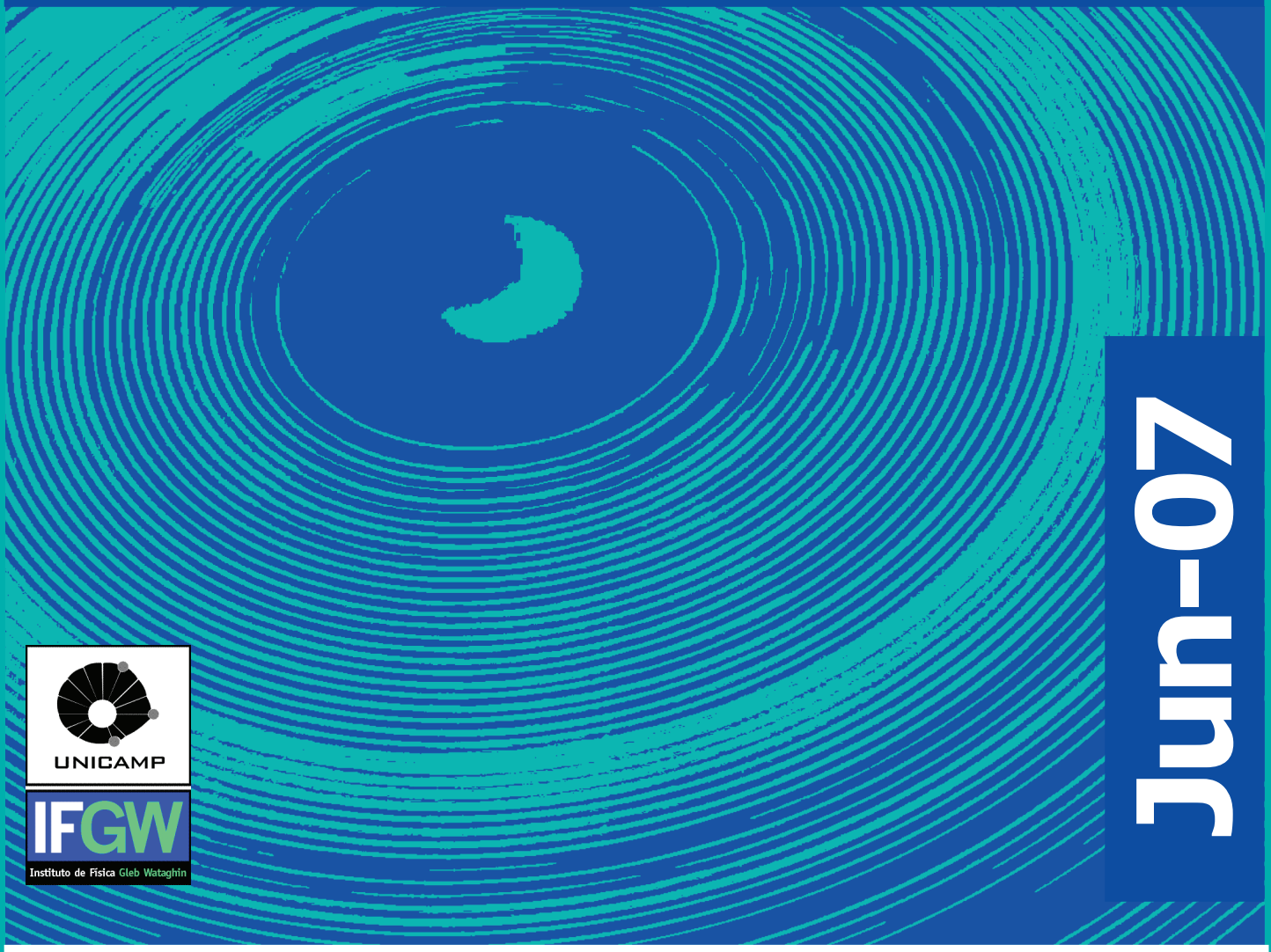
Abstracta

Ano XI - N. 03



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Trabalhos Publicados

Maio 2007 à Junho 2007

P082-07 à P117-07

Trabalhos Publicados

P 082-07 "Alloying mechanisms for epitaxial nanocrystals"

Leite, M. S., Medeiros-Ribeiro, G., Kamins, T. I., and Williams, R. S.

The different mechanisms involved in the alloying of epitaxial nanocrystals are reported in this Letter. Intermixing during growth, surface diffusion, and intraisland diffusion were investigated by varying the growth conditions and annealing environments during chemical vapor deposition. The relative importance of each mechanism was evaluated in determining a particular composition profile for dome-shaped Ge:Si (001) islands. For samples grown at a faster rate, intermixing during growth was reduced. Si surface diffusion dominates during H-2 annealing, whereas Ge surface diffusion and intraisland diffusion prevail during annealing in a PH3 environment.

Physical Review Letters 98[16]. 165901. 2007.

P 083-07 "Chiral oscillations in terms of the zitterbewegung effect"

Bernardini, A. E.

We seek the immediate description of chiral oscillations in terms of the trembling motion described by the velocity (Dirac) operator alpha. By taking into account the complete set of Dirac equation solutions, which results in a free propagating Dirac wave packet composed by positive and negative frequency components, we report about the well-established zitterbewegung results and indicate how chiral oscillations can be expressed in terms of the well-known quantum oscillating variables. We conclude with the interpretation of chiral oscillations as very rapid position oscillation projections onto the longitudinally decomposed direction of the motion.

European Physical Journal C 50[3], 673-678. 2007.

P 084-07 "Compositional modulation and surface stability in InGaP films: Understanding and controlling surface properties"

Bortoleto, J. R. R., Gutierrez, H. R., and Cotta, M. A.

We investigate the formation of compositional modulation and atomic ordering in InGaP films. Such bulk properties-as well as surface morphologies-present a strong dependence on growth parameters, mainly the V/III ratio. Our results indicate the importance of surface diffusion and, particularly, surface reconstruction for these processes. Most importantly from the application point of view, we show that the compositional modulation is not necessarily coupled to the surface instabilities, so that smooth InGaP films with periodic compositional variation could be obtained. This opens a new route for the generation of templates for quantum dot positioning and three-dimensional arrays of nanostructures.

Journal of Applied Physics 101[6]. 064907. 2007.

P 085-07 "Coupling phenomena and vortex transitions in superconducting Ni/Nb multilayers"

Siqueira, E. C. and de Lima, O. F.

We have studied some structural and superconducting properties of Ni/Nb multilayered films prepared by magnetron sputtering. Magnetization measurements allowed us to establish a rich H x T diagram that indicates a 3D-2D dimensional crossover of the vortex system, as revealed by the parallel upper critical field behavior. Consistently, it was identified a possible decoupling line associated with the transition of Abrikosov vortex lines into vortex pancakes, starting around the same crossover region. An irreversibility line was also determined and it suggests different regimes of the vortex matter, where the role played by the Ni ferromagnetic layers might be relevant.

Journal of Materials Science 42[7], 2318-2322. 2007.

P 086-07 "Diffraction and an infrared finite gluon propagator"

Luna, E. G. S.

We discuss some phenomenological applications of an infrared finite gluon propagator characterized by a dynamically generated gluon mass. In particular we compute the effect of the dynamical gluon mass on pp and,pp diffractive scattering. We also show how the data on gamma p photoproduction and hadronic gamma gamma reactions can be derived from the pp and pp forward scattering amplitudes by assuming vector meson dominance and the additive quark model.

Brazilian Journal of Physics 37[1], 84-87. 2007.

P 087-07 "Domain wall formation and spin reorientation in finite-size magnetic systems"

Fernandes, R. M., Westfahl, H. W., Magalhaes-Paniago, R., and Coelho, L. N.

We investigate the formation of stable one-dimensional Neel walls in a ferromagnetic slab with finite thickness and finite width. Taking into account the dipolar, the exchange and the uniaxial anisotropic crystalline field interactions, we derive an approximative analytical self-consistent expression that gives the wall width in terms of ratios between the three different energy scales of the problem. We also show that, even when the crystalline anisotropy does not favour the formation of domain walls, they can yet be formed due to the dipolar interaction and the finiteness of the system. Moreover, using a Stoner-Wohlfarth approach, we study the magnetization reorientation inside the domains under the action of an external magnetic field and obtain the respective hysteresis loops, showing that their shapes change from squared to inclined as the width of the slab varies. Finally, we discuss possible applications of this model to describe qualitatively some recent experimental data on thin films of MnAs grown over GaAs substrates.

Journal of Magnetism and Magnetic Materials 312[2], 314-323. 2007.

P 088-07 "Effect of hydrogen on the structural, magnetic and magnetocaloric properties of the Gd5Ge2.1Si1.9 compound"

Carvalho, A. M. G., Alves, C. S., Colucci, C. C., Bolanho, M. A., Coelho, A. A., Gama, S., Nascimento, F. C., and Cardoso, L. P.

The effect of hydrogen absorption (<= 2.50 hydrogen atoms per formula unit) in the Gd5Ge2.1Si1.9) magnetocaloric compound is investigated by magnetic and X-ray diffraction measurements. Room temperature Rietveld refinement shows that even at low hydrogen content in the base sample (1600 degrees C/48 h annealed Gd5Ge2.1Si1.9) an orthorhombic Gd5Si4-type structure is stabilized. The hydrogen absorption: (i) increases a-axis and b-axis and decreases the c-axis parameter; (ii) destroys the first-order magneto-structural transition (magnetization versus temperature data); (iii) decreases the Curie temperature and, (iv) drastically reduces the isothermal variation of entropy (Delta S-T), as expected for this compound when stabilized in the orthorhombic structure.

Journal of Alloys and Compounds 432[1-2], 11-14. 2007.

P 089-07 "Effect of Tm substitution on the magnetic and magnetocaloric properties in the intermetallic compounds (Tb1-xTmx)Co-2"

Singh, N. K., Kumar, P., Suresh, K. G., Coelho, A. A., Gama, S., and Nigam, A. K.

The magnetic and magnetocaloric properties of the intermetallic compounds Tb1-xTmxCo2 (with x = 0, 0.2 and 0.5) have been studied. It is found that partial replacement of Tb by Tm in TbCo2 leads to a reduction in the ordering temperature, which is attributed to the decrease in the exchange strength due to the lower spin value of Tm3+ as compared with that of Tb3+. The analysis of the zero-field heat capacity data at low temperature shows that the coefficient of electronic heat capacity increases with increase in Tm content and is attributed to the presence of local spin fluctuations. The variation of the magnetocaloric effect (MCE) has been explained on the basis of the magnetic properties. Temperature dependence of the MCE shows that this system may be useful for magnetic refrigeration applications in a sub-room temperature regime

Journal of Physics D-Applied Physics 40[6], 1620-1625. 2007.

P 090-07 "Effects of magnetic interparticle coupling on the blocking temperature of ferromagnetic nanoparticle arrays"

Knobel, M., Nunes, W. C., Winnischofer, H., Rocha, T. C. R., Socolovsky, L. M., Mayorga, C. L., and Zanchet, D.

In this work we report on the study of the magnetic properties of 2D arrays and 3D dispersions of colloidal iron oxide nanoparticles prepared by Langmuir-Blodgett technique and by dilution in paraffin wax solid solution, respectively. The influence of magnetic interparticle coupling on the superparamagnetic relaxation behavior was investigated by means of DC magnetization measurements. A quantitative analysis of the field dependence of the blocking temperature and the role of the interparticle coupling is presented. We explain our results using a phenomenological model based on the random anisotropy and micromagnetic theories that account for particle coupling effects in the superparamagnetic properties.

Journal of Non-Crystalline Solids 353[8-10], 743-747. 2007.

P 091-07 "Electronic and structural properties of implanted xenon in amorphous silicon"

Barbieri, P. F., Landers, R., and Marques, F. C.

The electronic and structural characteristics of xenon implanted in amorphous silicon are investigated. A different implantation approach, in which xenon atoms are implanted during the film deposition, was developed. Up to about 5 at. % of xenon were implanted at energy as low as 100 eV. X-ray absorption spectroscopy reveals that xenon atoms are dispersed in the amorphous Si network. The xenon 3d(5/2) binding energy, from x-ray photoelectron spectroscopy, as well as the initial state contribution and relaxation energy, from x-ray excited Auger electron spectroscopy, depend on the implantation energy and indicate that the xenon atoms are trapped in voids of different sizes.

Applied Physics Letters 90[16]. 164104. 2007.

P 092-07 "Field enhancement within an optical fibre with a subwavelength air core"

Wiederhecker, G. S., Cordeiro, C. M. B., Couny, F., Benabid, F., Maier, S. A., Knight, J. C., Cruz, C. H. B., and Fragnito, H. L.

Tightly confined light enables a variety of applications ranging from nonlinear light management to atomic manipulation. Photonic-crystal fibres (PCFs) can provide strong guidance in very small cores while simultaneously offering long interaction lengths(1). However, light confinement in waveguides is usually ultimately limited by diffraction(2,3), which tends to spread light away from the waveguiding core, despite its higher refractive index. It was recently demonstrated that such spreading fields can be trapped by a nanometre-scale slot inside a strongly guiding silicon-on-insulator (SOI) waveguide(4,5). In this letter we demonstrate the concentration of optical energy within a subwavelength-scale air hole running down the length of a PCF core. The core resembles a submicrometre-diameter tube with a bore diameter of 200 nm or less. The high intensity in an air hole, coupled with long interaction lengths, promises a new class of experiments in light-matter interaction and nonlinear fibre optics

Nature Photonics 1[2], 115-118. 2007.

P 093-07 "Formation kinetics of silver triangular nanoplates"

Rocha, T. C. R., Winnischofer, H., Westphal, E., and Zanchet, D.

We addressed the wavelength dependence of the photochemical synthesis of silver nanoplates, giving special attention to the particles growth at early stages of the reaction. By using wavelengths out of resonance with the surface plasmon peak of the initial seeds, we could clearly identify two different stages in the particles growth: the first one, at the beginning of the reaction, in which the consumption of Ag+ is very small, and the second one, in which the consumption of Ag+ is much larger. The correlation of this data with the morphological changes of the particles helped us to both corroborate some aspects of the growth mechanism proposed by Maillard et al.(1) and find that the main factor determining the particle anisotropy takes place at the early stages of the reaction and does not appear to be correlated with the excitation of the surface plasmon resonance or incident wavelength. We hope that the strong evidence presented here, based on a set of independent measurements, will help shed new light in the mechanism of shape control in this complex system.

Journal of Physical Chemistry C 111[7], 2885-2891. 2007.

P 094-07 "Improvement on the complex optical potential for electron collisions with atoms and molecules"

Lee, M. T., Iga, I., Machado, L. E., Brescansin, L. M., Castro, E. A. Y., Sanches, I. P., and de Souza, G. L. C..

The main goal of this work is to search for an effective potential that describes realistically the dynamics of electron-atom (-molecule) interactions over a wide incident energy range. We present a modification in the model absorption potential based on the quasi-free electron and binary-encounter approximations, originally proposed by Staszewska et al. Basically, in our model, an empirical scaling factor is proposed in order to correct the distortion of the absorption potential caused by the free-electron-gas approximation. This factor uses two parameters which are independent of targets and incident energies, therefore can be used as predictive purpose for a general target. Results for some atomic and molecular targets have shown the effectiveness of the present model.

Journal of Electron Spectroscopy and Related Phenomena 155[1-3], 14-20. 2007.

P 095-07 "Lorentz-violating dilatations in momentum space and some extensions on nonlinear actions of Lorentz-algebra-preserving systems"

Bernardini, A. E. and da Rocha, R.

We work on some general extensions of the formalism for theories which preserve the relativity of inertial frames with a nonlinear action of the Lorentz transformations on momentum space.

Relativistic particle models invariant under the corresponding deformed symmetries are presented with particular emphasis on deformed dilatation transformations. The algebraic transformations relating the deformed symmetries with the usual (undeformed) ones are provided in order to preserve the Lorentz algebra. Two distinct cases are considered: a deformed dilatation transformation with a spacelike preferred direction and a very special relativity embedding with a lightlike preferred direction. In both analysis we consider the possibility of introducing quantum deformations of the corresponding symmetries such that the spacetime coordinates can be reconstructed and the particular form of the real space-momentum commutator remains covariant. Eventually feasible experiments, for which the nonlinear Lorentz dilatation effects here pointed out may be detectable, are suggested.

Physical Review D 75[6]. 065014. 2007.

P 096-07 "Mechanical properties of carbon nanotube networks by molecular mechanics and impact molecular dynamics calculations"

Coluci, V. R., Dantas, S. O., Jorio, A., and Galvao, D. S.

We report a theoretical investigation of the mechanical properties of idealized networks formed by single-walled carbon nanotubes showing crossbar and hexagonal architectures. The study was performed by using molecular mechanics calculations and impact dynamics simulations based on bond-order empirical potential. The studied networks were predicted to have elasticity modulus of similar to 10-100 GPa and bulk modulus of similar to 10 GPa. The results show a transition from high to moderate flexibility during the deformation stages. This behavior was associated with the existence of two deformation mechanisms presented by the network related to the nanotube stretching and junction bending processes.

Physical Review B 75[7]. 075417. 2007.

P 097-07 "Minimal set of local measurements and classical communication for two-mode Gaussian state entanglement quantification"

Haruna, L. F., de Oliveira, M. C., and Rigolin, G.

We develop the minimal requirements for the complete entanglement quantification of an arbitrary two-mode bipartite Gaussian state via local measurements and a classical communication channel. The minimal set of measurements is presented as a reconstruction protocol of local covariance matrices and no previous knowledge of the state is required but its Gaussian character. The protocol becomes very simple mostly when dealing with Gaussian states transformed to its standard form, since photocounting or intensity measurements define the whole set of entangled states. In addition, conditional on some prior information, the protocol is also useful for a complete global state reconstruction.

Physical Review Letters 98[15]. 150501. 2007.

P 098-07 "Mode transitions and hysteresis in inductively coupled plasmas"

Daltrini, A. M., Moshkalev, S. A., Monteiro, M. J. R., Besseler, E., Kostryukov, A., and Machida, M.

Optical emission spectroscopy as a noninvasive plasma diagnostic was employed to study mode transitions and hysteresis in an inductively coupled plasma in Ar and Ar/N-2 mixtures. Using selected Ar lines, basic plasma parameters, relevant to the analysis of the mode transitions, were evaluated. Small changes of the electron energy distribution function in the vicinity of the mode transition were detected. The role of metastable Ar atoms in mode transitions and in a hysteresis was clarified. Enhanced production of metastables in the hysteresis region as well as faster transitions in plasmas with higher influence of metastables were observed.

Journal of Applied Physics 101[7]. 073309. 2007.

P 099-07 "Mott transition in the Hubbard model away from particle-hole symmetry"

Garcia, D. J., Miranda, E., Hallberg, K., and Rozenberg, M. J

We solve the dynamical mean-field theory equations for the Hubbard model away from the particle-hole-symmetric case using the density matrix renormalization group method. We focus our study on the region of strong interactions and finite doping where two solutions coexist. We obtain precise predictions for the boundaries of the coexistence region. In addition, we demonstrate the capabilities of this precise method by obtaining the frequency-dependent optical conductivity spectra.

Physical Review B 75[12]. 121102. 2007.

P 100-07 "On the annealing of fission tracks in randomly oriented grains of apatite"

Guedes, S., Curvo, E. A. C., Tello, C. A., Hadler, J. C., Iunes, P. J., Paulo, S. R., and Palissari, R.

Apatite fission-track thermochronology has been based upon measurements in prismatic sections. Until now, all annealing data sets referred to this kind of measurement. However, prismatic sections are not always available, e.g. for detrital apatite grains, making the work impossible. An alternative would be to use grains in any orientation. This requires that a suitable annealing model be employed, i.e. one obtained from measurements in grains without preferential orientation. In this work, the angular distribution of confined fission tracks parallel to the surfaces of grains randomly oriented relative to the crystallographic c-axis is obtained. This distribution shows that track at higher angles relative to c-axis, when compared with the prismatic section distribution, are found. The procedure measurements in randomly oriented sections is presented along with empirical model equations. Model parameters have been obtained for the most common empirical equations and the partial annealing zone has been calculated for these equations. Results are compared with geological benchmarks; the fanning linear Arrhenius model yields the best agreement. This empirical model and those most used in literature have been applied to samples from the Sao Francisco Craton, Brazil, to show an instance in which the effects of grain orientation is important. Thermal histories of geological samples have been obtained through these equations. The samples tested presented moderate annealing and experienced a relatively simple thermal history. Under these conditions, taking into account the uncertainties in the model equations and confined track measurements, and using compatible systems, the presented model equations and the most used prismatic face ones constrained the same thermal history feature.

Nuclear Instruments & Methods in Physics Research Section B-Beam Interactions with Materials and Atoms 256[2], 683-692. 2007.

P 101-07 "On the Franca and Hama analysis of elastic hadron scattering"

Menon, M. J.

After reviewing the main aspects of the model-independent analysis on elastic proton-proton scattering, developed by Franqa and Hama in the seventies, we argue that the work can be considered a paradigm for empirical analysis on elastic hadron interactions (the inverse problem). We discuss some further developments, consequences and results that have been recently obtained on the subject and which have been based on the original strategy by Franga and Hama.

Brazilian Journal of Physics 37[1A], 9-12. 2007.

P 102-07 "On the slope of the elastic differential cross sections"

Campos, S. D., Menon, M. J., and Montanha, J.

Making use of a model-independent analytical fit for the elastic hadron-hadron amplitude, recently developed, we investigate the slope of the proton-proton and antiproton-proton differential cross sections, as a function of the energy and the momentum transfer. We show that the predictions for these quantities are in agreement with the experimental data available and discuss the effect of the slope position as function of the momentum transfer.

Brazilian Journal of Physics 37[1], 80-83. 2007.

P 103-07 "Oscillating Nernst-Ettingshausen effect in bismuth across the quantum limit"

Behnia, K., Measson, M. A., and Kopelevich, Y.

In elemental bismuth, 10(5) atoms share a single itinerant electron. Therefore, a moderate magnetic field can confine electrons to the lowest Landau level. We report on the first study of metallic thermoelectricity in this regime. The main thermoelectric response is off-diagonal with an oscillating component several times larger than the nonoscillating background. When the first Landau level attains the Fermi energy, both the Nernst and the Ettingshausen coefficients sharply peak, and the latter attains a temperature-independent maximum. These features are yet to be understood. We note a qualitative agreement with a theory invoking current-carrying edge excitations.

Physical Review Letters 98[16]. 166602. 2007.

P 104-07 "Pattern recognition methods investigation of ellipticines structure-activity relationships"

de Melo, L. C., Braga, S. F., and Barone, P. M. V. B.

Ellipticine is a molecule derived from the natural extract Ochrosia elliptica. This molecule and its derivatives are highly cytotoxic to malignant cultured cells. The relatively simple structure of ellipticine has prompted chemists to design various structural modifications in order to obtain either more active derivatives or information on the structural moieties required for pharmacological activities. In the present work we report theoretical structure-activity relationship studies for 40 ellipticine derivatives using pattern-recognition methods such as electronics indices methodology (EIM), principal component analysis (PCA) and hierarchical clustering analysis (HCA) with molecular descriptors obtained from semiempirical parametric method 3 (PM3) calculations. By applying selected molecular descriptors it was possible to classify active and inactive compounds with accuracy up to 92% and also to suggest the activity of new untested molecules. These descriptors have been only recently discussed in the literature as new possible universal parameters for defining the biological activity of several classes of compounds.

Journal of Molecular Graphics & Modelling 25[6], 912-920. 2007.

P 105-07 "Prediction of the hydrogen storage capacity of carbon nanoscrolls"

Coluci, V. R., Braga, S. F., Baughman, R. H., and Galvao, D. S.

Classical grand-canonical Monte Carlo simulations were performed to investigate the equilibrium hydrogen storage capacity of carbon nanoscrolls. The results show that hydrogen molecules can be absorbed in the internal cavity as well as on the external surface of the scroll when the interlayer spacing is less than 4.4 A. When the interlayer spacing is increased to 6.4 A, by assuming spacing increase due to intercalation of other species, the hydrogen molecules can also be incorporated in the interlayer galleries, doubling the gravimetric storage capacity and reaching 5.5 wt % hydrogen per weight carbon at 150 K and 1 MPa. Our results showed that intercalated carbon nanoscrolls may be a promissing material for hydrogen storage

Physical Review B 75[12]. 125404. 2007.

P 106-07 "Semiclassical tunnelling of wavepackets with real trajectories"

Jaubert, L. D. C. and de Aguiar, M. A. M.

Semiclassical approximations for tunnelling processes usually involve complex trajectories or complex times. In this paper, we use a previously derived approximation involving only real trajectories propagating in real time to describe the scattering of a Gaussian wavepacket by a finite square potential barrier. We show that the approximation describes both tunnelling and interferences very accurately in the limit of small Planck's constant. We use these results to estimate the tunnelling time of the wavepacket and find that, for high energies, the barrier slows down the wavepacket but that it speeds it up at energies comparable to the barrier height.

Physica Scripta 75[3], 363-373. 2007.

P 107-07 "Short linear atomic chains in copper nanowires"

Amorim, E. P. M., da Silva, A. J. R., Fazzio, A., and da Silva, E. Z.

We have performed realistic molecular dynamics simulations of copper nanowires (NWs) under stress along some crystallographic directions until their rupture to help understand the properties of these NWs at an atomistic level. We compare the structural arrangement during the elongation with the dynamical evolution of copper NWs observed in high resolution transmission electron microscopy (HRTEM) experiments, and they are in good agreement. Finally, we report the formation of short linear atomic chains (LACs) before breaking that occurs in all cases indicating the possibility to use copper as metallic nanocontacts.

Nanotechnology 18[14]. 145701. 2007.

P 108-07 "Sodium dodecyl sulfate adsorbed monolayers on gold electrodes"

Soares, D. M., Gomes, W. E., and Tenan, M. A.

Self-assembled aggregates of amphiphilic surfactant molecules formed on solid surfaces are similar to biological membranes. To understand the formation mechanism of these aggregates, we have studied the formation of self-organized monolayers from low-concentration sodium dodecyl sulfate (SDS) aqueous solutions (concentration below the critical micelle concentration) on gold surfaces. The study has been carried out by using simultaneously quartz crystal microbalance (QCM) and open circuit potential measurements in situ. We have developed a model which explains the variation of the QCM frequency and open circuit potential following SDS additions to water. The dominant growth mechanism during the major part of film formation was demonstrated to be surface diffusion of surfactant molecules.

Langmuir 23[8], 4383-4388. 2007.

P 109-07 "Structural and optical properties of InP quantum dots grown on GaAs(001)"

de Godoy, M. P. F., Nakaema, M. K. K., Iikawa, F., Brasil, M. J. S. P., Lopes, J. M. J., Bortoleto, J. R. R., Cotta, M. A., Magalhaes-Paniago, R., Morschbacher, M. J., and Fichtner, P. F. P.

We investigated structural and optical properties of type-II InP/GaAs quantum dots using reflection high energy electron diffraction, transmission electron microscopy, atomic force microscopy, grazing incidence x-ray diffraction, and photoluminescence techniques. The InP dots present an efficient optical emission even when they are uncapped, which is attributed to the low surface recombination velocity in InP. We compare the difference in the optical properties between surface free dots, which are not covered by any material, with dots covered by a GaAs capping layer. We observed a bimodal dispersion of the dot size distribution, giving rise to two distinct emission bands. The results also revealed that the strain accumulated in the InP islands is slightly relieved for samples with large InP amounts. An unexpected result is the relatively large blue shift of the emission band from uncapped samples as compared to capped dots.

Journal of Applied Physics 101[7]. 073508. 2007.

P 110-07 "Structural defects and their role in the growth of Ag triangular nanoplates"

Rocha, T. C. R. and Zanchet, D.

The influence of structural defects in the formation of silver nanoplates synthesized by the photochemical seed-mediated method is addressed. The results show that anisotropic growth starts at the very beginning of the reaction by epitaxial anisotropic deposition of Ag atoms on defective seeds. Insights into the role of capping molecules and the minor role played by surface plasmon excitation regarding the origin of the anisotropy in this method are provided.

Journal of Physical Chemistry C 111[19], 6989-6993. 2007.

P 111-07 "Superparamagnetic nanoparticle-supported palladium: a highly stable magnetically recoverable and reusable catalyst for hydrogenation reactions"

Rossi, L. M., Silva, F. P., Vono, L. L. R., Kiyohara, P. K., Duarte, E. L., Itri, R., Landers, R., and Machado, G.

Here we present a magnetically recoverable palladium catalyst prepared by immobilization of palladium over silica-coated magnetite nanoparticles. The catalyst reduced by molecular hydrogen contains palladium nanoparticles well distributed and stabilized in the magnetizable support surfaces and converts cyclohexene to cyclohexane under mild reaction conditions (75 degrees C and 6 atm) with TOF of 11 500 h(-1). The catalyst was easily recovered with a permanent magnet in the reactor wall and reused for up to 20 recycles of 2500 TON each without any significant loss in catalytic activity, demonstrating an efficient recycling process for hydrogenation reactions.

Green Chemistry 9[4], 379-385. 2007.

P 112-07 "Surface effects on moving vortices in superconducting stripes"

Reis, J. D., Venegas, P. A., Mello, D. F., and Cabrera, G. G.

Size and surface dynamical effects are investigated in thin superconducting stripes with variable width. We perform numerical simulations of the vortex dynamics, with the inclusion of the surface confining potential and a random distribution of pinning centers. To fully characterize the vortex flow, we calculate the differential resistance, the transverse diffusion coefficient, the structure factor and the intensity of the Bragg peaks, as functions of the transport force. We found that surface effects induce a premature ordering of the flux line lattice, and the system displays plastic and smectic behavior only in a very narrow range of forces.

Physica C-Superconductivity and Its Applications 454[1-2], 15-19. 2007.

P 113-07 "Temperature detection method based on the magnetoirnpedance effect in soft magnetic nanocrystalline alloys"

Gomez-Polo, G., Socolovsky, L. M., Knobel, M., and Vazquez, M.

The temperature dependence of the ac electrical impedance is analysed in a soft magnetic Fe based nanocrystalline wire. An amorphous Fe73.5Si13.5B9Cu1Nb3 wire (diameter 20 mu m) was annealed in vacuum at 550 degrees C during 30 min, leading to a nanocrystalline structure. The magnetoimpedance characterisation indicates the occurrence of a sharp decrease in the electrical impedance around the Curie temperature, T-Ca, of the residual amorphous phase (340 degrees C). The thermal dependence of the electrical impedance, Z(T), is analysed and estimated taking into account the temperature dependence of the magnetic permeability. The basic characteristics of Z(T) correlated to its potential application as temperature detectors are analysed. The results indicate that the sensor span (measuring temperature range) can be suitably controlled through the main parameter that controls the magnetization process of the samples around T-Ca, i.e., the mean circumferential magnetic field acting on the sample (amplitude of the exciting electrical current).

Sensor Letters 5[1], 196-199. 2007.

P 114-07 "Thermal-lens study of thermo-optical properties of tellurite glasses"

Pilla, V., Chillcce, E. F., Neves, A. A. R., Munin, E., Catunda, T., Cesar, C. L., and Barbosa, L. C.

Mode-mismatched Thermal Lens (TL) measurements were performed in 70TeO(2)-19WO(3)-7Na(2)O-4Nb(2)O(5) (% mol) tellurite glasses doped with either Er3+ or Tm3+ and co-doped with Er3+/Tm3+ ions. Thermo-optical parameters (D, K, ds/dQ and ds/dT) were obtained in function of thulium concentrations (0.39-1.6) x 10 20 ions/cm(3). For Er3+/Tm3+ co-doped tellurite glasses, D and K values are practically independent of the Tm3+ concentrations used in this study. The average values of D and ds/dT obtained for tellurite glasses are: (3.1 +/- 0.2) x 10(-3) supercript stopcm(2)/s and (16 +/- 3) x 10(-6) stopK(-1), respectively.

Journal of Materials Science 42[7], 2304-2308. 2007.

P 115-07 "Three-body interactions in the condensed phases of helium atom systems"

Ujevic, S. and Vitiello, S. A.

In this work we investigate how the description of several properties of helium atoms in the condensed phases are affected by the three-body terms of a very accurate inter- atomic potential. We introduce two phenomenological parameters in the three- body part of the inter- atomic potential in order to describe properly the equations of state of the solid and liquid phases. The calculations were performed using the multi- weight extension to the diffusion Monte Carlo method which allows accurate calculations of small energy differences in a significant way. The results show how the equations of state for both the liquid and solid phases and properties like the isothermal compressibility, the equilibrium, melting and freezing densities are affected by three- body interactions.

Journal of Physics-Condensed Matter 19[11]. 116212. 2007.

P 116-07"Transport and magnetic properties of Ce2Niln3"

Rojas, D. P., Pereira, L. C. J., Lopes, E. B., Waerenborgh, J. C., da Silva, L. M., Gandra, F. G., and Medina, A. N.

We report results on transport and magnetic properties for the title compound. Spin-glass (SG) features arise below the temperature of T-f = 2.8 K for Ce2Niln3, as determined from ac and dc magnetic susceptibility. The low temperature specific heat presents an anomaly with a maximum located near T-f which is unusual when compared with other compounds of the type Ce2TX3 (where T = transition metal and X = Si, Ge) and canonical SG systems. The anisotropic SG behavior or inhomogeneous magnetic ordering have been proposed as the possible causes for the arising magnetic ground state. The results for Ce2Niln3 are compared with those obtained for Ce2NiGe3, isotypic compound.

Journal of Alloys and Compounds 432[1-2], 34-38. 2007.

P 117-07"Ultrafine Co1-xZnxFe2O4 particles synthesized by hydrolysis: Effect of thermal treatment and its relationship with magnetic properties"

Duong, G. V., Turtelli, R. S., Nunes, W. C., Schafler, E., Hanh, N., Grossinger, R., and Knobel, M.

Co1-xZnxFe2O4 (= 0, 0.2 and 0.4) fine powders with particles size of 3 nm were prepared by hydrolysis method. The powders were annealed at 500 degrees C for 3 h. With heat treatment, the average particles size increased to 12 nm with corresponding increase in blocking temperature, saturation magnetization and reduced remanence. A significant increase in coercive field was found only for the pure CoFe2O4.

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Abstracta

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