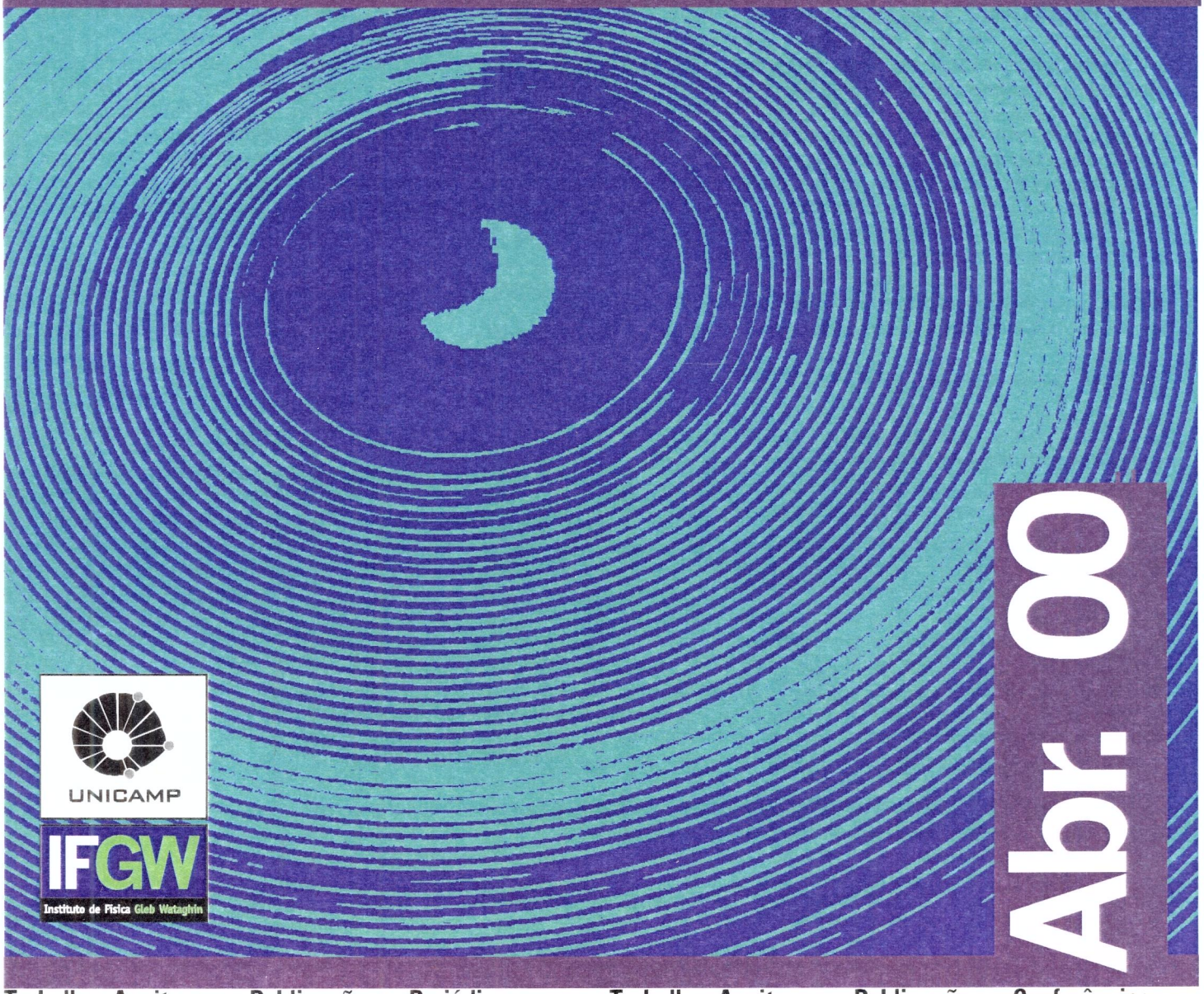
Abstracta



Trabalhos Aceitos para Publicação em Periódicos

A 010- 00 Internal stress-induced changes of impurity coordination and doping mechanisms in a-Ge:H doped with Column III metals.

A 011-00 Thermomechanical properties of amorphous hydrogenated carbon-germanium alloys.

A 012 - 00 Behavior of the diffractive cross section in hadron-nucleus collisions.

A 013 - 00 On the structure of argon assisted amorphous carbon films.

A 014 - 00 Dielectric relaxation time measurement in absorbing photorefractive materials.

A 015- 00 Weberian Induction.

A 016 - 00 Foundations of a nonequilibrium ensemble formalism.

A 17 - 00 Derivation in a nonequilibrium ensemble formalism of a far-reaching generalizations of a quantum Boltzmann theory.

Trabalhos Aceitos para Publicação em Conferências

C 002-00 Critical current study using as susceptibility measurements in $ErBa_2Cu_3O_{7-\delta}$ crystal showing the fishtail effect.

C 003-00 Er environment in a-Si:H(Er(prepared by PECVD.

C 004-00 Universal behavior of ac susceptibility measurements in type-II superconductors.

C 005- 00 Rare earth ionic size dependence of T_c in $RBaSrCu_3O_7$(R=Y,Dy,Nd, and La) series.

C 006-00 Grain clusters contribution to the multilevel granular behavior in melt-textured $YBa_2Cu_3O_{7-d}$.

C 007-00 Structural studies $Er_{1-x}Ca_xBa_2Cu_3O_{7-\delta}$: oxygen vacancies in Cu - O_2 planes.

C 008-00 UPS of a-Si:H<Er>: What is the energy of the Er 4f states?

Trabalhos aceitos para publicação em periódicos

A 010-00 Internal stress-induced changes of impurity coordination and doping mechanisms in a-Ge:H doped with Column-III metals.

I. Chambouleyron and D. Comedi,G. Dalba, P. Fornasini, R. Grisenti and F. Rocca

Extended X-Ray Absorption Fine Structure (EXAFS) measurements in Ga and In doped hydrogenated amorphous germanium (a-Ge:H) reveal that practically all highly diluted impurities (<1.5x10^18cm-3) adopt the 4-fold coordination of the host network. However, only less than 1% of them is electronically active. As the impurity concentration increases,the Ga and In mean coordination rapidly decrease from 4 to less than 3,for doping levels which are an order-of-magnitude different for Ga and In. The analysis of the overall EXAFS data suggests that this effect is triggered by the relaxation of the internal stress accumulated in the a-Ge:H network due to the increasing Ga or In incorporation.

Solid State Communications, accepted on March 2000.

A 011-00 Thermomechanical properties of amorphous hydrogenated carbon-germanium alloys.

F. C. Marques, J. Vilcarromero and R.G. Lacerda

Thermomechanical properties of amorphous hydrogenated carbon-germanium alloys prepared by the rf sputtering technique were determined for films in the 0 at. % to 100 at. % carbon content range. The stress, thermal expansion coefficient, and elastic modulus were obtained using the thermally induced bending technique. The stress was related to the concentration of hydrogen and argon, to the difference in the Ge-Ge and Ge-C bond length, and to the carbon hybridization. The thermal expansion coefficient of pure amorphous germanium and amorphous carbon are higher than that of their corresponding crystalline counterparts, which was attributed to the compressive stress of the films. The biaxial modulus, on the other hand, are always smaller than that of their crystalline counterparts, but increases as the concentration of carbon increases due to the substitution of Ge-Ge bonds by energetically stronger Ge-C and C-C bonds.

Applied Physics A, accepted on March 2000.

A 012-00 Behavior of the diffractive cross section in hadron-nucleus collisions.

M. Batista, R. J. M. Covolan, A. N. Pontes

A phenomenological analysis of diffractive dissociation of nuclei in proton-nucleus and meson-nucleus collisions is presented. The theoretical approach employed here is able to take into account at once data of the HELIOS and EHS/NA22 collaborations that exhibit quite different atomic mass dependences. Possible extensions of this approach to hard diffraction in nuclear processes are also discussed.

Physical Review C, accepted on March 2000.

A 013 - 00 On the structure of argon assisted amorphous carbon films.

R. G. Lacerda, P. Hammer, F. L. Freire Jr., F. Alvarez and F. C. Marques.

We report a study of amorphous carbon films prepared by Ion Beam-Assisted deposition (IBAD). X-ray and ultraviolet photoelectron spectroscopy were used for probing the photoelectron core level and valence band of the films, respectively. Raman spectra, stress, and film density were also determined. The intrinsic compressive stress and plasmon energy increase sharply for argon assisting energies up to 100 eV, and vary slightly for energy in the 100 eV to 650 eV range. The highest stress (>10 GPa) and plasmon energy (29.5 eV), achieved at about 400 eV argon assisting energy, are of the same order of those reported for highly tetrahedral amorphous carbon films. However, structural investigations indicate that the material is composed of a highly compressed and dense sp^2 network.

Diamond and Related Materials, accepted on March 2000.

A 014 -00 Dielectric relaxation time measurement in absorbing photorefractive materials.

Ivan de Oliveira and Jaime Frejlich

We show that absorbing photorefractive materials characterized by a space-charge exponential relaxation time law exhibit an overall hologram optical erasure that is described by the so called exponential integral function, as far as self-diffraction can be neglected. This fact is due to the bulk absorption producing an exponentially decreasing distribuition of the erasure beam irradiance along the sample thickness that results in a correspondingly increasing dielectric relaxation time. The theoretical development in this paper is experimentally verified by the analysis of the holographic erasure in a nominally undoped $Bi_{12}TiO_{20}$ photorefractive crystal using the 514.5nm laser wavelength where this material exhibits a relatively strong bulk absorption. Neglecting absorption in this experimental leads to a relaxation time that is about 4-fold larger than the actual value.

Optics Communications, accepted on April 2000.

A 015-00 Weberian induction.

A. K. T. Assis, J. Fukai and H. B. Carvalho

Various kinds of the electric polarization of a rotating metallic disc are discussed. A new kind of induction is predicted by Weber´s electrodynamics, but not by Maxwellian electrodynamics. An experimental test to check this new effect is proposed.

Physics Letters A, accepted on April 2000.

A 016-00 Foundations of a nonequilibrium ensemble formalism.

Roberto Luzzi, Áurea R.Vasconcellos, J. Galvão Ramos

to Dimitrii N. Zubarev in memoriam

We describe a particular approach for the construction of a nonequilibrium statistical ensembe formalism for the treatement of dissipative many-body systems. This is the

socalled Nonequilibrium Statistical Operator Method, based on the seminal and fundamental ideas set forward by Boltzmann and Gibbs. The existing approaches can be unified under a unique variational principle , namely, MaxEnt, which we consider here. The main six basic steps that are at the foundations of the formalism are presented and the fundamental concepts are discussed. The associated nonlinear quantum kinetic theory and the accompanying Statistical Thermodynamics (the Informational Statistical Thermodynamics) are very briefly described. The corresponding response function theory for systems away from equilibrium allows to connected the theory with experiments, and some examples are summarized; there follows a good agreement between theory and experimental data in the cases in which the latter are presently available. We also present an overview of some conceptual questions and associated criticisms.

Journal of Modern Physics B, accepted on March 2000.

A 017-00 Derivation in a nonequilibrium ensemble formalism of a far-reaching generalizations of a quantum Boltzmann theory.

J. Galvão Ramos, A. R. Vasconcellos, Roberto Luzzi

Within the framework of the nonequilibrium statistical ensemble formalism provided by the Nonequilibrium Stastitical Operator Method, we derive a quantum Boltzmann-style transport theory of a broad scope. This is done by choosing the single-particle and two-particle dynamical density operators as the basic informational-statistical variables. The equations of evolution for their average values over the nonequilibrium ensemble, the nonequilibrium reduced Dirac-Landau-Bogoliubov-type density matrices, are obtained. From the resulting generalized nonlinear quantum transport theory, after resorting to perturbative-like expansions, it is derived a far-reaching generalization of Boltzmann equation for the single-particle distribution function. A type of traditional Boltzmann equation follows after using stringent approximations, whose limits of validity are evaluated.

Physica A, accepted on March 2000.

Trabalhos Aceitos para Publicação em Conferências

C 002-00 Critical current study using as susceptibility measurements in $ErBa_2Cu_3O_{7-\delta}$ crystal showing the fishtail effect.

C.A. Cardoso, M. A.Avila, R. A. Ribeiro, and O. F. Lima

Different X_{ac} measurents can be collaped into a single curve if plotted against the ac penetration depth $\delta = h/Jd$. Further, using this scaling law, it is possible to obtain the frequency dependence of the shielding current density J(ν, B,T). In this work , this scaling relation was tested for a $ErBa_2Cu_3O_{7-\delta}$ single crystal. The frequency dependence of J(ν, B,T) displays a behavior closely related with the second magnetization peak ("fishtail effect") observed in M x H curves. This result supports a dynamical interpretation for the fihtail effect.

Proceedings of the 6th. Int.Conf. on Mater. and Mech. of Supercond. and High-Tc Superc., Houston, Tex, Feb.20-25,2000 (Especial vol. of Physica C), accepted on February 2000.

C 003- 00 Er environment in a-Si:H(Er(prepared by PECVD.

Cinthia Piamonteze, Leandro R. Tessler, Hélio Tolentino, Maria do Carmo Martins Alves, Gerhard Weiser, E. Terukov

The Er local environment of a-Si:H<Er> prepared by PECVD using a metalorganic precursor was determined by EXAFS. We found that in as-deposited samples Er is coordinated to 6 oxygen atoms at 2.28±0.01Å, very similar to Er2O3. Annealing at 420°C hardly affects the Er neighborhood,but higher annealing temperatures (starting at 600°C up to 1033°C) decrease the Er-O separation as much as 0.5Å, maintaining the Er average coordination around 6. This is interpreted as due to the formation of a carbon second neighbor shell. Our results show that the Er local environment is not related with the luminescence enhancement for annealing at moderate temperatures.

MRS 2000 Spring Meeting, San Francisco, California, EUA, 24 a 28 de Abril 2000, accepted on April 2000.

C 004-00 Universal behavior of ac susceptibility measurements in type-II superconductors.

C. A. Cardoso and O. F. Lima

Different X_{ac} measurements can be collapsed into a single curve if plotted against the scaling variable $h\ (\varpi/\varpi)^{1-\sigma}$. In this work, we tested this relaxation for two Nb samples and one YBCO sample. The predicated scaling law for X_{ac} was verified in the Nb samples, but an unexpected frequency dependence of σ was observed in the YBCO sample. This behavior can be explained in the framework of a more general scaling law based on the critical state model.

Proceedings of the 6th. Int.Conf. on Mater. and Mech. of Supercond. and High-Tc Superc., Houston, Tex, Feb.20-25,2000 (Especial vol. of Physica C), accepted on February 2000.

C 005- 00 Rare earth ionic size dependence of T_c in $RBaSrCu_3O_7$(R=Y,Dy,Nd, and La) series.

V. P. S. Awana, C. A. Cardoso, O. F. de Lima, S. K. Malik, W. B. Yelon, Ram Prasad, A. Gupta, A. Sedky, and A.V. Narlikar

Superconducting transition temperature (T_c), measured by ac susceptibility technique, was determined for the $RBaSrCu_3O_7$ compounds with R = Y , Dy, Nd and La. Rare earth dependence of T_c in $RBaSrCu_3O_7$ series is quite different than that observed in $RBa_2Cu_3O_7$ (R:123) series. Neutron diffraction studies reveal that the title compounds with R =Y, Dy crystallize in the orthorhombic R:123 structure with orthorhombicity considerably smaller than that of the R:123 compounds. In fact, the orthorhombicity reduces so much that the $RBaSrCu_3O_7$ compounds with light rare earths, R = La and Nd, are tetragonal or almost tetragonal.

Proceedings of the 6th. Int.Conf. on Mater. and Mech. of Supercond. and High-Tc Superc., Houston, Tex, Feb.20-25,2000 (Especial vol. of Physica C), accepted on February 2000.

C 006-00 Grain clusters contribution to the multilevel granular behavior in melt-textured $YBa_2Cu_3O_{7-d}$..

F. M. Araujo-Moreira, O. F. Lima, Z. Trajanovich, V. T. Venkatesan, and W. A. Ortiz

We report on the highy anisotopic behavior of the AC field dependence of the complex magnetic susceptibility of melt-textured grown samples of $YBa_2Cu_3O_{7-d}$.We show experimental evidences of the predicted grain clusters contribution to the granular behavior. We compare bulk results with those obtained from equivalent measurements performed on a-axis and c-axis $YBa_2Cu_3O_{7-d}$ thin films. By applying the exponential critical state model we have obtained the average critical current density associated to grain clusters.

Proceedings of the 6th. Int.Conf. on Mater. and Mech. of Supercond. and High-Tc Superc., Houston, Tex, Feb.20-25,2000 (Especial vol. of Physica C), accepted on February 2000.

C 007-00 Structural studies $Er_{1-x}Ca_xBa_2Cu_3O_{7-\delta}$: oxygen vacancies in Cu - O_2 planes.

V. P. S. Awana, C. A. Cardoso, O. F. Lima, S. K. Malik, W. B. Yelon, A. Gupta, A. Sedky, and A. V. Narlikar

In the $Er_{1-x}Ca_xBa_2Cu_3O_{7-d}$ system, with x = 0.0 to 0.3, the superconducting transition temperature (T_c), as measured from ac susceptibility, decreases with increasing Ca substitution, x. Detailed analysis of the powder neutron diffraction patterns of these samples shows a decrease in oxygen content with increasing x. The orthorhombic distortion decreases slightly and the c-parameter increases with increasing x. Both, the buckling [Cu(2)-O(2)-Cu(2)] angle and the planar Cu(2)-O(2) distance in Cu-O2 planes increasw with increasing x. In creased Cu(2)-O(2) bond distance indicates a slight decrease in p-type holr carriers in Cu-O2planes. With increasing x, oxygen vacancies are created in Cu-O2 planes, which along with increased buckling angle, may be partly responsible for T_c suppression in this system.

Proceedings of the 6th. Int.Conf. on Mater. and Mech. of Supercond. and High-Tc Superc., Houston, Tex, Feb.20-25,2000 (Especial vol. of Physica C), accepted on February 2000.

C 008-00 UPS of a-Si:H<Er>: What is the energy of the Er 4f states?

Leandro R. Tessler, Cínthia Piamonteze, Ana Carola Iñiguez, Abner de Siervo, Richard Landers and Jonder Morais

One very important problem concerning erbium-doped silicon is the electronic structure of the Er3+ impurities. In particular, it is still not clear if the 4f levels can be treated as frozen core levels or their overlap with s and p states of their neighbors must be considered explicitly. For crystalline Si, the 4f levels have been supposed anywhere between 20 eV below the valence band and within the energy gap. In this paper we report on the first ultraviolet photoemission spectroscopy (UPS) measurements on Er-doped a-Si:H. Samples of a-Si:H<Er> with different Er contents (up to 1 at. % [Er]/[Si]) were prepared by co-sputtering from a Si target partially covered with metallic Er platelets. In order to enhance the Er states relative to the Si and H states, the excitation energy was tuned between 40 and 140 eV in a synchrotron light source. At 140 eV excitation energy the cross-section of the Er 4f and 5p states is more than an order of magnitude higher than the cross section of the Si 3s or 3p states. As the Er concentration increases, a shoulder and then a peak appears at 10.0±0.5 eV binding energy. The intensity and width of this peak is well correlated with the Er concentration, and with the Er 5p3/2 and 5p1/2 levels at 26 and 32 eV binding energy respectively. We attribute the peak at 10.0±0.5 eV binding energy to the Er 4f level. These are the only occupied states that can be related to the presence of Er, indicating that these levels are not valence states and consequently can be treated as frozen core levels.

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Abstracta

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