cross section in proton-proton collisions at root s = 8 TeV. The results are based on a data sample corresponding to an integrated luminosity of 19.7 fb(-1) recorded with the CMS detector at the LHC. The cross section is measured inclusively, as well as separately for top (t) and antitop (t) over bar, in final states with a muon or an electron. The measured inclusive t-channel cross section is sigma(t-ch.) = 83.6 +/- 2.3 (stat.) +/- 7.4 (syst.) pb. The single t and (t) cross sections are measured to be sigma(t-ch.)(t) = 53.8 +/- 1.5 (stat.) +/- 4.4 (syst.) pb and sigma(t-ch.)(t) over bar = 27.6 +/- 1.3 (stat.) +/- 3.7 (syst.) pb, respectively. The measured ratio of cross sections is Rt-ch. = sigma(t-ch.)(t)/sigma(t-ch.)(t) over bar = 1.95 +/- 0.10 (stat.) +/- 0.19 (syst.), in agreement with the standard model prediction. The modulus of the Cabibbo-Kobayashi-Maskawa matrix element V-tb is extracted and, in combination with a previous CMS result at root s = 7 TeV, a value vertical bar V-tb vertical bar = 0.998 +/- 0.038 (exp.) +/- 0.016 (theo.) is obtained.

[P222-2014] "Measurement of the triple-differential cross section for photon plus jets production in proton-proton collisions at=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; **Manganote, E. J. Tonelli***; **Bluj, M.***; et al.
CMS Collaboration

A measurement of the triple-differential cross section, in photon + jets final states using a data sample from proton-proton collisions at = 7 TeV is presented. This sample corresponds to an integrated luminosity of 2.14 fb(-1) collected by the CMS detector at the LHC. Photons and jets are reconstructed within a pseudorapidity range of |eta| < 2.5, and are required to have transverse momenta in the range 40 < < 300 GeV and > 30 GeV, respectively. The measurements are compared to theoretical predictions from the sherpa leading-order QCD

Monte Carlo event generator and the next-to-leading-order perturbative QCD calculation from jetphox. The predictions are found to be consistent with the data over most of the examined kinematic region.

[P223-2014] "Measurements of t(t)over-bar Spin Correlations and Top-Quark Polarization Using Dilepton Final States in pp Collisions at root s=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; **Manganote, E. J. Tonelli***; et al.
CMS Collaboration

Spin correlations and polarization in the top quark-antiquark system are measured using dilepton final states produced in pp collisions at the LHC at root s = 7 TeV. The data correspond to an integrated luminosity of 5.0 fb(-1) collected with the CMS detector. The measurements are performed using events with two oppositely charged leptons (electrons or muons), a significant imbalance in transverse momentum, and two or more jets, where at least one of the jets is identified as originating from a b quark. The spin correlations and polarization are measured through asymmetries in angular distributions of the two selected leptons, unfolded to the parton level. All measurements are found to be in agreement with predictions of the standard model.

[P224-2014] "Muons in air showers at the Pierre Auger Observatory: Measurement of atmospheric production depth"

Aab, A.; Abreu, P.; Aglietta, M.; **Chinellato, J. A.***; **Daniel, B.***; **Diaz Castro, M. L.***; **Dobrigkeit, C.***; **Escobar, C. O.***; **Fauth, A. C.***; **Kemp, E.***; **Muller, M. A.***; **Selmi-Dei, D. Pakk***; **Theodoro, V. M.***; **Silva, M. Zimbres***; et al.
Pierre Auger Collaboration

The surface detector array of the Pierre Auger Observatory provides information about the longitudinal development of the muonic component of extensive air showers. Using the timing information from the flash analog-to-digital converter traces of surface detectors far from the shower core, it is possible to reconstruct a muon production depth distribution. We characterize the goodness of this reconstruction for zenith angles around 60 degrees and different energies of the primary particle. From these distributions, we define X-max(mu) as the depth along the shower axis where the production of muons reaches maximum. We explore the potentiality of X-max(mu) as a useful observable to infer the mass composition of ultrahigh-energy cosmic rays. Likewise, we assess its ability to constrain hadronic interaction models.

[P225-2014] "Nanostructured porous silicon-mediated drug delivery"

Martin-Palma, R. J.; **Hernandez-Montelongo, J.***; Torres-Costa, V.; Manso-Silvan, M.; Munoz-Noval, A.

Introduction: The particular properties of nanostructured porous silicon (nanoPS) make it an attractive material for controlled and localized release of therapeutics within the body, aiming at increased efficacy and reduced risks of potential side effects. Since this is a rapidly evolving field as a consequence of the number of research groups involved,

a critical review of the state of the art is necessary. Areas covered: In this work, the most promising and successful applications of nanoPS in the field of drug delivery are reviewed and discussed. Two key issues such as drug loading and release are also analyzed in detail. The development of multifunctional (hybrid) systems, aiming at imparting additional functionalities to the nanoPS particles such as luminescence, magnetic response and/or plasmonic effects (allowing simultaneous tracking and guiding), is also examined. Expert opinion: Nanostructured materials based on silicon are promising platforms for pharmaceutical applications given their ability to degrade and low toxicity. However, a very limited number of clinical applications have been demonstrated so far.

[P226-2014] "Non-Markovianity through Accessible Information"

Fanchini, F. F.; Karpat, G.; Cakmak, B.; Castelano, L. K.; Aguilar, G. H.; Farias, O. J.; Walborn, S. P.; Souto Ribeiro, P. H.; **de Oliveira, M. C.***

The degree of non-Markovianity of quantum processes has been characterized in several different ways in the recent literature. However, the relationship between the non-Markovian behavior and the flow of information between the system and the environment through an entropic measure has not been yet established. We propose an entanglement-based measure of non-Markovianity by employing the concept of assisted knowledge, where the environment E, acquires information about a system S, by means of its measurement apparatus A. The assisted knowledge, based on the accessible information in terms of von Neumann entropy, monotonically increases in time for all Markovian quantum processes. We demonstrate that the signatures of non-Markovianity can be captured by the nonmonotonic behavior of the assisted knowledge. We explore this scenario for a two-level system undergoing a relaxation process, through an experimental implementation using an optical approach that allows full access to the state of the environment.

[P227-2014] "Novel Nanoscroll Structures from Carbon Nitride Layers"

Perim, E.*; Galvao, D. S.*

Nanoscrolls (papyrus-like nanostructures) are very attractive structures for a variety of applications, owing to their tunable diameter and large accessible surface area. They have been successfully synthesized from different materials. In this work, we investigate, through fully atomistic molecular dynamics simulations, the dynamics of scroll formation for a series of graphene-like carbon nitride (CN) two-dimensional systems: gCN, triazine-based g-C3N4, and heptazine-based g-C3N4. Our results show that stable nanoscrolls can be formed for each of these structures. Possible synthetic routes to produce these nanostructures are also addressed.

[P228-2014] "Observation of a peaking structure in the J/psi phi mass spectrum from B-+/- -> J/psi phi K-+/- decays"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

A peaking structure in the J/psi phi mass spectrum near threshold is observed in B-+/- -> J/psi phi K-+/- decays, produced in pp collisions at root s = 7 TeV collected with the CMS detector at the LHC. The data sample, selected on the basis of the dimuon decay mode of the J/psi, corresponds to an integrated luminosity of 5.2 fb(-1). Fitting the structure to an S-wave relativistic Breit-Wigner lineshape above a three-body phase-space nonresonant component gives a signal statistical significance exceeding five standard deviations. The fitted mass and width values are m = 4148.0 +/- 2.4 (stat.) +/- 6.3 (syst.) MeV and Gamma = 28(-11)(+15) (stat.) +/- 19 (syst.) MeV, respectively. Evidence for an additional peaking structure at higher J/psi phi mass is also reported.

[P229-2014] "Observation of muon intensity variations by season with the MINOS near detector"

Adamson, P.; Anghel, I.; Aurisano, A.; **Coelho, J. A. B.*; Escobar, C. O.***; et al.
MINOS Collaboration

A sample of 1.53 x 10(9) cosmic-ray-induced single muon events has been recorded at 225 m water equivalent using the MINOS near detector. The underground muon rate is observed to be highly correlated with the effective atmospheric temperature. The coefficient alpha(T), relating the change in the muon rate to the change in the vertical effective temperature, is determined to be 0.428 +/- 0.003(stat.) +/- 0.059(syst.). An alternative description is provided by the weighted effective temperature, introduced to account for the differences in the temperature profile and muon flux as a function of zenith angle. Using the latter estimation of temperature, the coefficient is determined to be 0.352 +/- 0.003(stat.) +/- 0.046(syst.).

[P230-2014] "Observation of the Associated Production of a Single Top Quark - and a W Boson in pp Collisions at root s=8 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli*; Bluj, M.***; et al.
CMS Collaboration

The first observation of the associated production of a single top quark and a W boson is presented. The analysis is based on a data set corresponding to an integrated luminosity of 12.2 fb(-1) of proton-proton collisions at root s = 8 TeV recorded by the CMS experiment at the LHC. Events with two leptons and a jet originating from a b quark are selected. A multivariate analysis based on kinematic and topological properties is used to separate the signal from the dominant (tt) over bar background. An excess consistent with the signal hypothesis is observed, with a significance which corresponds to 6.1 standard deviations above a background-only hypothesis. The measured production cross section is 23.4 +/- 5.4 pb, in agreement with the standard model prediction.

[P231-2014] "On the distinct molecular architectures of dipping- and spray-LbL films containing lipid vesicles"

Aoki, P. H. B.; Alessio, P.; Volpati, D.; Paulovich, F. V.; **Riul, A.***; Oliveira, O. N.; Constantino, C. J. L.

The introduction of spraying procedures to fabricate layer-by--layer (LbL) films has brought new possibilities for the control of molecular architectures and for making the LbL technique compliant with industrial processes. In this study we show that significantly distinct architectures are produced for dipping and spray-LbL films of the same components, which included DODAB/DPPG vesicles. The films differed notably in their thickness and stratified nature. The electrical response of the two types of films to aqueous solutions containing etythrosin was also different. With multidimensional projections we showed that the impedance for the DODAB/DPPG spray-LbL film is more sensitive to changes in concentration, being therefore more promising as sensing units. Furthermore, with surface--enhanced Raman scattering (SEES) we could ascribe the high sensitivity of the LbL films to adsorption of elythrosin.

[P232-2014] "On the solid-liquid phase diagrams of binary mixtures of even saturated fatty alcohols: Systems exhibiting peritectic reaction"

Carareto, N. D. D.; dos Santos, A. O.; Rolemberg, M. P.; **Cardoso, L. P.***; Costa, M. C., Mariana C.; Meirelles, A. J. A.

The solid-liquid phase diagrams of the following binary mixtures of even saturated fatty alcohols are reported in the literature for the first time: 1-octanol (C8OH) + 1-decanol (C10OH), 1-decanol + 1-dodecanol (C12OH), 1-dodecanol + 1-hexadecanol (C16OH) and 1-tetradecanol (C14OH) + 1-octadecanol (C18OH). The phase diagrams were obtained by differential scanning calorimetry (DSC) using a linear heating rate of 1 K min(-1) and further investigated by using a stepscan DSC method. X--ray diffraction (XRD) and polarized light microscopy were also used to complement the characterization of the phase diagrams which have shown a complex global behavior, presenting not only peritectic and eutectic reactions, but also the metatectic reaction and partial immiscibility on solid state.

[P233-2014] "Optical Bedside Monitoring of Cerebral Blood Flow in Acute Ischemic Stroke Patients During Head-of-Bed Manipulation"

Favilla, C. G.; **Mesquita, R. C.***; Mullen, M.; Durduran, T.; Lu, X. P.; Kim, M. N.; Minkoff, D. L.; Kasner, S. E.; Greenberg, J. H.; Yodh, A. G.; Detre, J. A.

Background and Purpose A primary goal of acute ischemic stroke (AIS) management is to maximize perfusion in the affected region and surrounding ischemic penumbra. However, interventions to maximize perfusion, such as flat head--of-bed (HOB) positioning, are currently prescribed empirically. Bedside monitoring of cerebral blood flow (CBF) allows the effects of interventions such as flat HOB to be monitored and may ultimately be used to guide clinical management. Methods Cerebral perfusion was measured during HOB manipulations in 17 patients with unilateral AIS affecting large cortical territories in the anterior circulation. Simultaneous measurements of frontal CBF and arterial flow velocity were performed with diffuse correlation spectroscopy and transcranial Doppler ultrasound, respectively. Results were analyzed in the context of available clinical data and a previous study. Results Frontal CBF, averaged over the patient cohort, decreased by 17% (P=0.034) and 15% (P=0.011) in the ipsilesional and contralesional hemispheres, respectively, when HOB was changed from flat to 30 degrees. Significant (cohort-averaged) changes in blood velocity were not observed.

Individually, varying responses to HOB manipulation were observed, including paradoxical increases in CBF with increasing HOB angle. Clinical features, stroke volume, and distance to the optical probe could not explain this paradoxical response. Conclusions A lower HOB angle results in an increase in cortical CBF without a significant change in arterial flow velocity in AIS, but there is variability across patients in this response. Bedside CBF monitoring with diffuse correlation spectroscopy provides a potential means to individualize interventions designed to optimize CBF in AIS.

[P234-2014] "Optimal driving of isothermal processes close to equilibrium"

Bonanca, M. V. S.*; Deffner, S.

We investigate how to minimize the work dissipated during nonequilibrium processes. To this end, we employ methods from linear response theory to describe slowly varying processes, i.e., processes operating within the linear regime around quasistatic driving. As a main result, we find that the irreversible work can be written as a functional that depends only on the correlation time and the fluctuations of the generalized force conjugated to the driving parameter. To deepen the physical insight of our approach, we discuss various self--consistent expressions for the response function, and derive the correlation time in closed form. Finally, our findings are illustrated with several analytically solvable examples.

[P235-2014] "Organometallic Preparation of Ni, Pd, and NiPd Nanoparticles for the Design of Supported Nanocatalysts"

Costa, N. J. S.; Guerrero, M.; Colliere, V.; Teixeira-Neto, E.; **Landers, R.***; Philippot, K.; Rossi, L. M.

The preparation of bimetallic nanoparticles with controlled size, shape, and composition remains a difficult task, and reproducible methods are highly desired. Here, we report the codecomposition of Ni(cod)(2) and Pd-2(dba)(3) organometallic precursors in the presence of hexadecylamine (HDA) and hydrogen as an efficient approach to get size-controlled bimetallic nickel palladium nanoparticles. Presynthesized nickel palladium nanoparticles of different Ni/Pd ratios were further used for the preparation of supported catalysts by the sol-immobilization method onto a magnetic silica. The obtained supported catalysts were investigated in the hydrogenation of cyclohexene and compared to Ni and Pd monometallic catalysts. The catalysts prepared with a 1:9 Ni/Pd molar ratio achieved the highest initial turnover frequency > 50000 h(-1), providing higher activity than the pure Pd monometallic counterpart. This represents an important saving of noble metal. Moreover, the magnetic separation allows excellent separation of the catalyst from the liquid products without metal leaching and exposure to air, leading to an efficient recycling.

[P236-2014] "Out-of-plane magnetic anisotropy in columnar grown Fe-Ni films"

Pires, M. J. M.; Araujo, M. S.; **Tedesco, J. C. G.***; Ardisson, J. D.; Macedo, W. A. A.

Polycrystalline thin films usually present magnetic anisotropy resulting from a conjunction of textures, residual stresses, surface effects, and magnetic dipole distribution. The shape anisotropy, which is caused by the magnetic dipole distribution, is dominant in most of the cases, and it forces the occurrence of in-plane easy axes for the magnetization. Contrary to this common expectation, we have found predominant out-of-plane easy axes in a series of Fe-Ni thin films produced by DC sputtering. Films with different thicknesses, from 40 to 1000 nm, and different deposition temperatures have been tested and show similar results. These unusual characteristics are results of a particular columnar structure formed during the films growth. The magnetic characterization of the samples has been done by Mossbauer spectroscopy, magnetometry, and ferromagnetic resonance. The unusual anisotropy observed is not believed to be uniform along the film thickness. This interpretation comes from the comparison of the experimental results with hysteresis obtained by micromagnetic simulations. Five distinct configurations for the anisotropies have been simulated for this comparison.

[P237-2014] "Patterning Quasi-Periodic Co 2D-Clusters underneath Graphene on SiC(0001)"

de Lima, L. H.*; Landers, R.*; de Siervo, A.*

The behavior of Co nanoparticles (NPs) grown on graphene/SiC(0001) after oxygen exposure and heating in ultrahigh vacuum is investigated. The results of photoelectron spectroscopy (XPS) show that, as grown, the metal is on the surface of the graphene/SiC and suffers oxidation forming a single phase CoO when exposed to O-2, even at low doses. After heating in ultrahigh vacuum (UHV), there is a deoxidation of cobalt and intercalation between the graphene (G) and the buffer layer (BL), as indicated by scanning tunneling microscopy (STM) and XPS. Cobalt forms almost regular small 2D clusters between G and BL. Moreover, graphene acts as a barrier to oxidation, preserving the metallic and the magnetic character of the material even when exposed to O-2. This paper shows a method for patterning chemically protected Co NPs on graphene/SiC(0001) which could be used in nanomagnetism based devices.

[P238-2014] "Photonic-crystal fiber-based pressure sensor for dual environment monitoring"

Osorio, J. H.*; Hayashi, J. G.*; Espinel, Y. A. V.*; Franco, M. A. R.; Andres, M. V.; Cordeiro, C. M. B.*

In this paper the development of a side-hole photonic-crystal fiber (SH-PCF) pressure sensor for dual environment monitoring is reported. SH-PCF properties (phase and group birefringence, sensitivity to pressure variations) are measured and compared to simulated data. In order to probe two environments, two sections of the SH-PCF with different lengths are spliced and set in a Solc filter-like configuration. This setup allows obtaining the individual responses of the first and second fiber independently, which is useful for a space-multiplexed measurement. As the employed fiber is sensitive to pressure variations, we report the use of this configuration for dual environment pressure sensing.

[P239-2014] "Physicochemical Studies of Complex Silver-Magnetite Nanoheterodimers with Controlled Morphology"

Moscoso-Londono, O.; Muraca, D.*; Tancredi, P.; Cosio-Castaneda, C.; Pirota, K. R.*; Socolovsky, L. M.

This work discusses the influence of synthesis conditions on self-assembly capability and morphology of obtained Ag-Fe3O4 nanoheterostructures. Samples were synthesized in two steps: first silver nanoparticles were synthesized and then used as seeds for the growth of iron oxide nanoparticles in a second step. The silver nanoparticle size was tuned, changing the oleylamine (OAm) and oleic acid (OA) ratio, which enables us to study the influence of chemical agents and seed size on the final magnetic nanoparticle morphology. The mechanism during the formation of these heterostructures has been discussed by several authors; however, it remains an open issue. In this paper we extend the discussion and advance on the understanding of synthesis conditions, related to silver sizes, chemical agents, and physical properties on the obtained nanoparticles. In our Ag-Fe3O4 system, two types of heterostructures were obtained: dimer, flower, or combination of the two. We have found that the final shape depends on silver seed size, as well as the polarity of the chemical agents used during the synthesis. We made an exhaustive study of the relationship between magnetic properties and structural features. The morphology and size distributions of the heterostructures were analyzed with transmission electron microscopy (TEM).

[P240-2014] "Probing color coherence effects in pp collisions at root s=7 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; Chinellato, J.*; Manganote, E. J. Tonelli*; et al.
CMS Collaboration

A study of color coherence effects in pp collisions at a center-of-mass energy of 7 is presented. The data used in the analysis were collected in 2010 with the CMS detector at the LHC and correspond to an integrated luminosity of 36 pb. Events are selected that contain at least three jets and where the two jets with the largest transverse momentum exhibit a back-to-back topology. The measured angular correlation between the second- and third-leading jet is shown to be sensitive to color coherence effects, and is compared to the predictions of Monte Carlo models with various implementations of color coherence. None of the models describe the data satisfactorily.

[P241-2014] "Search for Flavor-Changing Neutral Currents in Top-Quark Decays t -> Zq in pp Collisions at root s=8 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; Chinellato, J.*; Manganote, E. J. Tonelli*; et al.
CMS Collaboration

A search for flavor-changing neutral currents in top-quark decays t -> Zq is performed in events produced from the decay chain (tt) over bar -> Zq + Wb, where both vector bosons decay leptonically, producing a final state with three leptons (electrons or muons). A data set collected with the CMS detector at the LHC is used, corresponding to an integrated luminosity of 19.7 fb(-1) of proton-proton collisions at a center-of-mass energy of 8 TeV. No excess is seen in the observed number of events relative to the standard model prediction; thus, no evidence for flavor-changing neutral currents in top-quark decays is found.

A combination with a previous search at 7 TeV excludes a t. Zq branching fraction greater than 0.05% at the 95% confidence level.

[P242-2014] "Search for new physics in events with same--sign dileptons and jets in pp collisions at root s=8 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

A search for new physics is performed based on events with jets and a pair of isolated, same-sign leptons. The results are obtained using a sample of proton-proton collision data collected by the CMS experiment at a centre-of-mass energy of 8TeV at the LHC, corresponding to an integrated luminosity of 19.5 fb(-1). In order to be sensitive to a wide variety of possible signals beyond the standard model, multiple search regions defined by the missing transverse energy, the hadronic energy, the number of jets and b-quark jets, and the transverse momenta of the leptons in the events are considered. No excess above the standard model background expectation is observed and constraints are set on a number of models for new physics, as well as on the same-sign top-quark pair and quadruple-top--quark production cross sections. Information on event selection efficiencies is also provided, so that the results can be used to confront an even broader class of new physics models.

[P243-2014] "Search for new physics in the multijet and missing transverse momentum final state in proton-proton collisions at root s=8 Tev"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

A search for new physics is performed in multijet events with large missing transverse momentum produced in proton-proton collisions at root s = 8TeV using a data sample corresponding to an integrated luminosity of 19.5 fb(-1) collected with the CMS detector at the LHC. The data sample is divided into three jet multiplicity categories (3-5, 6-7, and >= 8 jets), and studied further in bins of two variables: the scalar sum of jet transverse momenta and the missing transverse momentum. The observed numbers of events in various categories are consistent with backgrounds expected from standard model processes. Exclusion limits are presented for several simplified supersymmetric models of squark or gluino pair production.

[P244-2014] "Search for pair production of excited top quarks in the lepton plus jets final state"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

A search is performed for pair-produced spin-3/2 excited top quarks , each decaying to a top quark and a gluon. The search uses data collected with the CMS detector from pp collisions at a center-of-mass energy of = 8 TeV, selecting events that have a single isolated muon or electron, an imbalance in transverse momentum, and at least six jets, of which one must be compatible with originating from the fragmentation of a b quark.

The data, corresponding to an integrated luminosity of 19.5 fb(-1), show no significant e xcess over standard model predictions, and provide a lower limit of 803 GeV at 95% confidence on the mass of the spin-3/2 t(*) quark in an extension of the Randall-Sundrum model, assuming a 100% branching fraction of its decay into a top quark and a gluon. This is the first search for a spin-3/2 excited top quark performed at the LHC.

[P245-2014] "Search for supersymmetry in pp collisions at root s=8 TeV in events with a single lepton, large jet multiplicity, and multiple b jets"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; Manganote, E. J. Tonelli***; Bluj, M.*; et al.
CMS Collaboration

Results are reported from a search for supersymmetry in pp collisions at a center-of-mass energy of 8 TeV, based on events with a single isolated lepton (electron or muon) and multiple jets, at least two of which are identified as b jets. The data sample corresponds to an integrated luminosity of 19.3 fb(-1) recorded by the CMS experiment at the LHC in 2012. The search is motivated by supersymmetric models that involve strong-production processes and cascade decays of new particles. The resulting final states contain multiple jets as well as missing transverse momentum from weakly interacting particles. The event yields, observed across several kinematic regions, are consistent with the expectations from standard model processes. The results are interpreted in the context of simplified supersymmetric scenarios with pair production of gluinos, where each gluino decays to a top quark-antiquark pair and the lightest neutralino. For the case of decays via virtual top squarks, gluinos with a mass smaller than 1.26 TeV are excluded for low neutralino masses.

[P246-2014] "Search for Top Squark and Higgsino Production Using Diphoton Higgs Boson Decays"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

Results are presented of a search for a "natural" supersymmetry scenario with gauge mediated symmetry breaking. It is assumed that only the supersymmetric partners of the top quark (the top squark) and the Higgs boson (Higgsino) are accessible. Events are examined in which there are two photons forming a Higgs boson candidate, and at least two b-quark jets. In 19.7 fb(-1) of proton-proton collision data at root s = 8 TeV, recorded in the CMS experiment, no evidence of a signal is found and lower limits at the 95% confidence level are set, excluding the top squark mass below 360 to 410 GeV, depending on the Higgsino mass.

[P247-2014] "Search for W ' -> tb decays in the lepton plus jets final state in pp collisions at root s=8 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.***; Manganote, E. J. Tonelli***; et al.
CMS Collaboration

Results are presented from a search for the production of a heavy gauge boson W' decaying into a top and a bottom quark, using a data set collected by the CMS experiment at root s = 8 TeV and corresponding to an integrated luminosity of 19.5 fb(-1). Various models of W'-boson production are studied by allowing for an arbitrary combination of left-and right-handed couplings. The analysis is based on the detection of events with a lepton (e, mu), jets, and missing transverse energy in the final state. No evidence for W'-boson production is found and 95% confidence level upper limits on the production cross section times branching fraction are obtained. For W' bosons with purely right-handed couplings, and for those with left-handed couplings assuming no interference effects, the observed 95% confidence level limit is M(W') > 2.05TeV. For W' bosons with purely left-handed couplings, including interference effects, the observed 95% confidence level limit is M(W') > 1.84 TeV. The results presented in this paper are the most stringent limits published to date.

[P248-2014] "Searching for a nondiagonal mass varying mechanism in the nu(mu) - nu(tau) system"

Gratieri, D. R.*; Peres, O. L. G.*

We use atmospheric neutrino data and MINOS data to constrain the MaVaN (mass varying neutrinos) mechanism. The MaVaN model was largely studied in cosmology scenarios and comes from the coupling of the neutrinos with a neutral scalar depending on the local matter density. For atmospheric neutrinos, this new interaction affects the neutrino propagation inside the Earth, and as consequence, induces modifications in their oscillation pattern. To perform such test for a nonstandard oscillation mechanism with a nondiagonal neutrino coupling in the mass basis, we analyze the angular distribution of atmospheric neutrino events as seen by the Super-Kamiokande experiment for the events in the sub-GeVand multi-GeV range and muon neutrinos (antineutrinos) in the MINOS experiment. From the combined analysis of these two sets of data we obtain the best fit for Delta m(32)(2) = 2.45 x 10(-3) eV(2), sin(2)(theta(23)) = 0.42 and MaVaN parameter alpha(32) = 0.28 with modest improvement, Delta chi(2) = 1.8, over the standard oscillation scenario. The combination of MINOS data and Super-Kamiokande data prefers small values of MaVaN parameter alpha(32) < 0.31 at 90% C. L.

[P249-2014] "Second harmonic generation microscopy as a powerful diagnostic imaging modality for human ovarian cancer"

Adur, J.*; Pelegati, V. B.*; de Thomaz, A. A.*; Baratti, M. O.; Andrade, L. A.; Carvalho, H. F.; Bottcher-Luiz, F.; Cesar, C. L.*

In this study we showed that second-harmonic generation (SHG) microscopy combined with precise methods for images evaluation can be used to detect structural changes in the human ovarian stroma. Using a set of scoring methods (alignment of collagen fibers, anisotropy, and correlation), we found significant differences in the distribution and organization of collagen fibers in the stroma component of serous, mucinous, endometrioid and mixed ovarian tumors as compared with normal ovary tissue. This methodology was capable to differentiate between cancerous and healthy tissue, with clear cut distinction between normal, benign, borderline, and malignant tumors of serous type. Our results indicated that the combination of different image-analysis approaches presented here represent a powerful tool to investigate collagen organization and extracellular matrix remodeling in ovarian tumors.

[P250-2014] "SHARE with CHARM"

Petran, M.; Letessier, J.; Rafelski, J.; Torrieri, G.*

SHARE with CHARM program (SHAREv3) implements the statistical hadronization model description of particle production in relativistic heavy-ion collisions. Given a set of statistical parameters, SHAREv3 program evaluates yields and therefore also ratios, and furthermore, statistical particle abundance fluctuations. The physical bulk properties of the particle source are evaluated based on all hadrons produced, including the fitted yields. The bulk properties can be prescribed as a fit input complementing and/or replacing the statistical parameters. The modifications and improvements in the SHARE suite of programs are oriented towards recent and forthcoming LHC hadron production results including charm hadrons. This SHAREv3 release incorporates all features seen previously in SHAREv1.x and v2.x and, beyond, we include a complete treatment of charm hadrons and their decays, which further cascade and feed lighter hadron yields. This article is a complete and self-contained manual explaining and introducing both the conventional and the extended capabilities of SHARE with CHARM. We complement the particle list derived from the Particle Data Group tabulation (Beringer, 2012) composed of up, down, strange u,d,s quarks (including resonances) with hadrons containing charm c,c quarks. We provide a table of the charm hadron decays including partial widths. The branching ratios of each charm hadron decay add to unity, which is achieved by including some charm hadron decay channels based on theoretical consideration in the absence of direct experimental information. A very successful interpretation of all available LHC results has been already obtained using this program.

[P251-2014] "Simulating radial dose of ion tracks in liquid water simulated with Geant4-DNA: A comparative study"

Incerti, S.; Psaltaki, M.; Gillet, P.; Barberet, P.; Bardiees, M.; Bernal, M. A.*; et al.
Geant4-DNA Collaboration

An accurate modeling of radial energy deposition around ion tracks is a key requirement of radiation transport software used for simulations in radiobiology at the sub-cellular scale. The work presented in this paper is part of the on-going benchmarking of the "Geant4-DNA" physics processes and models, which are available in the Geant4 Monte Carlo simulation toolkit for the low energy transport of particles in liquid water. We present for the first time radial dose distributions of incident ion tracks simulated with "Geant4-DNA". Simulation results are compared to other results available in the literature, obtained from analytical calculations, step-by-step Monte Carlo simulations and measurements. They show a reasonable agreement with reference data.

[P252-2014] "Structural brain abnormalities are related to retinal nerve fiber layer thinning and disease duration in neuromyelitis optica spectrum disorders"

von Glehn, F.; Jarius, S.; Lira, R. P. C.; Ferreira, M. C. A.; von Glehn, F. H. R.; Castro, S. M. C. E. **Beltramini, G. C.***; Bergo, F. P. G.; Farias, A. S.; Brandao, C. O.; Wildemann, B.; Damasceno, B. P. Cendes, F.; Santos, L. M. B.; Yasuda, C. L.

Background: Although aquaporin-4 (AQP4) is widely expressed in the human brain cortex, lesions are rare in neuromyelitis optica (NMO) spectrum disorders (NMOSD). Recently, however, several studies have demonstrated occult structural brain atrophy in NMO. Objective: This study aims to investigate magnetic resonance imaging (MRI) patterns of gray matter (GM) and white matter (WM) abnormalities in patients with NMOSD and to assess the visual pathway integrity during disease duration correlation of the retinal nerve fiber layer (RNFL) and pericalcarine cortex thickness. Methods: Twenty-one patients with NMOSD and 34 matched healthy controls underwent both high-field MRI (3T) high-resolution T1-weighted and diffusion-tensor MRI. Voxel-based morphometry, cortical analyses (Freesurfer) and diffusion-tensor imaging (DTI) analyses (TBSS-FSL) were used to investigate brain abnormalities. In addition, RNFL measurement by optic-coherence tomography (OCT) was performed. Results: We demonstrate that NMOSD is associated with GM and WM atrophy, encompassing more frequently the motor, sensory and visual pathways, and that the extent of GM atrophy correlates with disease duration. Furthermore, we demonstrate for the first time a correlation between RNFL and pericalcarine cortical thickness, with cortical atrophy evolving over the course of disease. Conclusions: Our findings indicate a role for retrograde and anterograde neurodegeneration in GM atrophy in NMOSD. However, the presence atrophy encompassing almost all lobes suggests that additional pathomechanisms might also be involved.

[P253-2014] "Studies of dijet transverse momentum balance and pseudorapidity distributions in pPb collisions at root s(NN)=5.02 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; **Chinellato, J.*; Manganote, E. J. Tonelli*;** et al.
CMS Collaboration

Dijet production has been measured in collisions at a nucleon-nucleon centre-of-mass energy of 5.02. A data sample corresponding to an integrated luminosity of 35 was collected using the Compact Muon Solenoid detector at the Large Hadron Collider. The dijet transverse momentum balance, azimuthal angle correlations, and pseudorapidity distributions are studied as a function of the transverse energy in the forward calorimeters (). For collisions, the dijet transverse momentum ratio and the width of the distribution of dijet azimuthal angle difference are comparable to the same quantities obtained from a simulated reference and insensitive to . In contrast, the mean value of the dijet pseudorapidity is found to change monotonically with increasing , indicating a correlation between the energy emitted at large pseudorapidity and the longitudinal motion of the dijet frame. The pseudorapidity distribution of the dijet system in minimum bias collisions is compared with next-to-leading-order perturbative QCD predictions obtained from both nucleon and nuclear parton distribution functions, and the data more closely match the latter.

[P254-2014] "Study of the production of charged pions, kaons, and protons in pPb collisions at root SNN=5.02 TeV"

Chatrchyan, S.; Khachatryan, V.; Sirunyan, A. M.; Chinellato, J.*; Manganote, E. J. Tonelli*; Bluj, M.*; **et al.**
CMS Collaboration

Spectra of identified charged hadrons are measured in pPb collisions with the CMS detector at the LHC at . Charged pions, kaons, and protons in the transverse-momentum range -1.7 and laboratory rapidity are identified via their energy loss in the silicon tracker. The average increases with particle mass and the charged multiplicity of the event. The increase of the average with charged multiplicity is greater for heavier hadrons. Comparisons to Monte Carlo event generators reveal that Epos Lhc, which incorporates additional hydrodynamic evolution of the created system, is able to reproduce most of the data features, unlike Hijing and Ampt. The spectra and integrated yields are also compared to those measured in pp and PbPb collisions at various energies. The average transverse momentum and particle ratio measurements indicate that particle production at LHC energies is strongly correlated with event particle multiplicity.

[P255-2014] "Suppression of Upsilon production in d plus Au and Au plus Au collisions at root S-NN=200 GeV"

Adamczyk, L.; Adkins, J. K.; Agakishiev, **G. de Souza, R. Derradi*; Vasconcelos, G. M. S.*;** et al.
Star Collaboration

We report measurements of Upsilon meson production in p + p, d + Au, and Au + Au collisions using the STAR detector at RHIC. We compare the Upsilon yield to the measured cross section in p + p collisions in order to quantify any modifications of the yield in cold nuclear matter using d + Au data and in hot nuclear matter using Au + Au data separated into three centrality classes. Our p + p measurement is based on three times the statistics of our previous result. We obtain a nuclear modification factor for Upsilon (1S + 2S + 3S) in the rapidity range vertical bar y vertical bar < 1 in d + Au collisions of R-dAu = 0.79 +/- 0.24(stat.) +/- 0.03(syst.) +/- 0.10(p + p syst.). A comparison with models including shadowing and initial state parton energy loss indicates the presence of additional cold-nuclear matter suppression. Similarly, in the top 10% most-central Au + Au collisions, we measure a nuclear modification factor of R-AA = 0.49 +/- 0.1(stat.) +/- 0.02(syst.) +/- 0.06(p + p syst.), which is a larger suppression factor than that seen in cold nuclear matter. Our results are consistent with complete suppression of excited-state Upsilon mesons in Au + Au collisions. The additional suppression in Au + Au is consistent with the level expected in model calculations that include the presence of a hot, deconfined Quark-Gluon Plasma. However, understanding the suppression seen in d + Au is still needed before any definitive statements about the nature of the suppression in Au + Au can be made.

[P256-2014] "Surface, thermal, and mechanical properties of composites and nanocomposites of polyurethane/PTFE nanoparticles"

Anbinder, P. S.; Peruzzo, P. J.; **de Siervo, A.*;** Amalvy, J. I.

Films from blends of polyurethane and nano-polytetrafluoroethylene aqueous dispersions (PU/nanoPTFE) were prepared, and the effect of the addition of different amounts of PTFE nanoparticles (50 nm) was studied. The changes in the superficial properties of the films were studied by means of XPS, ATR/FTIR, and contact angle measurements. SEM and TEM results are also included. The contact angle values confirm the surface hydrophobicity of composite films. Even though nanoparticles are present in the bulk, higher concentrations of particles appear at the surface in samples with lower nanoPTFE content (up to 10 wt%),

as revealed by XPS. Higher amounts of nanoPTFE particles cause aggregation. The mechanical and thermal properties of composites are also discussed.

[P257-2014] "Technical Design Report for the Upgrade of the ALICE Inner Tracking System"

Abelev, B.; Adam, J.; Adamova, D.; **Chinellato, D. D.*; Dash, A.*; Takahashi, J.*;** et al.
ALICE Collaboration

ALICE (A Large Ion Collider Experiment) is studying the physics of strongly interacting matter, and in particular the properties of the Quark-Gluon Plasma (QGP), using proton-proton, proton-nucleus and nucleus-nucleus collisions at the CERN LHC (Large Hadron Collider). The ALICE Collaboration is preparing a major upgrade of the experimental apparatus, planned for installation in the second long LHC shutdown in the years 2018-2019. A key element of the ALICE upgrade is the construction of a new, ultra-light, high-resolution Inner Tracking System (ITS) based on monolithic CMOS pixel detectors. The primary focus of the ITS upgrade is on improving the performance for detection of heavy-flavour hadrons, and of thermal photons and low-mass di-electrons emitted by the QGP. With respect to the current detector, the new Inner Tracking System will significantly enhance the determination of the distance of closest approach to the primary vertex, the tracking efficiency at low transverse momenta, and the read-out rate capabilities. This will be obtained by seven concentric detector layers based on a 50 µm thick CMOS pixel sensor with a pixel pitch of about 30×30 µm2. This document, submitted to the LHCC (LHC experiments Committee) in September 2013, presents the design goals, a summary of the R&D activities, with focus on the technical implementation of the main detector components, and the projected detector and physics performance.

[P258-2014] "The cosmic ray veto system of the Mario Schenberg gravitational wave detector"

Da Silva Costa, C. F.; **Fauth, A. C.*;** Pereira, L. A. S.; Aguiar, O. D.

The Mario Schenberg gravitational wave antenna is a spherical cryogenic resonant mass detector located at IFUSP, Sao Paulo, It is well known that cosmic rays interact with cryogenic resonant mass detectors generating acoustic signals. Depending on the shower energy, they could provide a substantial background noise which should be vetoed to reduce the false alarm rate. For this purpose, in December 2011, we have installed a cosmic ray veto system which is, since then, acquiring data. The cosmic ray veto system is composed of three particle detectors containing each one a scintillator, a photomultiplier and a tension divider. As the shower number of particles is used to define a threshold for the veto, it is important that the cosmic ray veto provides a linear response to high-energy cosmic ray events. The veto setup response was optimized and allows measurements up to 23,000 equivalent muon charge particles per square meter. We present here the experimental setup, its calibration and performance. Finally, to confirm the linearity of the data acquisition we show the measured particle multiplicity.

[P259-2014] "Thermal conductivity in higher-order generalized hydrodynamics: Characterization of nanowires of silicon and gallium nitride"

Rodrigues, C. G.; **Vasconcellos, A. R.*; Luzzi, R.***

An analysis of the influence of geometry and size on the thermal conductivity in semiconductors, particularized to the study in Si and GaN, is presented. This is done in the framework of a higher-order generalized hydrodynamics (HOGH) of phonons in semiconductors, driven away from equilibrium by external sources. This HOGH is derived by the method of moments from a generalized Peierls-Boltzmann kinetic equation built in the framework of a Non-Equilibrium Statistical Ensemble Formalism. We consider the case of wires (cylindrical geometry) exploring the effect of size (radius), particularly in the nanometric scale when comparison with experiment is done. Maxwell times, which are quite relevant to define the hydrodynamic movement, are evidenced and characterized

[P260-2014] "Thermal expansion behavior of holes in graphene nanomeshes"

Mosterio, N. C. B.; **Fonseca, A. F.***

The thermal expansion of a hole, in a planar system, follows the same trend as the thermal expansion of the whole system, i.e., the hole expands (contracts) if the material expands (contracts) under thermal excitation. At nanoscale, this phenomenon has not been studied so far. Here, using tools of classical molecular dynamics simulations, we show that graphene nanomeshes (GNMs) behave oppositely: While the whole structure contracts (expands), the nanoholes expand (contract) under thermal excitation. We propose and test a simple mechanism to describe this unexpected behavior in terms of out-of-plane vibrations of the atoms close to and far from the edges of the holes. This mechanism allows us to see that, contrary to usual planar systems, this behavior comes from nonuniform thermal expansion along the structure. Although the thermal expansion of holes in GNMs is contrary to the classical prediction, we verify that the thermal expansion of the whole GNM structure is the same as that of pristine graphene.

[P261-2014] "Toward a theory of topopatric speciation: The role of genetic assortative mating"

Schneider, D. M.*; do Carmo, E.; **Martins, A. B.*; de Aguiar, M. A. M.***

We discuss a minimalist model of assortative mating for sexually reproducing haploid individuals with two biallelic loci. Assortativeness is introduced in the model by preventing mating between individuals whose alleles differ at both loci. Using methods of dynamical systems and population genetics we provide a full description of the evolution of the system for the case of very large populations. We derive the equations governing the evolution of haplotype frequencies and study the equilibrium solutions, stability, and speed of convergence to equilibrium.

We find a constant of motion which allows us to introduce a geometrical construction that makes it straightforward to predict the fate of initial conditions. Finally, we discuss the consequences of this class of assortative mating models, including their possible extensions and implications for sympatric and topopatric speciation.

[P262-2014] "Transcription Factors Involved in Prostate Gland Adaptation to Androgen Deprivation"

Rosa-Ribeiro, R.; Nishan, U.; Vidal, R. O.; Barbosa, G. O.; Reis, L. O.; **Cesar, C. L.***; Carvalho, H. F.

Androgens regulate prostate physiology, and exert their effects through the androgen receptor. We hypothesized that androgen deprivation needs additional transcription factors to orchestrate the changes taking place in the gland after castration and for the adaptation of the epithelial cells to the androgen-deprived environment, ultimately contributing to the origin of castration-resistant prostate cancer. This study was undertaken to identify transcription factors that regulate gene expression after androgen deprivation by castration (Cas). For the sake of comparison, we extended the analysis to the effects of administration of a high dose of 17 beta-estradiol (E2) and a combination of both (Cas+ E2). We approached this by (i) identifying gene expression profiles and enrichment terms, and by searching for transcription factors in the derived regulatory pathways; and (ii) by determining the density of putative transcription factor binding sites in the proximal promoter of the 10 most up- or down-regulated genes in each experimental group in comparison to the controls Gapdh and Tbp7. Filtering and validation confirmed the expression and localized EVI1 (Mecom), NFY, ELK1, GATA2, MYBL1, MYBL2, and NFkB family members (NFkB1, NFkB2, REL, RELA and RELB) in the epithelial and/or stromal cells. These transcription factors represent major regulators of epithelial cell survival and immaturity as well as an adaptation of the gland as an immune barrier in the absence of functional stimulation by androgens. Elk1 was expressed in smooth muscle cells and was up-regulated after day 4. Evi1 and Nfy genes are expressed in both epithelium and stroma, but were apparently not affected by androgen deprivation.

[P263-2014] "Unzipping Carbon Nanotubes at High Impact"

Ozden, S.; **Autreto, P. A. S.***; Tiwary, C. S.; Khatiwada, S.; **Machado, L.***; **Galvao, D. S.***; Vajtai, R.; Barrera, E. V.; Ajayan, P. M.

The way nanostructures behave and mechanically respond to high impact collision is a topic of intrigue. For anisotropic nanostructures, such as carbon nanotubes, this response will be complicated based on the impact geometry. Here we report the result of hypervelocity impact of nanotubes against solid targets and show that impact produces a large number of defects in the nanotubes, as well as rapid atom evaporation, leading to their unzipping along the nanotube axis. Fully atomistic reactive molecular dynamics simulations are used to gain further insights of the pathways and deformation and fracture mechanisms of nanotubes under high energy mechanical impact. Carbon nanotubes have been unzipped into graphene nanoribbons before using chemical treatments but here the instability of nanotubes against formation, fracture, and unzipping is revealed purely through mechanical impact defect.

[P264-2014] "Upgrade of the ALICE Experiment Letter Of Intent"

Abelev, B.; Adam, J.; Adamova, D.; **Dash, A.***; **Takahashi, J.***; et al.
ALICE Collaboration

ALICE (A Large Ion Collider Experiment) is studying the physics of strongly interacting matter, and in particular the properties of the Quark-Gluon Plasma (QGP), using proton-proton, proton-nucleus and nucleus-nucleus collisions at the CERN LHC (Large Hadron Collider). The ALICE Collaboration is preparing a major upgrade of the experimental apparatus, planned for installation in the second long LHC shutdown in the years 2018-2019. These plans are presented in the ALICE Upgrade Letter of Intent, submitted to the LHCC (LHC experiments Committee) in September 2012. In order to fully exploit the physics reach of the LHC in this field, high-precision measurements of the heavy-flavour production, quarkonia, direct real and virtual photons, and jets are necessary. This will be achieved by an increase of the LHC Pb-Pb instant luminosity up to 6×10^{27} cm^{-2}s^{-1} and running the ALICE detector with the continuous readout at the 50 kHz event rate. The physics performance accessible with the upgraded detector, together with the main detector modifications, are presented.

[P265-2014] "Voxel-based morphometry and intellectual assessment in patients with congenital bilateral perisylvian syndrome"

Yasuda, C. L.; Guimaraes, C. A.; Guerreiro, M. M.; Boscariol, M.; Oliveira, E. P. M.; Teixeira, K. C.; Costa, A. L. F.; **Beltramini, G. C.***; Cendes, F.

Congenital bilateral perisylvian syndrome (CBPS) presents with heterogeneous clinical manifestations such as pseudobulbar palsy, language disorder, variable cognitive deficits, epilepsy, and perisylvian abnormalities (most frequently polymicrogyria) on imaging studies. We investigated the relationship between seizures and extent of gray matter (GM) and white matter (WM) abnormalities using voxel-based morphometry (VBM) of brain magnetic resonance imaging (MRI) as well the association between seizures, structural abnormalities and cognitive ability. In this cross-sectional study, we evaluated 51 healthy volunteers and 18 patients with CBPS with epilepsy (seizure group, n = 7) and without (non-seizure group, n = 11). We used VBM (SPM8/DARTEL) to investigate areas with excess and atrophy of both gray and white matter, comparing groups of patients with controls. Intellectual ability of patients was assessed by the WISC-III or WAIS-III. Both groups with CBPS and the control group were homogeneous with respect to gender (p = 0.07) and age (p = 0.065). Besides perisylvian polymicrogyria, the seizure group exhibited areas with GM and WM reduction including temporal, frontal, parietal and occipital lobes. In contrast, we identified fewer areas with GM and WM reduction in the non-seizure group. The seizure group presented worse intellectual performance (performance IQ and global IQ) than the non-seizure group. The seizure group presented with a more widespread pattern of cortical and sub-cortical abnormalities, as well as worse cognition. Our results suggest that patients with CBPS and epilepsy appear to have widespread neuronal damage that goes beyond the areas with MRI-visible perisylvian polymicrogyria.

Proceedings

[P266-2014] "Comparison of Plasma Visible Spectral Emissions Between Nova-UNICAMP and TCABR Tokamaks"

Nascimento, F.*; Machida, M.*; Ronchi, G.*; Schmutzler, L. M. F.*; Severo, J. H. F.; Nascimento, I. C.; Sanada, E. K.; IOP (Ed.)

A comparison between the visible spectrum emissions observed on the Nova-UNICAMP and TCABR tokamak plasmas has been made in this work using a hand top HR4000 Ocean Optics spectrometer equipped with a CCD detector. A number of 58 emission lines, in which 22 are common to both machines, have been observed and identified. The differences in the observed spectrum can be explained by the difference in the time integration used in these measurements and by the materials compositions of the limiter and electrode in the TCABR tokamak. Nearby peak emissions have been separated using multi-peak Gaussian fit curves obtaining separation between peak centres with the same order of the spectrometer resolution. The HR4000 spectrometer can be routinely used to monitor the impurity species in the visible spectrum from the different tokamak windows.

[P267-2014] "Effects of Jets in the Flow Observables"

Takahashi, J.*; de Souza, R. D.*; Chinellato, D. D.*
Evans D. (Ed.); Hands S. (Ed.); Lietava R. (Ed.); Romita R. (Ed.); Baillie O. V. (Ed.)

The transverse momentum anisotropy of the particles produced in heavy ion collisions is one of the most important experimental observable to investigate the collective behavior of the systems created in such collisions. Recent studies show that the complex nature of the system evolution, such as initial condition fluctuations and jets, may lead to important effects in the flow coefficients and, therefore, to misinterpretation of the results obtained. In this study, we used simulated events produced with a hydrodynamic model which allows inhomogeneous initial condition combined with proton-proton collisions produced with the Pythia event generator to create a final set of particles to be analyzed with the usual experimental flow calculation techniques. Although this simplified approach is somehow unrealistic, since it does not include the interaction of the jet with the medium, our results have shown a good agreement of the behavior of the elliptic flow coefficient as a function of the transverse momentum up to 6 GeV/c for Au+Au collisions at 200 GeV. Although each model alone is not able to describe the full range, the combination of both sets of particles as seen by the flow calculation techniques may be the key to explain the behavior observed in experimental data.

[P268-2014] "Electron inertia effect on floating plasma potential"

Duarte, V. N.*; Clemente, R. A.*; IOP (Ed.)

The steady one-dimensional planar plasma sheath problem, originally considered by Tonics and Langmuir, is revisited. Two-fluid equations for cold ions and isothermal electrons, including terms for particle generation and electron inertia, have been numerically integrated together with Poisson equation. The inclusion of electron inertia in the model allows us to obtain the value of the plasma floating potential as resulting from an electron density discontinuity at the walls, where the electrons attain sound velocity and the electric potential is continuous. Results from numerical computation are presented in terms of plots for densities, electric potential and particles velocities. Comparison with results from literature, corresponding to electron Maxwell-Boltzmann distribution (neglecting electron inertia), are also shown.

[P269-2014] "On Correction Factor in Scaling Law for Low Pressure DC Gas Breakdown"

Ronchi, G.*; Machida, M.*; IOP(Ed.)

The low pressure gas breakdown described by Paschen's law in Townsend theory, i.e. the breakdown voltage as a function of gas pressure p and the electrode distance d, provides an accurate description of breakdown in DC discharges when the ratio between inter-electrode gap distance d and electrode radii R tends to zero. On increasing of the ratio d/R, the Paschen's curves are shifted to the region of higher breakdown voltage and higher pd values. A modified Paschen's law recently proposed is well satisfied in our measurements. However, the value of constant b changes not only due to gas type but also according to electrode gap distance; furthermore, gas breakdown voltages are considerably modified by plasma-wall interactions due to glass tube proximity in the discharge.

[P270-2014] "Performance of a new atomistic geometrical model of the B-DNA configuration for DNA-radiation interaction simulations"

Bernal, M. A.*; Sikansi, D.*; Cavalcante, F.*; Incerti, S.; Champion, C.; Ivanchenko, V.; Francis, Z.; Karamitros, M.; Vagenas, E. C. (Ed.); Vlachos, D. S. (Ed.)

We have recently developed an atomistic model of the B-DNA configuration, up to the 30-nm chromatin fiber. This model is intended to be used in Monte Carlo simulations of the DNA-radiation interaction, specifically in conjunction with the Geant4-DNA extension of the Geant4 Monte Carlo toolkit. In this work, 11449 parallel chromatin fibers have been arranged within a cube mimicking a cell nucleus containing about $6.5 \times 10(9)$ base pairs. Each atom in the model is represented by a sphere with the corresponding van der Waals radius. Direct single, double and total DNA strand break yields due to the impact of protons and alpha particles with LET ranging from 4.57 to 207.1 keV/mu m have been determined. Also, the corresponding site-hit probabilities have been calculated.

[P271-2014] "Rare Earth Luminescence in Nanostructured Amorphous Silicon Alloys"

Tessler, L. R.*; Mascher P.(Ed.); Lockwood D. J.(Ed.)

Rare Earth (RE) doped amorphous silicon alloys can be prepared by reactive RF sputtering from a Si target partially covered with metallic or oxide RE platelets using appropriate reactive atmospheres. We have studied Er3+, Nd3+, Eu3+ and Tb3+ in a-Si:H, a-SiOx:H and a-SiNx:H. Annealing optimizes the photoluminescence and can induce the formation of Si nanocrystals. The RE act as nucleation centers. The RE ions present intense photoluminescence at room temperature. EXAFS measurements reveal a highly non-centrosymetric lattice site for Er in a-SiOx:H. This partially breaks the selection rule that forbids intra-4f transitions. The RE present two luminescence lifetimes, the fast component determined by the host and the slow component associated to the local symmetry of the ions. The amorphous and nanostructured hosts increase the cross section for RE excitation by a few orders of magnitude, making the materials practical for applications as phosphors and active amplifiers.

[P272-2014] "Tb3+ Luminescence in a-SiNx:H"

Bosco, G. B. F.*; Tessler, L. R.*; Mascher P.(Ed.); Lockwood D. J.(Ed.)

Terbium doped hydrogenated amorphous silicon nitride was prepared by reactive RF-sputtering from a silicon target partially covered either with Tb4O7 or metallic Tb platelets in a Ar+N-2+H-2 atmosphere. When the samples have a high enough bandgap they present characteristic Tb3+ luminescence. The luminescence intensity depends on the annealing temperature. For a given smaple, the luminescence intensity under non-resonant excitation is 10 to 20 times smaller than under resonant excitation of Tb3+. The luminescence intensity under resonant excitation slightly increases with temperature, while under non-resonant excitation it decreases with temperature.. These results are interpreted as due to very effective intra-4f radiative recombination processes in Tb3+ in a-SiNx:H. However, the excitation transfer from the matrix is inefficient or our samples are not yet fully optimized for it.

Livro Publicado

[L002-2014] "An Introduction to Macroscopic Quantum Phenomena and Quantum Dissipation"

Caldeira, A. O.*

*Autores da comunidade IFGW

Defesas de Dissertações

[D008-2014] "Nanomembranas Tensionadas: Ilhas de InAs em Substratos Complacentes de Si e Microtubos Metálicos Enrolados como um Sensor SERS para Monocamadas Auto Organizadas"
Aluno: Leandro das Mercês Silva
Data: 17/07/2014

[D009-2014] "Deposição e caracterização físico-química de filmes finos nanoestruturados (nanocompósitos) contendo Ti,C,N e O obtidos a partir de um precursor líquido (Ti(OC2H5)4)"
Aluno: Vinícius Gabriel Antunes
Data: 30/07/2014

[D010-2014] "Descrição Variacional de Sistemas Formados por átomos de 4He"
Aluno: Vinícius Zampronio Pedroso
Orientador: Prof. Dr. Silvio Antonio S. Vitiello
Data: 07/08/2014

[D011-2014] "Determinação Estrutural de Grafeno sobre Irídio (111) por Difração de Fotoelétrons"
Aluno: Caio César Silva
Orientador: Prof. Dr. Abner de Siervo
Data: 11/08/2014

[D012-2014] "Tailoring Nanostructures of Tetraphenyl Porphyrins and Phthalocyanines on Metallic Surfaces"
Aluno: Shadi Passam Fatayer
Orientador: Prof. Dr. Abner de Siervo
Data: 18/08/2014

[D013-2014] "Acoplamento em estruturas híbridas: Poço e Pontos Quânticos"
Aluno: Graciely Elias dos Santos
Orientador: Profa. Dra. Maria José Santos Pompeu Brasil
Data: 29/08/2014

[D014-2014] "Utilização do detector CR-39 de Diferentes Tamanhos para a Detecção de Filhos do Radônio em Ambientes com Baixa Ventilação"
Aluno: Lucas Antoniassi Pereira
Data: 05/09/2014

Defesas de Teses

[T016] "Procura de indícios de neutrinos estéreis nos experimentos IceCube e KATRIN"
Aluno: Victor Saul Basto Gonzalez
Orientador: Prof. Dr. Orlando Luis Goulart Peres
Data: 28/07/2014

[T017] "Estudo de vórtice magnético em nanopartículas para aplicações em hipertermia magnética"
Aluno: Carlos Sato Baraldi Dias
Orientador: Prof. Dr. Flavio Garcia
Data: 08/08/2014

[T018] "Estudo de propriedades magnéticas e de transporte em novos materiais"
Aluno: Thales Macedo Garitezi
Orientador: Prof. Dr. Pascoal J. G. Pagliuso
Data: 14/08/2014

[T019] "Diagnóstico e modelagem de plasmas micro-ondas e aplicações"
Aluno: Marco Antonio Ridenti
Orientador: Prof. Dr. Jayr de Amorim Filho
Data: 20/08/2014

[T020] "Procurando por assinaturas do campo magnético cósmico usando wavelets"
Aluno: Marcelo Zimbres Silva
Orientador: Prof. Dr. Ernesto Kemp
Data: 29/08/2014

[T021] "Estudo teórico de sistema de elétrons altamente correlacionados"
Aluno: Cesar José Calderon Filho
Orientador: Prof. Dr. Gaston Eduardo Barberis
Data: 15/08/2014

Fonte: Portal IFGW/Pós-graduação - Agenda de Colóquios, Defesas e Seminários.
Disponível em: http://portal.ifi.unicamp.br/pos-graduacao

Patentes

[Pa001-2014] "Reator de reforma autotérmica de etanol"
Ennio Peres da Silva*; et al.
Número da Patente ou Registro: (Agência INOVA) PI0504349-2
Tipo da Patente: de Invenção
Mês/Ano de Conclusão:03/2014 - INPI/BBRASIL

[Pa002-2014] "Esquipamento de Fluortescência de uma molécula só e seu uso"
Rene Afonso; Juliano Grigoleto Hayashi; **Cristiano Monteiro de Barros Cordeiro*;** Teresa Dib Zambon Atvars; Amanda Ferreira Costa
Número da Patente ou Registro: (Agência INOVA) BR 10 2014 009246 3
Tipo da Patente: de Invenção
Mês/Ano de Conclusão:04/2014 - INPI/BBRASIL

[Pa003-2014] "Processo de produção de tubos, capilares e bastões de vidro telurito"
Luiz Carlos Barbosa*; Carlos Henrique de Brito Cruz*; Carlos Lenz Cesar*; Cristiano Monteiro de Barros Coelho*; Enver Fernández Chillcce
Número da Patente ou Registro: (Agência INOVA) PI0502659-8
Tipo da Patente: de Invenção
Mês/Ano de Conclusão:05/2014 - INPI/BBRASIL

Fonte: SIPEX – Sistema de Informação e Pesquisa e Extensão da Unicamp.
Disponível em: http://www.unicamp.br/sipex/#

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