

Abstracta

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Trabalhos Aceitos para Publicação

A038-97 à A040-97

Trabalhos Aceitos para Apresentação em Conferências

C012-97 à C015-97

Accepted papers

[A038.97] "Superconducting Fluctuations for 3D Anisotropic Superconductors in the Presence of a Magnetic Field With Arbitrary Direction"

J. M. Calero, J. C. Granada, E. Z. Silva

A nonperturbative method for evaluation of thermodynamic scaling functions in the critical region of type-II superconductors, appropriate for high temperature superconductors, is extended for the case of external magnetic fields with arbitrary angles with respect to the *c* axis for the case of 3D anisotropic superconductors. An explicit scaling function for the magnetization is presented, discussed and compared with experimental data from measurements with applied fields along the *ab* planes.

Physical Review B 56 (10), 6114-6119, 1997

[A039.97] "Informational Statistical Thermodynamics and Thermal Laser Stereolithography"

R. Luzzi, M. A. Scarparo, J. G. Ramos, A. R. Vasconcelos, M. L. Barros, Z. Zhiyao, A. Kiel

We consider the nonequilibrium thermodynamic aspects of the techno-industrial process of thermal laser stereolithography. The conditions necessary for a satisfactory process of rapid prototyping to follow are characterized and discussed. We show that the process is best described in terms of modern theories of nonequilibrium thermodynamics of dissipative systems. Nonconservative fluxes need be introduced as basic variables, quite in the spirit of extended irreversible thermodynamics, to explain the experimental results. We also show that by varying the thermal properties of the material, the restricted domain of validity of the traditional classical irreversible thermodynamics is reached: to have diffusive motion predominating over long-range-propagating undulatory motion is fundamental for the technique.

Journal of Non-Equilibrium Thermodynamics 22 (3), 197-216, 1997

[A040. 97] "Influence of the distribution of Magnetic Moments on the Magnetization and Magnetoresistance in Granular Alloys"

E. F. Ferrari, F. C. S. DA Silva, M. Knobel

In granular solids, the magnetoresistance is directly related to the macroscopic magnetization, but this relationship is extremely complex due to the distribution of grain sizes and the intergranular magnetic interactions. The dependence of the magnetoresistance on the magnetization is here investigated by means of a theoretical model that is developed taking explicitly into account the magnetic moment distribution and the spin-dependent electron impurity scattering within magnetic grains and at the interface between the grains and the metallic matrix. Using this model, one can explain large experimental deviations from the parabolic behavior of the magnetoresistance vs magnetization curves that are typically expected for equal noninteracting superparamagnetic grains. The expressions for the magnetization and magnetoresistance, obtained for general distribution functions, are tested considering a log-normal type distribution function by fitting on data obtained from melt spun $\text{Cu}_{90}\text{Co}_{10}$ ribbons after annealing by dc Joule heating. The experimental data are well traced using just three parameters that determine the particle size distribution, the particle density and the ratio of the scattering cross section at the boundaries of the grains to the scattering cross section within the grains.

Physical Review B 56 (10), 6086-6093, 1997

Accepted papers for conference presentation

[C012. 97] "The Sensitivity of the LVD Experiment to Characterize the Parameters of Neutrino Emission from Stellar Collapses"

E. Kemp, W. Fulgione, A. Turtelli, P. Galeotti

In liquid scintillation counters, such as the LVD experiment, it is possible to explore the features of the neutrino interactions in different channels to recover the neutrino emission parameters in the case of stellar collapses. In order to estimate the deviations between the calculated and expected experimental results, we have developed a simulation of these signals in the liquid scintillation counters, taking into account both statistical and experimental fluctuations. These deviations define the apparatus sensitivity as a function of the neutrino emission parameters.

In: 25th International Cosmic Ray Conference Durban, Africa do Sul, 28/07 a 08/08, may 1997

[C013.97] "Effects of Rock density Unhomogeneities in Muon Flux Underground"

F. Badino, W. Fulgione, E. Kemp, A. Turtelli

In this paper we discuss how the muon flux at great depths is affected by density unhomogeneities inside the surrounding material. Applying our assumptions we show under which conditions muons would carry information about the unhomogeneities they passed through. These assumptions were checked using a GEANT based simulation.

In: 25th International Conference on Cosmic Rays, v.1-7, Durban, South Africa, 28 Jul - 8 Aug 1997, 417-420 (v.6), may 1997

[C014.97] "Bonding Properties of RF-CO-Sputtering Amorphous Ge-C Films Studied by X-ray Photoelectron and Raman Spectroscopy"

J. Vilcarromero, F.C. Marques, J. Andreu

Hydrogenated amorphous germanium-carbon (a-GeCx:H) alloy films were prepared using the rf-co-sputtering technique in a argon plus hydrogen atmosphere. A series of films with carbon contents varying from 0 at.% to 100 at.% was prepared using the same conditions as those used to prepare good a-Ge:H films. The carbon content was determined using Rutherford Backscattering Spectroscopy. The bonding properties as a function of carbon content were characterized by x-ray photoelectron and micro-raman spectroscopy. The binding energy of the Ge 3d core electrons increases monotonically as the carbon content increases while the corresponding line-width remains almost constant. On the other hand, the curve of the C 1s core electrons binding energy versus carbon content displays a kink around $x = 0.3$. The raman data are analyzed over a wide frequency range of the Stokes scattering. The raman spectra show bands close to 80, 200 and 270 cm^{-1} associated with the TA, LA and TO-like modes of the Ge phonon vibrations, respectively. These modes were not observed in films with carbon content higher than 70 at.%. A "doublet" located at 1200 cm^{-1} and 1700 cm^{-1} was observed in films with carbon content in the 40 at.% to 100 at.% range, which were associated with the D and G bands.

In: 17th ICAMS, International Conference on Amorphous and Microcrystalline Semiconductors, Budapest, Hungary, 25-29 August, may 1997
Journal of Non-Crystalline Solids 227-230, Part 1, 427-431, Mai 1998

[C015.97] "A Hamiltonian for the generation of pure states of the light field"

A. Vidiella-Barranco, J. A. Roversi

We construct a Hamiltonian for the generation of arbitrary pure states of the quantized electromagnetic field. The proposition is based on the fact that a unitary transformation for the Fock states has been already found, making possible, in principle, the utilization of nonlinear media for their generation. As an example of this methodology, we discuss its applicability to the particular case of binomial state generation.

In: 5th International Conference on Squeezed States and Uncertainty Relations, Balatonfüred, Hungria, de 27-31 may de 1997. accepted on may de 1997

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Abstracta

Instituto de Física

Diretor: Prof. Eliermes Arraes Meneses

Universidade Estadual de Campinas - UNICAMP

Cidade Universitária Zeferino Vaz

13083-859 - Campinas - SP - Brasil

e-mail: secdir@ifi.unicamp.br

Fone: 0XX 19 3521 - 5300

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Biblioteca do Instituto de Física Gleb Wataghin
<http://webbif.ifi.unicamp.br>
Diretora Técnica: Rita Aparecida Sponchiado

Elaboração
Tânia Macedo Folegatti
abstract@ifi.unicamp.br

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