Abstracta

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Trabalhos aceitos para publicação em periódicos

A 033 - 00 On Bogoliubov´s principle of correlation weakening.

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

Bogoliubov´s principle of correlation weakening, and the accompanying hierarchy of relaxation times, provides fundamental bases for the developement of nonequilibrium ensemble formalisms. A very promissing one is the so-called MaxEnt-NESOM. Within the framework of this formalism we analize the role, and validation, of Bogoliubov´s principle. We consider the case of the highly excited photoinjected double-plasma in polar semiconductors. it is shown that several kinetic stages on Bogoliubov´s sense can be characterized, accompanied by succesive contractions of the description of the macroscopic state of the system.

Ukrainian Journal of Physics, accepted on June 2000.

A 034 - 00 Periodic Anderson model from the atomic limit: optical conductivity of FeSi.

M. E. Foglio, M S. Figueira

The optical conductivity $\sigma(\varpi,T)$ can be obtained with the same approximations employed in a previous work to calculate the static conductivity $\sigma(T)$ and magnetic susceptibility $\chi(T)$ of FeSi, a compound that behaves like a Kondo insulator with both quantities vanishing rapidly for $T\rightarrow 0$; the periodic Anderson model (PAM) for $U\rightarrow\infty$ was employed to model FeSi, assuming that the systems is in the intermediate valence region. The same treatment is employed in the present work to describe the three properties for the same compound, and a fairly good agreement with the experimental results is obtained. The sum rule of $\sigma(\varpi,T)$, appropriate for the PAM, is well satisfied in the range of the experimentally measured temperatures. Some quantities derived from our results are of the same of magnitude that was estimated from recent measurements of angle-resolved low-temperature photoemission in FeSi.

Physical Review B , accepted on June 2000.

A 035 -00 Vibrational relaxation effects in hydrodynamic models for sonoluminescence.

Christiane Fernandes Xavier and Roberto Antonio Clemente

An hydrodynamic model for sonoluminescence in diatomic gases, taking into account vibrational relaxation effects is presented. Allowing for heat conduction at the bubble boundary and using the Gilmore approximation for the buble radius equation, it is possible to obtain different maximum gas temperatures associated to translational/rotational degrees of freedom and to vibrational ones. The difference in maximum temperatures should be negligible in the case of oxygen but is should reach large values in the case of nitrogen. This indicates that care should be taken when amounts of dissociation and/or amounts of ionization are estimated in sonoluminescence, starting from the thermodynamic equilibrium hypotheses. it may happen that the velocity of the bubble collapse is so high that such kinds of processes have no sufficient time to develop.

Journal of the Physical Society of Japan , accepted on June 2000.

A 036-00 Weighted oscillator strengths and lifetimes for the Si XI spectrum.

L. H. Coutinho and A. G. Trigueiros

The weighted oscillator strengths (gf) and the lifetimes presented in this work were carried out in a multiconfiguration Hartree-Fock relativistic (HFR) approach. In this calculation, the electrostatic parameters were optimized by a least-squares procedure, in order to improve the adjustment to experimental energy levels. This method produces gf-values that are in better agreement with intensity observations and lifetime values that are closer to the experimental ones. In this work we revised all the experimentally known electric dipole Si XI spectrum lines.

Journal of Quantitative Spectroscopy, accepted on May 2000.

A 037-00 Weighted oscillator strengths and lifetimes for the Si IV spectrum.

A. Siems, F. R. T. Luna, and A. G. Trigueiros.

The weighted oscillator strengths (*gf*) and the lifetimes for Si IV presented in this work were carried out in a multiconfiguration Hartree-Fock relativistic (HFR) approach. In this calculation, the electrostatic parameters were optimized by a least-squares procedure, in order to improve the adjustment to experimental energy levels. This method produces *gf*- values that are in better agreement with intensity observations and lifetime values that are closer to the experimental ones. In this work we presented all the experimentally known electric dipole Si XI spectral lines.

Journal of Quantitative Spectroscopy and Radiative Transfer, accepted on May 2000.

A 038-00 Weighted oscillator strengths and lifetimes for the neutral oxygen spectrum, O I.

I. V. L. Costa, G. H. Cavalcanti, and A. G. Trigueiros

The weighted oscillator strengths (*gf*) and the lifetimes for O I presented in this work were carried out in a multiconfiguration Hartree-Fock relativistic (HFR) approach. In this calculation, the electrostatic parameters were optimized by a least-squares procedure, in order to improve the adjustment to experimental energy levels. This method produces *gf*- values that are in better agreement with intensity observations and lifetime values that are closer to the experimental ones. In this work we present all the experimentally known electric dipole atomic transitions and energy levels for the O I spectrum.

Brazilian Journal of Physics, accepted on May 2000.

A 039-00 Spectroscopy analysis of the 4p4d configuration of Kr VII.

M. Raineri, A. G. Trigueiros, M. Gallardo, and J. G. Reyna Almandos

The spectrum of six times ionised krypton, (Kr VII), has been observed in the 300-2000 Å wavelength range. We propose 11 new energy level values for the 4p4d configuration and we adjusted the previously known energy level values for the 4s5p, 4s4f, 4s5s and 4s5d configurations. A total of 56 new lines in this spectrum have been classified. The observed configurations were theoretically interpreted by meams of Hartree-Fock relativistic, (HFR) calculations and least-squares fit of the energy parameters to the observed levels.

Physica Scripta, accepted on July 2000.

Trabalhos aceitos para publicação em livros

L 001- 00 Está a física chegando a seu fim?

Roberto Luzzi

A pergunta do título é recorrente através da história da Física. Porém, como a visão de Heisenberg e outros antecipara, estaríamos, pelo contrário, num regime de amplo crescimento da ciência em geral, voltando, em certo modo, ao ideal aristotélico de uma filosofia natural unificada.Exploraremos nesta apresentação o tema da complexidade nas Ciências Naturais, em particular no referente à relação com a suposta dicotomia entre microfísica e macrofísica. Mais especificamente, comentaremos o papel de um enfoque mecânico-estatístico por inferência (a Mecânica Estatística Preditiva de Jaynes) e suas aplicações em Hidrodinâmica, Física dos semicondutores e polímeros, e sistemas biológicos modelados.

Capítulo em livro: Fundamentos da Física: Simposio David Bohm, Ed. Livraria da Física, São Paulo, 1999.

ERRATA

TRABALHO ACEITO P/ PUBLICAÇÃO EM LIVRO - isto é:

LIVRO ACEITO PARA PUBLICAÇÃO:

L003 - 99 STATISTICAL FOUNDATIONS OF IRREVERSIBLE THERMODYNAMICS.

R. Luzzi, A.. R. Vasconcellos, J. G. Ramos

São considerados alguns aspectos da física de sistemas de muitos corpos arbitrariamente afastados do equilíbrio, basicamente sua caracterização e evolução irreversível do seu estado macroscópico. Descreve-se o status presente da termodinâmica irreversível fenomenológica, e é apresentada a construção de uma termodinâmica estatística - denominada de Termodinâmica Estatística Informacional -, baseada num formalismo de ensembles estatísticos de não equilíbrio. Este formalismo pode ser considerado como contido no arcabouço da assim chamada Mecânica Estatística Predictiva (introduzindo este anglicismo), na qual sua principal característica é a predição dos estados futuros em termos do conhecimento dos estados presentes e passados, e a questão da historicidade no caso de sistemas com comportamento complexo.

Livro em processo de impressão (no prelo), a ser publicado na Serie Texte zur Physik da Editora Teubner de Berlin, accepted on November 1999.

Abstracta

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