Abstracta

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Trabalhos Aceitos para Publicação

A050-97 à A065-97

Accepted papers

[A050.97] "On Deriving Force From Inductance"

M. Bueno, A. K. T. Assis

It is shown the correctness of calculating force on current carrying circuits by taking the derivative of the inductance coefficient of the circuits, even in the case of a single closed circuit, contrary to the opinion of some authors. This demonstration is illustrated with the force exerted by a cylinder with poloidal current on na infinitesimal strip belonging to the same cylinder. The force is calculated directly from the force expressions and also by differentiating the self-inductance of the cylinder. This result is another proof of the equivalence between Ampère and Grassmann's forces.

[A051.97] " Giant Magneto-Impendance and its Relaxation in Co-Fe-Si-B Amorphous Ribbons"

M. L. Sartorelli, M. Knobel, J. Schoenmaker, J. Gutierrez, J. M. Barandiarán

Systematic mearurements of giant magneto-impedance (GMI) and its relaxation (magneto-impedance aftereffect) have been carried out in a series of Co-rich amorphous ribbons ranging in magnetostriction values from -3.5 yo +3.5 ppm. The value of GMI is maximum for the alloys with the lowest value of magnetostriction, corresponding to a maxium of the transverse permeability. The impedance relaxation between two fixed rimes depends on the magnetostriction constant (l s) of the samples, and the observed trend is consistent with the theories which predict a direct relationship of the conventional permeability aftereffect (MAE) with the square of l s . Furthermore, the variation of the impedance aftereffect with the driving current resembles the behavior of MAE, and a connection between both effects can be established.

[A052.97] "Weighted Oscillator Strengths for Kr III Spectrum"

M. Ranineri, J. G. Reyna Almandos, F. Bredice, M. Gallardo, A. G. Trigueiros, S. G. Pettersson

The weighted oscillator strengths, gf, of more than 700 known and new spectral lines belonging to the 4s2 4p2, 4s4p5, 4s24p3 5p, and 4s2 4p3 (4d+5d+6d+5s+6s) transitions array in Kr III, were carried out in a Multiconfigurational Hartree-Fock relativistic approach. In this calculation, the electrostatic parameters were optimized by a least-square procedure, in order to improve the adjustment to experimental energy levels.

[A053.97] "On the Thermodynamics of Ionized Gases"

C. F. Xavier, G. M. Kremer

The transport coefficients of a completely ionized gas are determined from na extended thermodynamic theory of mixtures of ideal gases in the presence of external electromagnetic fields. The Onsager relations for the transport coefficients in the presence of external mangetic flux density are also discussed.

[A054.97] "Phase-Space Approach to the Tunnel Effect: a new Semiclassical Traversal Time"

A. L. Xavier Jr., M. A. A. de Aguiar

We determine the semiclassical coherent-state propagator for a particle going through one-dimensional evolution in a simple barrier potential. The described semiclassical method makes use of complex trajectories which, by its turn, enables the definition of (real) traversal times in the complexified phase-space. We then discuss the behavior of this time for a wave-packet whose average energy is below the barrier height.

[A055.97] "Thermodynamic Variables in the Context of a Nonequilibrium Statistical Ensemble Approach"

R. Luzzi, A. R. Vasconcellos, D. Jou, J. Casas-Vásquez

We consider the question of the definition of thermodynamic-like variables in the context of a statistical thermodynamics, which is a large generalization of Gibbs statistical thermostatics and linear and local-equilibrium classical irreversible thermodynamics. It is based on a nonequilibrium ensemble approach known as the nonequilibrium Statistical Operator Method. Some of these quasi-thermodynamic variables are characteristic of the nonequilibrium state and go to zero in the limit of local or global equilibrium, but others go over the thermodynamic variables that are present in such limit. We consider in particular temperature-like variables for the different subsystems of the sample. For illustration we apply the theory to the study of optical properties of highly photoexcited plasma in semiconductors, following a good agreement between theory and experimental data. It is shown that high-resolution spectroscopy provides na excellent experimental testing ground for corroboration of the theoretical concepts, and a quite appropriate way for characterizing and measuring nonequilibrium thermodynamic-like variables.

[A056.97] "Cumulant Expansion o the Periodic Anderson Model in Infinite Dimension"

M. E. Foglio, M. S. Figueira

The diagrammatic cumulant expansion for the periodic Anderson model with infinite coulomb repulsion (U = ¥) is considered here for na hypercubic lattice of infinite dimension (d = ¥). The near-est neighbor hopping of the uncorrelated electrons is described exactly by a conduction band, while two different models of hybridization are treated as a perturbation. The same type of simplifications obtained by Metzner for the cumulant expansion of the Hubbard model in the limit of d = ¥ , are shown to be also valid for the periodic Anderson model. The derivation fo these properties had to be modified because of the exact treatment of the conduction band.

[A057.97] "From the Atomic Systems to the Extended Ones: the hubbard operators"

M. E. Fóglio

It is sometimes convenient to emphasize the local aspects of a part of a crystalline system, and use the corresponding localized states to build a basis of the states of the whole system. In many cases it is only a subspace of these local states that is relevant, and the Hubbard operators provide a fairly simple way to write the corresponding projected Hamiltonian. Two examples of this type of treatment are presented in this work. The first is a Co2+ impurity in a MgO crystal interacting through a Jahn-Teller term with the crystal phonons, and it is shown how this interaction affects the electronic Raman scattering. The second is the Anderson lattice when the local electrons have an infinite Coulomb repulsion, and a diagrammatic expansion with cumulants is

discussed. We propose a method to obtain approximate Green's functions for the Anderson lattice that employs the exact solutions of an atomic problem, and the corresponding spectral density of the local electrons is calculated.

[A058.97] "Studies of the Collision-based Xe VI and Xe VII Spectra"

M. Wang, A. Arnensen, R. Hallin, F. Heijkenskjold, M. O. Larsson, A. V. Loginov, A. G. Trigueiros, A. Wännnström

Collison-based spectroscopy of a Xeq+ (q=6 and 7) beam with a target T (T+ Na and Ar) has been performed in the 35-800 nm wavelength region. Twenty-five new Xe VI lines and 22 new Xe VII lines were classified and 12 new energy levels of Xe VI and 9 new energy levels of Xe VII were established and one energy level of Xe Vi was revised from the classified transitions. The analysis was supported by Hartree-Fodk calculations.

[A059.97] "Causality Condition, Dispersion Relations and the Lorentz Model"

M. J. Menon and R. P. B. dos Santos

We discuss some aspects of the scientific methodology associated with the set up of connections between phenomenological results obtained through models and general principles (first principles) in field theory. Aiming to stress this kind of strategy to undergraduate students we consider an specific example taking as physical phenomena the electromagnetic wave propagation in dieletric medium, as phenomenological model the Lorenz oscilator model, as field theory of Classical Electrodynamics and as general principle of the theory, the Causality Principle. Presenting in some detail the caracteristics associated to causality, we demonstrate that specific model predictions are typical of general classes of physical systems which obey causality and linearity conditions.

[A060.97] "Multiple Diffraction Model for Proton-Proton Elastic Scattering and Total Cross Section Extrapolations to Cosmic-Ray Energies"

A. F. Martini, M. J. Menon.

We analyze pp elastic scattering data at the highest accelerator energy region (10 < Ö s £ 62.5 GeV) through a multiple diffraction approach. The use of Martin's formula in a model developed earlier is substituted by the introduction of a complex elementary (parton-parton) amplitude. With this the total cross section and the r parameter may be simultaneously investigated and, with the exception of the diffraction minimum at some CERN ISR energies, a satisfactory description of all experimental data is obtained. Total cross section extrapolations to cosmic-ray energies (Ö s > 6 TeV) show agreement with the reanalysis of the Akeno data performed by Nikolaev and also with Gaisser, Sukhatme, and Yodh results, leading to the prediction s r r tot(Ö s = 16 TeV) 147 mb. Physical interpretations and critical remarks concerning our parametrizations and results are also presented and discussed.

[A061.97] "Evidences for Eikonal Zeros in the Momentum Transfer Space"

P. A. S. Carvalho, M. J. Menon

We present the results of fitting elastic pp differential cross section data at 23.5 < V s < 62.5 GeV with a novel analytic parametrization for the scattering amplitude. Making use of a fitting method , the errors from the free parameters are propagated to the imaginary part of the eikonal in the momentum transfer space. It is also performed a novel systematic study of the effects coming from data at large momentum transfer. We found statistical evidences for the existence of eikonal zeros in the interval of momentum transfer 5-9 GeV2.

[A062.97] "Charge-Carriers Diffusion Lentgh in Photorefractive Crystals Computed From the Initial Hologram Phase Shift"

A. A. Freschi, P. M. Garcia, J. Frejlich

The phase shift between the pattern of light onto a photorefractive crystal and the resulting hologram at the very beginning of the recording process in two-wave mixing is analysed and measured as a function of the applied electric field. These data allow to compute the diffusion length of photoexcited charge-carriers and to evaluate the actual electric field inside the crystal. A diffusion length of 0.14 m m is measured in a nominally undoped photorefractive Bi12TiO20 crystal using a 532 nm wavelength laser illumination, in agreement with results obtained from other methods.

[A063.97] "Photorefractive Saturable Kerr-Type Nonlinearity in Photovoltaic Crystals"

S. Bian, J. Frejlich, K. H. Ringhofer

We deduce the equation describing the refractive index perturbation in photovoltaic photorefractive crystals produced by the incidence of a focused laser beam and an incoherent uniform illumination. Under short-circuit condicitons the equation shows a saturable Kerr-type nonlinearity that can be controlled by the intensity of the uniform background illumination. Z-scan experiments in an iron doped lithium niobate crystal are carried out using a 532 nm wavelength laser line to evaluate its self-lensing properties and to measure its photovoltaic field.

[A064.97] "Phase-Controlled Photorefractive Running Holograms"

A. A. Freschi, P. M. Garcia, J. Frejlich

We report the use of phase modulation in two-wave-mixing with negative feed-back to record stabilized photorefractive running holograms with arbitrarily fixed phase shift between the transmitted and the diffracted beams behind the crystal. By adequately choosing this phase one can select the running hologram speed and associated properties like diffraction efficiency. This technique is an alternative to the classical frequency detuning one with the advantage that the recording is at the same time actively stabilized referred to the own hologram being recorded. We describe the setup, analyse its behavior and report experimental results for a Bi12TiO20 crystal.

[A065.97] "The Effect of Rapid Thermal Annealing on the Microstructure and Electrical Characteristics of Au/Ni/Au/Ge/Ni Muiltilayers Deposited ON n - TYPE InGaAs"

J. Morais, T. A. Fazan, R. Landers, R. G. Pereira, E. A. S. Sato, W. Carvalho Jr.

The effect of rapid thermal annealing on the microstructure and contact resistance of Au/Ni/Ge/Ni multilayers deposited on InGaAS: Si layers was studied by Auger electron spectroscopy (AES) and the transmission line method (TLM) The reaction process at the interfaces after thermal annealing was monitored by Auger depth profiles (AES in conjunction with ion sputtering). We have observed that the formation of a NiGeAs layer at the interface plays an important role in obtaining contacts with low specific resistance, similar to GaAs. Based on these results, we have obained extremely low specific contact resistance, $(4 \pm 1) \times 10^{-8}$ W .cm2 , for annealing temperatures higher than 4000 C.

Last update: 14:27 14/10/97
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Nota: Arquivo gerado em nov/2011 tendo como base as informações da edição do Abstracta distribuída na época. O arquivo original não foi preservado.

Abstracta

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