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Trabalhos Publicados

[P151-11] "Absorption effects in electron-sulfur-dioxide collisions"

Machado, L. E., Sugohara, R. T., dos Santos, A. S., Lee, M. T., Iga, I., de Souza, G. L. C., Homem, M. G. P., Michelin, S. E., and Brescansin, L. M.

A joint experimental-theoretical study on electron-SO(2) collisions in the low and intermediate energy range is reported. More specifically, experimental elastic differential, integral, and momentum transfer cross sections in absolute scale are measured in the 100-1000 eV energy range using the relative-flow technique. Calculated elastic differential, integral, and momentum transfer cross sections as well as grand-total and total absorption cross sections are also presented in the 1-1000 eV energy range. A complex optical potential is used to represent the electron-molecule interaction dynamics, whereas the Schwinger variational iterative method combined with the distorted-wave approximation is used to solve the scattering equations. Comparison of the present results is made with the theoretical and experimental results available in the literature

Physical Review A 84[3]. 032709. 2011.

[P152-11] "Aerobic oxidation of monoterpenic alcohols catalyzed by ruthenium hydroxide supported on silica-coated magnetic nanoparticles"

Costa, V. V., Jacinto, M. J., Rossi, L. M., Landers, R., and Gusevskaya, E. V.

Ruthenium hydroxide supported on silica-coated magnetic nanoparticles was shown to be an efficient heterogeneous catalyst for the liquid-phase oxidation of a wide range of alcohols using molecular oxygen as a sole oxidant in the absence of co-catalysts or additives. The material was prepared through the loading of the amino modified support with ruthenium(III) ions from an aqueous solution of ruthenium(III) chloride followed by treatment with sodium hydroxide to form ruthenium hydroxide species. Characterizations suggest that ruthenium hydroxide is highly dispersed on the support surface, with no ruthenium containing crystalline phases being detected. Various carbonylic monoterpenoids important for fragrance and pharmaceutical industries can be obtained in good to excellent yields starting from biomass-based monoterpenic alcohols, such as isobomeol, perillyl alcohol, carveol, and citronellol. The catalyst undergoes no metal leaching and can be easily recovered by the application of an external magnet and re-used. (C) 2011 Elsevier Inc. All rights reserved

Journal of Catalysis 282[1], 209-214. 2011.

[P153-11] "Aluminium-magadiite: from crystallization studies to a multifunctional material"

Moura, H. M., Bonk, F. A., Vinhas, R. C. G., Landers, R., and Pastore, H. O.

The synthesis of [Al]-magadiite (Si/Al 15) was monitored during preparation and crystallization by the Aluminium-Induced Crystallization method developed previously (G. B. Superti, E. C. Oliveira, H. O. Pastore, G. Gatti and L. Marchese, Chem. Mater., 2007, 19, 4300-4315.). For monitoring purposes samples were collected at 0, 12 and 24 h and after aluminium introduction at 0, 6 and 12 h of hydrothermal treatment. A systematic study of the physicochemical and thermal properties of the products obtained at each step in [Al]-magadiite synthesis was performed by combining different experimental techniques [infrared spectroscopy (FTIR), X-ray diffraction (XRD), thermogravimetric analysis (TGA) and solid-state magic-angle spinning nuclear magnetic resonance (MAS-NMR)]. (27)Al MAS NMR confirmed the insertion of Al ions into the magadiite framework in tetrahedral positions. The results obtained showed that the hydrothermal treatment before aluminium insertion served essentially for the creation of magadiite seeds. Thus, induced crystallization by introduction of magadiite seeds directly in the synthesis gel showed that the synthesis duration could be reduced and variable Si/Al ratios showed that the increase in aluminium concentration affects the crystallinity of the material and allows us to obtain [Al]-magadiite with different Si/Al ratios in a single step. Different Al(td) nonequivalent sites were detected by 3QMAS-NMR experiment. X-Ray photoelectron spectroscopy (XPS) allowed designing the [Al]-magadiite structure as a pure silicon magadiite core with a thin layer of aluminosilicate deposited on top of it

Crystengcomm 13[17], 5428-5438. 2011.

[P154-11] "Anisotropy of track revelation in epidote: Results of a step etching experiment with (86)Kr ion tracks"

Curvo, E. A. C., Guedes, S., Alencar, I., Nakasuga, W. M., Tello, C. A., Iunes, P. J., and Hadler, J. C.

Epidote etching anisotropy has been studied through step etching of (86)Kr (300 MeV) ion tracks. A slice of epidote natural monocrystal was taken from the (010) plane and then divided into five pieces. Each piece was then irradiated with ions whose incidence angles (zenith angles) were of 15 degrees, 30 degrees, 45 degrees, 60 degrees and 75 degrees with respect to y-axis. The azimuthal angle of incidence of the ions was the same for the pieces 15 degrees, 60 degrees, 75 degrees and 180 degrees apart for the pieces 30 degrees and 45 degrees. Etching times were of 10, 20, 30, 40 and 50 min (HF 40%, 35 degrees C). The results show that etching velocities of ion tracks are higher in directions closer to the y-axis. The mean lengths of the ion tracks, regarding the angles, were of 23.14 +/- 0.21 (15 degrees); 19.89 +/- 0.08 (30 degrees); 19.39 +/- 0.04 (45 degrees) and 16.59 +/- 0.10 mu m (60 degrees). Since no tracks were identified in the 75 degrees aliquot it was assumed that the epidote has a critical angle, for recording of ion tracks with this mass/energy ratio, between 60 degrees and 75 degrees. (C) 2011 Elsevier Ltd. All rights reserved

Radiation Measurements 46[8], 722-725. 2011.

[P155-11] "Applicability of A Representation for the Martin'S Real-Part Formula in Model-Independent Analyses"

Fagundes, D. A. and Menon, M. J.

Using a novel representation for the Martin's real-part formula without the full scaling property, an almost model-independent description of the proton proton differential cross-section data at high energies (19.4 GeV-62.5 GeV) is obtained. In the impact parameter and eikonal frameworks, the extracted inelastic overlap function presents a peripheral effect (tail) above 2 fin and the extracted opacity function is characterized by a zero (change of sign) in the momentum transfer space, confirming results from previous model-independent analyses. Analytical parametrization for these empirical results are introduced and discussed. The importance of investigations on the inverse problems in high-energy elastic hadron scattering is stressed and the relevance of the proposed representation is commented. A short critical review on the use of Martin's formula is also presented

International Journal of Modern Physics A 26[19], 3219-3247. 2011.

[P156-11] "Application of amorphous carbon based materials as antireflective coatings on crystalline silicon solar cells"

da Silva, D. S., Cortes, A. D. S., Oliveira, M. H., Motta, E. F., Viana, G. A., Mei, P. R., and Marques, F. C.

We report on the investigation of the potential application of different forms of amorphous carbon (a-C and a-C:H) as an antireflective coating for crystalline silicon solar cells. Polymeric-like carbon (PLC) and hydrogenated diamond-like carbon films were deposited by plasma enhanced chemical vapor deposition. Tetrahedral amorphous carbon (ta-C) was deposited by the filtered cathodic vacuum arc technique. Those three different amorphous carbon structures were individually applied as single antireflective coatings on conventional (polished and texturized) p-n junction crystalline silicon solar cells. Due to their optical properties, good results were also obtained for double-layer antireflective coatings based on PLC or ta-C films combined with different materials. The results are compared with a conventional tin dioxide (SnO_2) single-layer antireflective coating and zinc sulfide/magnesium fluoride (ZnS/MgF_2) double-layer antireflective coatings. An increase of 23.7% in the short-circuit current density, $J(sc)$, was obtained using PLC as an antireflective coating and 31.7% was achieved using a double-layer of PLC with a layer of magnesium fluoride (MgF_2). An additional increase of 10.8% was obtained in texturized silicon, representing a total increase (texturization + double-layer) of about 40% in the short-circuit current density. The potential use of these materials are critically addressed considering their refractive index, optical bandgap, absorption coefficient, hardness, chemical inertness, and mechanical stability. (C) 2011 American Institute of Physics. [doi:10.1063/1.3622515]

[P157-11] "Effect of Gd(3+) doping on magnetic, electric and dielectric properties of MgGd(x)Fe(2-x)O(4) ferrites processed by solid state reaction technique"

Chand, J., Kumar, G., Kumar, P., Sharma, S. K., Knobel, M., and Singh, M.

$MgGd(x)Fe(2-x)O(4)$ ($x = 0.0, 0.05, 0.1$ and 0.15) ferrites, with improved dc resistivity, initial permeability, saturation magnetization, and extremely low relative loss factor, have been synthesized by solid state reaction technique. The microstructures, electric, dielectric and magnetic properties have been investigated by means of X-ray diffraction, Keithley 2611 system, impedance analyzer and VSM respectively. The addition of Gadolinium in Mg ferrite has been shown to play a crucial role in enhancing the electric, dielectric and magnetic properties. The dc resistivity is increased by two orders of magnitude as compared to Mg ferrite. Saturation magnetization has been increased by two times and remnant magnetization has been increased by more than three times due to the doping of Gd(3+) ions in Mg ferrite. The relative loss factor was found to have very low values and is of the order of 10(-4)-10(-5) in the frequency range 0.1-30 MHz. The variations of electric, dielectric and magnetic properties of the samples have been studied as a function of frequency and Gd(3+) ions concentration measured at room temperature. High resistivity and improved magnetic properties can be correlated with better compositional stoichiometry and the replacement of Fe(3+) ions by Gd(3+) ions. The mechanisms responsible to these results have been discussed in this paper. (C) 2011 Elsevier B.V. All rights reserved

[P158-11] "Effects of applied electric and magnetic fields on a donor impurity in laterally coupled quantum dots"

Ulloa, P., Pacheco, M., Barticevic, Z., and Oliveira, L. E.

A theoretical description of the electronic structure, optical spectrum and binding energy of a hydrogenic impurity in laterally coupled quantum discs, under applied electric and magnetic fields, is given within the framework of the effective-mass approach. Calculations are performed using the envelope-function formalism and a variational procedure, with the electric field applied in the coupling direction, the magnetic field along the growth direction, and the impurity at the center of the heterostructure. The results indicate that the anisotropy of the laterally coupled confinement potential leads to interesting relative extrema and anticrossings in the energy spectra, and that the infrared absorption spectrum is sensitive to the type of polarization and magnitude of external fields

[P159-11] "Electronic depiction of magnetic origin in undoped and Fe doped TiO(2-d) epitaxial thin films"

Bapna, K., Choudhary, R. J., Pandey, S. K., Phase, D. M., Sharma, S. K., and Knobel, M.

We have investigated the electronic and magnetic properties of the pulsed laser deposited epitaxial thin films of undoped and Fe doped (4 at. %) anatase TiO(2-d) by photoemission, magnetization measurements, and ab-initio band structure calculations. These films show room temperature magnetic ordering. It is observed that Fe ions hybridize with the oxygen vacancy induced Ti(3+) defect states. Our study reveals the formation of local magnetic moment at Ti and Fe sites to be responsible for magnetic ordering. A finite density of states at the Fermi level in both undoped and Fe doped films is also observed, suggesting their degenerate semiconducting nature. (C) 2011 American Institute of Physics. [doi: 10.1063/1.3640212]

[P160-11] "Emotional Face Perception in Healthy Subjects and Parkinson's Disease: An Effective Connectivity Study"

da Silva, E. L., Castellano, G., Sato, J. R., Cardoso, E. F., and Amaro, E.

We investigated the neural connectivity induced by face presentation with different emotional valences in Parkinson's disease (PD) patients and a control group of healthy, drug-free volunteers, using event-related fMRI in a parametric design. The focus of this work was applying Dynamic Causal Modelling (DCM), an approach that allows the assessment of effective connectivity within cortical networks [1], to the study of effective connectivity between maximally activated brain regions in response to passive viewing of facial stimuli. A connectivity model was built based on the literature and in our fMRI analyses, which included the fusiform gyrus (FG), the anterior cingulate cortex (ACG), the dorsolateral prefrontal cortex (DLPFC) and the dorso-medial prefrontal cortex (DMPFC) areas. The results showed differences in connectivity between the PD group and the control group. We found that the intrinsic connectivities among DLPFC/DMPFC and FG, DLPFC/DMPFC and ACG, were higher in PD patients than in healthy subjects, while the effective connectivity among FG and ACG was lower in PD patients

[P161-11] "Eu(2+) spin dynamics in the filled skutterudites EuM(4)Sb(12) (M = Fe, Ru, Os)"

Garcia, F. A., Adriano, C., Cabrera, G. G., Holanda, L. M., Pagliuso, P. G., Avila, M. A., Oseroff, S. B., and Rettori, C.

We report evidence for a close relation between the thermal activation of the rattling motion of the filler guest atoms and inhomogeneous spin dynamics of the Eu(2+) spins. The spin dynamics is probed directly by means of Eu(2+) electron spin resonance (ESR), performed in both X-band (approximate to 9.4 GHz) and Q-band (approximate to 34 GHz) frequencies in the temperature interval 4.2 K less than or similar to T less than or similar to 300 K. A comparative study with ESR measurements on the beta-Eu(8)Ga(16)Ge(30) clathrate compound is presented.

Our results point to a correlation between the rattling motion and the spin dynamics which may be relevant for the general understanding of the dynamics of cage systems

[P162-11] "Evidence of existence of metastable SrFe(12)O(19) nanoparticles"

Garcia, R. M., Bilovol, V., Socolovsky, L. M., and Pirota, K.

The existence of metastable hexaferrite is reported. Synthesis of strontium hexaferrite, SrFe(12)O(15), at 400 degrees C was realized under controlled oxygen atmosphere. Such technique allows obtaining of SrFe(12)O(15) at lower temperatures than those by traditional methods (above 800 degrees C). Phase transformation occurred during a measurement of magnetization vs. temperature (heating up to 625 degrees C). The heat treatment induces a change from SrFe(12)O(15) to gamma-Fe(2)O(3) (as the main phase), and SrFeO(27.4) to Sr(2)Fe(2)O(5). Together with these phase transformations, an increment in the amount of SrCO(3) is detected. Magnetic study of the samples, before and after the heating, supports the structural analysis conclusions.

[P163-11] "Fermi Acceleration in driven relativistic billiards"

Pinto, R. S. and Letelier, P. S.

We show numerical experiments of driven billiards using special relativity. We have the remarkable fact that for the relativistic driven circular and annular concentric billiards, depending on initial conditions and parameters, we observe Fermi Acceleration, absent in the Newtonian case. The velocity for these cases tends to the speed of light very quickly. We find that for the annular eccentric billiard the initial velocity grows for a much longer time than the concentric annular billiard until it asymptotically reach c.

[P164-11] "Ferroic investigations in LuFe(2)O(4) multiferroic ceramics"

Viana, D. S. F., Gotardo, R. A. M., Cotica, L. F., Santos, I. A., Olzon-Dionysio, M., Souza, S. D., Garcia, D., Eiras, J. A., and Coelho, A. A.

In this paper, the ferroic properties of polycrystalline LuFe(2)O(4) samples were carefully investigated, and a dissimilar charge ordered state was identified. Strong dielectric dispersion, between 350 K and 225 K; the formation of cluster glass magnetic phases in the same temperature range; and the existence of a ferrimagnetic transition at 230 K indicate the coupling between the ferroelectric and the magnetic orders. Mossbauer spectroscopic investigations, at room temperature, revealed unbalanced contributions of the ferric and ferrous iron ions to the charge ordered state. [doi:10.1063/1.3622147]

[P165-11] "Implementation of a two-qubit controlled-rotation gate based on unconventional geometric phase with a constant gating time"

Yabu-Uti, B. F. C. and Roversi, J. A.

We propose an alternative scheme to implement a two-qubit controlled-R (rotation) gate in the hybrid atom-CCA (coupled cavities array) system. Our scheme results in a constant gating time and, with an adjustable qubit-bus coupling (atom-resonator), believe that this proposal may open promising perspectives for networking quantum information processors and implementing distributed and scalable quantum computation.

[P166-11] "Investigations of lanthanum doping on magnetic properties of nano cobalt ferrites"

Kumar, P., Sharma, S. K., Knobel, M., Chand, J., and Singh, M.

The magnetic properties of nano-crystallite cobalt lanthanum ferrite (CoLa(x)Fe(2-x) O(4)) with varied quantities of lanthanum (x = 0, 0.1, 0.15, 0.2, 0.25, 0.3) prepared by co-precipitation method have been studied by vibrating sample magnetometer (VSM) and LCR meter. X-ray diffraction (XRD) and transmission electron microscopy (TEM) confirmed the size, structure, and morphology of the ferrite samples. The average crystallite size varied from 17.83 nm to 49.99 nm. All the samples, although, in nano range, show significant hysteresis. The saturation magnetization (M(s)) values decreased from 60.57 emu/g to 30.15 emu/g. The remanence (M(R)) fell from 10.85 emu/g to 6.39 emu/g. Doping with lanthanum La(3+) ions modulates significantly the magnetic properties of cobalt spinel ferrites without sacrificing the ferromagnetic character

[P167-11] "K*(0) production in Cu plus Cu and Au plus Au collisions at root s(NN)=62.4 GeV and 200 GeV"

Aggarwal, M. M., Ahammed, Z., Alakhverdyants, A. V., Alekseev, I., Alford, J., Anderson, B. D., Anson, C. D., Arkhipkin, D., Averichev, G. S., Balewski, J., Barnby, L. S., Baumgart, S., Beavis, D. R., Bellwied, R., Betancourt, M. J.,et all

We report on K*(0) production at midrapidity in Au + Au and Cu + Cu collisions at root s(NN) = 62.4 and 200 GeV collected by the Solenoid Tracker at the Relativistic Heavy Ion Collider detector. The K*(0) is reconstructed via the hadronic decays K*(0) -> K(+) pi(-) and (K*(0)) over bar -> K(+)pi(-). Transverse momentum, p(T), spectra are measured over a range of p(T) extending from 0.2 GeV/c up to 5 GeV/c. The center-of-mass energy and system size dependence of the rapidity density, dN/dy, and the average transverse momentum, < p(T)>, are presented. The measured N(K*(0))/N(K) and N(phi)/N(K*(0)) ratios favor the dominance of rescattering of decay daughters of K*(0) over the hadronic regeneration for the K*(0) production. In the intermediate p(T) region (2.0 < p(T) < 4.0 GeV/c), the elliptic flow parameter, v(2), and the nuclear modification factor, R(CP), agree with the expectations from the quark coalescence model of particle production

[P168-11] "Moran model as a dynamical process on networks and its implications for neutral speciation"

de Aguiar, M. A. M. and Bar-Yam, Y.

In population genetics, the Moran model describes the neutral evolution of a biallelic gene in a population of haploid individuals subjected to mutations. We show in this paper that this model can be mapped into an influence dynamical process on networks subjected to external influences. The panmictic case considered by Moran corresponds to fully connected networks and can be completely solved in terms of hypergeometric functions. Other types of networks correspond to structured populations, for which approximate solutions are also available. This approach to the classic Moran model leads to a relation between regular networks based on spatial grids and the mechanism of isolation by distance. We discuss the consequences of this connection for topopatric speciation and the theory of neutral speciation and

biodiversity. We show that the effect of mutations in structured populations, where individuals can mate only with neighbors, is greatly enhanced with respect to the panmictic case. If mating is further constrained by genetic proximity between individuals, a balance of opposing tendencies takes place: increasing diversity promoted by enhanced effective mutations versus decreasing diversity promoted by similarity between mates. Resolution of large enough opposing tendencies occurs through speciation via pattern formation. We derive an explicit expression that indicates when speciation is possible involving the parameters characterizing the population. We also show that the time to speciation is greatly reduced in comparison with the panmictic case

Physical Review e 84[3]. 031901. 2011.

[P169-11] "Multi-flux tube initial condition and event-by-event hydrodynamics"

Mota, P., Kodama, T., Koide, T., and Takahashi, J.

We investigate the event by event fluctuation using hydrodynamic approach with the initial condition formed by an ensemble of tubes. generating inhomogeneities in the energy profile. Using a 2D modeling, we observe emergence of double peaked structure in the away side two particle azimuthal correlation considering various scenarios

Nuclear Physics A 862-63, 188-191. 2011.

[P170-11] "Multimodal nonlinear optical microscopy used to discriminate epithelial ovarian cancer"

Adur, J., Pelegati, V. B., de Thomaz, A. A., Almeida, D. B., Bottcher-Luiz, F., Andrade, L. A. L. A., and Cesar, C. L.

We used human specimens of epithelial ovarian cancer (serous type) to test the feasibility of nonlinear imaging as complementary tools for ovarian cancer diagnosis. Classical hematoxylin-and-eosin stained sections were applied to combining two-photon excitation fluorescence (TPEF), second (SHG), and third (THG) harmonic microscopy within the same imaging platform. We show that strong TPEF + SHG + THG signals can be obtained in fixed samples stained with Hematoxylin & Eosin (H&E) stored for a very long time and that H&E staining enhanced the THG signal. We demonstrate using anisotropy and morphological measurements, that SHG and THG of stained optical sections allow reproducible identification of neoplastic features such as architectural alterations of collagen fibrils at different stages of the neoplastic transformation and cellular atypia. Taken together, these results suggest that, with our viable imaging system, we can qualitatively and quantitatively assess endogenous optical biomarkers of the ovarian tissue with SHG and THG microscopy. This imaging capability may prove to be highly valuable in aiding to determine structural changes at the cellular and tissue levels, which may contribute to the development of new diagnostic techniques

Advanced Microscopy Techniques Ii 8086. 2011.

[P171-11] "Multimode Vibrational Couplings in Resonant Positron Annihilation"

Sanchez, S. D., Lima, M. A. P., and Varella, M. T. D.

The mechanisms for multimode vibrational couplings in resonant positron annihilation are not well understood. We show that these resonances can arise from positron-induced distortions of the potential energy surface (target response to the positron field). Though these distortions can transfer energy into single- and multiquantum vibrations, they have so far been disregarded as a pathway to resonant annihilation. We also compare the existing annihilation theories and show that the currently accepted model can be cast as a special case of the Feshbach annihilation theory

Physical Review Letters 107[10]. 103201. 2011.

[P172-11] "Nanoscale lateral switchable rectifiers fabricated by local anodic oxidation

Siles, P. F., Archanjo, B. S., Baptista, D. L., Pimentel, V. L., Yang, J. J., Neves, B. R. A., and Medeiros-Ribeiro, G.

Scanning probe lithography as a mean to pattern, implement, and discover new devices in different materials systems provides an elevated degree of flexibility, permitting one to tailor device geometries and structures at will, in particular by virtue of modification of the local chemistry. Here we define metal-insulator-metal junctions exhibiting a switchable rectifier behavior by patterning titanium channels through local anodic oxidation techniques. The nanoscale TiO_2 junctions thus formed exhibit IV characteristics with non-volatile switchable rectification and memristive behavior due to ionic motion through the metal-semiconductor interfaces. VC 2011 American Institute of Physics. [doi:10.1063/1.3609065]

Journal of Applied Physics 110[2]. 024511. 2011.

[P173-11] "Phase transitions and spatially-ordered counterion association in ionic-lipid bilayers: a statistical model"

Tamashiro, M. N., Germano, R., Lamy, M. T., and Henriques, V. B.

European Biophysics Journal with Biophysics Letters 40, 197. 2011.

[P174-11] "Polarized and resonant Raman spectroscopy on single InAs nanowires"

Moller, M., de Lima, M. M., Cantarero, A., Dacal, L. C. O., Madureira, J. R., Iikawa, F., Chiaramonte, T., and Cotta, M. A.

We report polarized Raman scattering and resonant Raman scattering studies on single InAs nanowires. Polarized Raman experiments show that the highest scattering intensity is obtained when both the incident and analyzed light polarizations are perpendicular to the nanowire axis. InAs wurtzite optical modes are observed. The obtained wurtzite modes are consistent with the selection rules and also with the results of calculations using an extended rigid-ion model. Additional resonant Raman scattering experiments reveal a redshifted E(1) transition for InAs nanowires compared to the bulk zinc-blende InAs transition due to the dominance of the wurtzite phase in the nanowires. Ab initio calculations of the electronic band structure for wurtzite and zinc-blende InAs phases corroborate the observed values for the E(1) transitions

Physical Review B 84[8]. 085318. 2011.

[P175-11] "Probing new limits for the Violation of the Equivalence Principle in the solar-reactor neutrino sector as a next to leading order effect"

Valdiviesso, G. A., Guzzo, M. M., and Holanda, P. C.

New limits for the Violation of the Equivalence Principle (VEP) are obtained considering the mass-flavor mixing hypothesis. This analysis includes observations of solar and reactor neutrinos and has obtained a limit for the VEP parameter vertical bar Delta gamma vertical bar contributing to the nu(e) and (nu) over bar (e) disappearance channels of the order vertical bar Delta gamma vertical bar < 10(-14), when it is assumed that neutrinos are

mainly affected by the gravitational potential phi approximate to 10(-5) due to the Great Attractor. (C) 2011 Elsevier B.V. All rights reserved

[P176-11] "Single camera 3D"

Lunazzi, J. J.

A simple system to make stereo photography or videos based in just two mirrors was made in 1988 and recently adapted to a digital camera setup. Possibilities in the use of computer software to make anaglyphic stereo are also reported

[P177-11] "Study of the Factors Responsible for the Rheology Change of a Brazilian Crude Oil under Magnetic Fields"

Goncalves, J. L., Bombard, A. J. F., Soares, D. A. W., Carvalho, R. D. M., Nascimento, A., Silva, M. R., Alcantara, G. B., Pelegrini, F., Vieira, E. D., Pirota, K. R., Bueno, M. I. M. S., Lucas, G. M. S., and Rocha, N. O.

Recently, some works showed that magnetic fields may reduce the paraffin crystallization and the viscosity of some types of oil. This Article shows the main results obtained in an attempt to determine some factors responsible for the oil interaction with magnetic fields, which caused the rheological properties change in crude oil samples. Under the influence of a magnetic field (1.3 Tin 1 min exposure), one of the six brazilian crude oil samples studied (sample 1) showed 39% reduction on its viscosity and a reduction on the viscoelastic properties (loss modulus and storage modulus). However, the other five samples did not show any considerable modification of their rheological properties. We analyzed all six samples using spectroscopy to detect what kind of component was present in sample 1 that could interact with the magnetic field and cause the aforementioned rheological properties change and that was not present in the other samples. The major differences observed in sample 1 were the presence of the Mn(2+) paramagnetic ion (EPR spectroscopy); Sr and Br (XRF spectroscopy); highest aromatic/aliphatic molecules ratio (NMR spectroscopy); and the highest water content (10% v/v, NMR spectroscopy). Thus, the results show that the paraffin could not be the unique factor responsible for the change on the theological properties of the crude oil samples caused by magnetic fields, as some authors suggested previously

[P178-11] Surface structure determination of Pd on W(100) using X-ray photoelectron diffraction

F.C. Lussani, A. de Siervo, J.J.S. de Figueiredo , A. Pancotti, R. Landers

Ferromagnetic ordering in non-ferromagnetic transition metals induced by structural effects such as lattice expansion and stacking faults have been predicted by several theoretical studies. Different surfaces such as Nb(100), W(100) and C(0001) have been suggested as potential templates which could drive a Pd ultrathin film to a stable ferromagnetic state, depending on growth packing, film thickness and lateral lattice parameter. In this work we present an X-ray photoelectron diffraction (XPD) study of sub-monolayer to a few layers of Pd grown on W(100) and its surface structure determination. XPD patterns of Pd 3d and W4f peaks were measured using synchrotron radiation with photon energy of 1810 eV provided by the SXS beamline at the Brazilian Synchrotron Light Laboratory. Our results indicate that the first few monolayers of Pd grow on W(100) with bcc packing and lateral lattice parameter dramatically changed in comparison with the Pd(fcc) bulk values. Based on these results we also present a discussion on the magnetic properties of this system derived from spin-polarized DFT calculation. © 2011 Elsevier B.V. All rights reserved.

[P179-11] "Synthesis and characterization of T[Ni(CN)(4)] center dot 2pyz with T=Fe, Ni, pyz=pyrazine: Formation of T-pyz-Ni bridges"

Lemus-Santana, A. A., Rodriguez-Hernandez, J., Gonzalez, M., Demeshko, S., Avila, M., Knobel, M., and Reguera, E.

The formation of T-pyz-Ni bridges (pyz= pyrazine) in the T[Ni(CN)(4)] center dot 2pyz series is known for T=Mn, Zn, Cd and Co but not with T=Fe, Ni. In this contribution the existence of such bridges also for T=Fe, Ni is discussed. The obtained pillared solids, T[Ni(CN)(4)] center dot 2pyz, were characterized from XRD, TG, UV-Vis, IR, Raman, Mossbauer and magnetic data. Their crystal structures were refined in the orthorhombic Pmna space group from XRD powder patterns. The structural behavior of these solids on cooling down to 77 K was also studied. In the 180-200 K temperature range the occurrence of a structural transition to a monoclinic structure (P2(1)/c space group) was observed. No temperature induced spin transition was observed for Fe[Ni(cN)(4)]. 2pyz. The iron (II) was found to be in high spin electronic state and this configuration is preserved on cooling down to 2 K. The magnetic data indicate the occurrence of a low temperature weak anti-ferromagnetic interaction between T metal centers within the TlNi(CN)(4)] layer. In the paramagnetic region for Ni[Ni(CN)4] center dot 2pyz, a reversible temperature induced spin transition for the inner Ni atom was detected. (C) 2011 Elsevier Inc. All rights reserved

[P180-11] "The modularity of seed dispersal: differences in structure and robustness between bat- and bird-fruit networks"

Mello, M. A. R., Marquitti, F. M. D., Guimaraes, P. R., Kalko, E. K. V., Jordano, P., and de Aguiar, M. A. M.

In networks of plant-animal mutualisms, different animal groups interact preferentially with different plants, thus forming distinct modules responsible for different parts of the service. However, what we currently know about seed dispersal networks is based only on birds. Therefore, we wished to fill this gap by studying bat-fruit networks and testing how they differ from bird-fruit networks. As dietary overlap of Neotropical bats and birds is low, they should form distinct mutualistic modules within local networks. Furthermore, since frugivory evolved only once among Neotropical bats, but several times independently among Neotropical birds, greater dietary overlap is expected among bats, and thus connectance and nestedness should be higher in bat-fruit networks. If bat-fruit networks have higher nestedness and connectance, they should be more robust to extinctions. We analyzed 1 mixed network of both bats and birds and 20 networks that consisted exclusively of either bats (11) or birds (9). As expected, the structure of the mixed network was both modular (M = 0.45) and nested (NODF = 0.31); one module contained only birds and two only bats. In 20 datasets with only one disperser group, bat-fruit networks (NODF = 0.53 +/- A 0.09, C = 0.30 +/- A 0.11) were more nested and had a higher connectance than bird-fruit networks (NODF = 0.42 +/- A 0.07, C = 0.22 +/- A 0.09). Unexpectedly, robustness to extinction of animal species was higher in bird-fruit networks (R = 0.60 +/- A 0.13) than in bat-fruit

networks (R = 0.54 +/- A 0.09), and differences were explained mainly by species richness. These findings suggest that a modular structure also occurs in seed dispersal networks, similar to pollination networks. The higher nestedness and connectance observed in bat-fruit networks compared with bird-fruit networks may be explained by the monophyletic evolution of frugivory in Neotropical bats, among which the diets of specialists seem to have evolved from the pool of fruits consumed by generalists.

Oecologia 167[1], 131-140. 2011.

[P181-11] "Thermally activated exchange narrowing of the Gd(3+) ESR fine structure in a single crystal of Ce(1-x)Gd(x)Fe(4)P(12) (x approximate to 0.001) skutterudite"

Garcia, F. A., Venegas, P. A., Pagliuso, P. G., Rettori, C., Fisk, Z., Schlottmann, P., and Oseroff, S. B.

We report electron spin resonance (ESR) measurements in the Gd(3+) doped semiconducting filled skutterudite compound Ce(1-x)Gd(x)Fe(4)P(12) (x approximate to 0.001). As the temperature T varies from T similar or equal to 150 K to T similar or equal to 165 K, the Gd(3+) ESR fine and hyperfine structures coalesce into a broad inhomogeneous single resonance. At T similar or equal to 200 K the line narrows and as T increases further, the resonance becomes homogeneous with a thermal broadening of 1.1(2) Oe/K. These results suggest that the origin of these features may be associated with a subtle interdependence of thermally activated mechanisms that combine: (i) an increase with T of the density of activated conduction carriers across the T-dependent semiconducting pseudogap; (ii) the Gd(3+) Korringa relaxation process due to an exchange interaction J(fd)S.s between the Gd(3+) localized magnetic moments and the thermally activated conduction carriers; and (iii) a relatively weak confining potential of the rare earth ions inside the oversized (Fe(2)P(3))(4) cage, which allows the rare earths to become rattler Einstein oscillators above T approximate to 148 K. We argue that the rattling of the Gd(3+) ions, via a motional narrowing mechanism, also contributes to the coalescence of the ESR fine and hyperfine structure

Physical Review B 84[12]. 125116. 2011.

[P182-11] "Unfolding of plasmon-polariton modes in one-dimensional layered systems containing anisotropic left-handed materials"

Bruno-Alfonso, A., Reyes-Gomez, E., Cavalcanti, S. B., and Oliveira, L. E.

The propagation of electromagnetic waves through a 1-dimensional layered system containing alternate layers of air and a uniaxial, anisotropic, left-handed material is investigated. . The optical axis of this material is along the stacking direction and the components of the electric permittivity and magnetic permeability tensors that characterize the metamaterial are described by Drude-type responses. Different plasmon frequencies are considered for directions parallel and perpendicular to the optical axis. As in the isotropic case, plasmon polariton modes are found in the neighborhood of the plasmon frequency corresponding to the optical axis. Moreover, it is shown that, depending on the relation between the two plasmon frequencies of the metamaterial, anisotropy leads to the unfolding of an infinite number of nearly dispersionless plasmon-polariton bands either above or below the parallel plasmon frequency.

Physical Review B 84[11]. 113101. 2011.

[P183-11] "[V,Al]-ITQ-6: Novel porous material and the effect of delamination conditions on V sites and their distribution"

de Pietre, M. K., Bonk, F. A., Rettori, C., Garcia, F. A., and Pastore, H. O.

This paper reports on the delamination of the layered [V,Al]-PREFER to originate the [V,Al]-ITQ-6. The swollen material was prepared under alkaline conditions; the delaminated solids were obtained directly from the basic medium after sonication and after acid addition. Vanadium and aluminum atoms are part of the lattice sites as confirmed by (27)Al-MAS-NMR, (51)V-MAS-NMR and UV-Vis spectroscopy. The extent of delamination was monitored by X-ray diffraction, N(2) adsorption-desorption isotherms and (29)Si-MAS-NMR. The presence of bands in the double rings region, as verified by FTIR, shows that in the delaminated materials, the structural unit of the initial lamellar precursor is still preserved. The material obtained after acid addition contains extraframework octahedral V(5+) and V(5+) in a tetrahedral sites, the first ones are easily exchanged by sodium ions. On the opposite, the material prepared only under basic conditions presents only framework tetrahedral V(5+). The presence of the V(4+) was confirmed in the lamellar precursor by EPR but the vanadium oxidation state and localization change throughout the delamination procedure.

Microporous and Mesoporous Materials 145[1-3], 108-117. 2011.

[P184-11] "What Happens in Your Brain When You See An Epileptic Seizure?"

Fernandes, P. T., Silva, E. L., Castellano, G., and Li, L. M.

Epilepsia 52, 238-239. 2011.

Proceedings

[P185-11] "A simple model for the magnetoelectric interaction in multiferroics"

Calderon, C. J. and Barberis, G. E.

The (anti)ferromagnetic and ferroelectric transitions in some multiferroic compounds seem to be strongly correlated. Even for systems that do not show spontaneous ferroelectricity such as the LiMPO(4) (M=Mn, Fe, Co, Ni)compounds, the coupling between magnetic and electric degrees of freedom is evident experimentally. Here, we present a simple numerical calculation to simulate this coupling that leads to the two transitions. We assume a magnetic sublattice consisting of classical magnetic moments coupled to a separated non-magnetic sublattice consisting of classical electric dipoles. The coupling between the mis realized through a phenomenological spin-lattice Hamiltonian, and the solution is obtained using the Monte-Carlo technique. In the simplest version, the magnetic systemis 2D Ising (anti)ferromagnetic lattice, with nearest neighbors interactions only, and the electric moments are permanent moments, coupled electrically. Within this approximation, the second order magnetic transition induces ferroelectricity in the electric dipoles. We show that these calculations can be extended to other magnetic systems,(x-y model and 3D Heisenberg) and to systems where the electric moments are created by strains, generated via spin-lattice coupling, so the model can be applied to model realistic systems such as the olivines mentioned above.

BRISTOL, IOP PUBLISHING LTD. INTERNATIONAL CONFERENCE ON STRONGLY CORRELATED ELECTRON SYSTEMS (SCES 2010) Journal of Physics: Conference Series 273[1]. 012134. 2011.

[P186-11] "La doping effects in the coupling between localized and itinerant electronic states in EuFe(2)As(2) probed by Eu(2+) ESR"

Garcia, F. A., Bittar, E. M., Adriano, C., Garitezi, T. M., Rettori, C., and Pagliuso, P. G

In this work we present an Electron Spin Resonance (ESR) study on La-doped EuFe(2)As(2) aiming to further understand the coupling of localized spin states and itinerant electrons in these systems.

The temperature dependence of the Eu(2+) ESR linewidth, g-value and intensity was investigated for both monocrystalline and powdered samples. Our results confirm the suggestion of previous ESR experiments on the pure compound [1], that the SDW transition dramatically changes the coupling between localized and itinerant states. In addition, we found a peculiar dome like shape in the Eu(2+) ESR line width temperature dependence for temperatures between T(SDW) and T(N).

International Conference on Strongly Correlated Electron Systems (Sces 2010)
Journal of Physics: Conference Series 273[1]. 012093. 2011.

[P187-11] "Transient analysis of thermal distortion in a silicon substrate on incidence of a single soft X-ray FEL pulse"

de Castro, A. R. B., Vasconcellos, A. R., and Luzzi, R.

We discuss the dynamics of a silicon surface after incidence of a short, high energy pulse in the soft X-ray range. We focus on time-delays long enough after pulse incidence, so that the absorbed energy can be seen as a non-uniform time-dependent heat distribution in the solid. A model is developed using techniques of non-equilibrium hydro-thermodynamics, considering just the longitudinal and transverse acoustic phonon systems in the excited solid. The general theory leads to Maxwell-Cattaneo partial differential equations for the material medium n(r,t) and the energy h(r, t) volume densities; these reduce to the diffusion equation for the temperature T(r,t) and the usual thermo-mechanical elastic equation for the strain u(r,t) on further simplification. Here we solve the Maxwell-Cattaneo equation for T(r,t) and compare to previous results where the diffusion equation was used instead; the Maxwell-Cattaneo equation predicts faster cooling at short (dozens of fs, say) time delays. Previously obtained results for the strain field are briefly recalled

Damage to Vuv, Euv, and X-Ray Optics Iii 8077. 80770A .2011.

Artigos Aceitos para Publicação

[A001-11] "Phase Transitions and Spatially Ordered Counterion Association in Ionic-Lipid Membranes: Theory versus Experiment"

V. B. Henriques, R. Germano, M. T. Lamy, and M. N. Tamashiro

Aqueous dispersions of phosphatidylglycerol (PG) lipids may present an anomalous chain-melting transition at low ionic strengths, as seen by different experimental techniques such as calorimetry or light scattering. The anomaly disappears at high ionic strengths or for longer acyl-chain lengths. In this article, we use a statistical model for the bilayer that distinguishes both lipid chain and headgroup states in order to compare model and experimental thermotropic and electrical properties. The effective van der Waals interactions among hydrophobic chains compete with the electrostatic repulsions between polar headgroups,

which may be ionized (counterion dissociated) or electrically neutral (associated with counterions). Electric degrees of freedom introduce new thermotropic charge-ordered phases in which headgroup charges may be spatially ordered, depending on the electrolyte ionic strength, introducing a new rationale for experimental data on PGs. The thermal phases presented by the model for different chain lengths, at fixed ionic strength, compare well with an experimental phase diagram constructed on the basis of differential scanning calorimetry profiles. In the case of dispersions of DMPG dimyristoyl phosphatidylglycerol) with added monovalent salt, the model properties reproduce the main features displayed by data from differential scanning calorimetry as well as the characteristic profile for the degree of ionization of the bilayer surface across the anomalous transition region, obtained from the theoretical interpretation of electrokinetic (conductivity and electrophoretic mobility) measurements.

Langmuir 21, 13130-13143, 2011.

Livro

AGUIAR, Marcus A. M. de. Tópicos de Mecânica Clássica. São Paulo: Livraria da Física, 2011. 250 p. (Coleção tópicos em física; 15).

Resumo:
Apresenta uma abordagem da mecânica clássica direcionada para o estudo da teoria de caos Hamiltoniano e sua conexão com o limite semiclássico da mecânica. Partindo das equações de Newton desenvolve-se inicialmente os formalismos de Lagrange e Hamilton, discutindo com alguma profundidade os métodos variacionais e o teorema de Morse. A teoria de transformações canônicas é então apresentada em detalhe, servindo de base para os métodos perturbativos que permitem o estudo de sistemas integráveis e do aparecimento de caos. O livro é de interesse para alunos de Física e das Engenharias e pode ser usado como texto em um curso de pós-graduação de Mecânica Clássica. Supõe-se que o leitor tenha conhecimentos básicos de mecânica clássica e quântica. Como a maioria dos novos livros didáticos, este foi escrito tendo como base uma série de livros e trabalhos anteriores. Procurou-se, no entanto, apresentar os tópicos de maneira moderna e com linguagem simples.

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