UDC 53(05)

ISSN 1330-0008
CODEN FIZAE4

FIZIKA A

A JOURNAL OF EXPERIMENTAL AND THEORETICAL PHYSICS

CLASSICAL PHYSICS
ATOMIC AND MOLECULAR PHYSICS
CONDENSED MATTER PHYSICS
PLASMA PHYSICS
TEACHING AND HISTORY OF PHYSICS

Recognized by the European Physical Society

Volume 15 2006 Numbers 1 – 4

Zagreb

Complete volume 15

online: http://fizika.phy.hr

Published by the Croatian Physical Society

Fizika A Vol. 15 Nos. 1 – 4 January – December 2006 pp. 1 – 250

FIZIKA A (Zagreb)
Printed issue:
ISSN 1330-0008
A JOURNAL OF EXPERIMENTAL AND THEORETICAL PHYSICS
Published by the Croatian Physical Society

Editor: K. Ilakovac, Faculty of Science, University of Zagreb
Associate Editors: K. Uzelac, Institute of Physics, Zagreb
D. Šokčević, "R. Bošković" Institute, Zagreb

Editorial Board

E. Babić
University of Zagreb,
Zagreb, Croatia

S. Barišić
University of Zagreb,
Zagreb, Croatia

R. Blinc
J. Stefan Institute &
University of Ljubljana,
Ljubljana, Slovenia

L. Colombo
R. Bošković Institute,
Zagreb, Croatia

J. R. Cooper
IRC in Superconductivity
University of Cambridge,
Cambridge, United Kingdom

A. Dulčić
R. Bošković Institute &
University of Zagreb,
Zagreb, Croatia

J. Friedel
Université Paris Sud,
Orsay, France

P. Fulde
Max-Planck-Institut für
Festkörperforschung,
Stuttgart, Germany

C. Rizzuto
Interuniv. Consortium
for the Physics of Matter,
Genova, Italy

M. Šunjić
University of Zagreb,
Zagreb, Croatia

Subscription rate per volume of Fizika A (one printed issue per year incl. CD-ROM): For Croatia: Members of the Croatian Physical Society 50 HRK, institutions 200 HRK; foreign orders $ 50 plus postal charges. Fizika A & B one volume, CD-ROM only, $ 15 plus postal charges.

Correspondence and/or calls regarding submission of manuscripts, enquiries, proofs, subscriptions, renewals, address changes and missing or damaged copies address to:

Editorial Office, Fizika, Bijenička 32, HR-10000 Zagreb, Croatia
Tel. +385-1-4680055, Fax. +385-1-4480336, E-mail: ilakovac@phy.hr

Payments should be made by bank transfer, check or bank money order.
Payments in HRK should be made to bank account no. 30102–678–4202
Payments in foreign currency should be made
– bank transfer to ZBZ dd SWIFT ZABA HRXX, account no. 25731-32 39 853 (HFD)
– checks should be sent to the Editorial Office, the payment to:
The Croatian Physical Society, account no. 25731-32 39 853.

The journal Fizika A (Zagreb) is financially supported by the Ministry of Science Education and Sports of the Republic of Croatia

The journal Fizika A (Zagreb) is abstracted/indexed by:
ALUMINIUM IND. ABS., ENERGY SCITEC, GEOREF, INSIDE CONFERENCES, INSPEC, MATHSCI(R), NUCLEAR SCI. ABS., PASCAL and UNCOVER

Fizika A (Zagreb) is available online (URL: http://fizika.phy.hr) and on CD-ROM.
CD-ROM editions of Fizika A (Zagreb) Vol. 6 (1997) and further issues are available.

Copyright © Croatian Physical Society

CONTENTS, FIZIKA A, VOLUME 15 (2006)

Note: The page numbering of articles is done when articles are ready for publication and placed online on Fizika web pages. In these Contents, the articles are rearranged according to the branches of physics represented in the journal. Therefore, page numbering is not consecutive.

First part (first six articles) of this volume are dedicated to the memory of Professor Zvonko Ogorelec

CONDENSED MATTER PHYSICS

S. Sabolek, E. Babić, I. Kušević, M. Šušak, D. Posedel and D. Stanić: The origin of the surface field enhanced coercive field in nanophase $Fe_{73.5}Cu_1Nb_3Si_{15.5}B_7$ ribbon 1

I. Kokanović, B. Leontić and J. Lukatela: Superconducting properties of thermally-relaxed $Zr_{80}Co_{20}$ metallic glass 17

B. Babić, M. Basletić, A. Dulčić and M. Požek: Depolarization crossovers in the microwave response of silicon crystals in slab geometry 25

I. Djerdj, A. Tonejc, A. Tonejc and N. Radić: On the applicability of different methods of XRD line profiles analysis in estimating grain size and microstrain in tungsten thin films 35

Ž. Bihar, A. Bilušić, A. Smontara and J. Dolinšek: Thermal conductivity of Al-Cr-Fe approximant compounds 51

Ž. Skoko and S. Popović: Temperature dependence of microstructure of $(1-x)$Al-xZn alloys, $x = 0.44$, 0.48, 0.54 and 0.62 61

CLASSICAL PHYSICS

Shi Liangma, Han Jiahua and Cheng Liang: Improved truncated expansion method and new exact solutions of the general variable-coefficent KdV equation 84

CONDENSED MATTER PHYSICS

E. A. Mehanna, A. S. Gerges and M. A. Hassouba: Characterization of step index optical fibers using two-beam interferometric method 125

M. M. El-Nahass, A. M. Farid, A. A. Attia and H. A. M. Ali: Structural properties and UV to NIR absorption spectra of metal-free phthalocyanine (H_2Pc) thin films 147

P. B. Thakor, P. N. Gajjar and A. R. Jani: Different reference systems in the study of structural properties of some simple liquid metals 165

Shazia Bashir, M. S. Rafique, M. Khaleeq-ur-Rahman, Faizan-ul-Haq and B. R. Alvina: CO_2 and Nd:YAG laser radiation induced damage in aluminium 181

H. H. Hassanien, S. S. Abdelmoly and N. ElMeshad: Exact solution of finite parabolic potential disc-like quantum dot with and without electric field 209

R. Djelti, S. Bentata and Z. Aziz: Éffet d'un trimer en hauteur de barrière sur la nature des états électroniques du superréseau GaAs/Al_xGa_{1-x}As 219

S. Abouelhassan and H. A. Hashem: Non-isothermal crystallization kinetics of $Sb_{10}Ge_{10}Se_{80}$ chalcogenide glass 237

ATOMIC AND MOLECULAR PHYSICS

N. H. Abdel–Wahab, Magdy E. Amin and M. Taha: One-mode interaction with a four-level atom in a momentum eigenstate 113

Smail Bougouffa: The study of atomic transitions by use of Numerov technique in schematic model 193

Bibhas K. Dutta and Prasanta K. Mahapatra: Study of velocity-dependent collision effects on Lamb dip and crossover resonances in three-level system 227

PLASMA PHYSICS

TEACHING AND HISTORY OF PHYSICS

S. Pašić, O. Gamulin and Z. Tocilj: A simple experimental checking of Heisenberg's uncertainty relations 73

M. Perc: Introducing nonlinear time series analysis in undergraduate courses 91

J. J. Bevelacqua: Curvature systematics in general relativity..... 133

Authors are advised to consult "Instructions for Authors" on Fizika web pages at `http://fizika.phy.hr` before starting preparations of the manuscript for submission for publication in Fizika A.

INSTRUCTIONS

Fizika A is a journal publishing the results of original experimental and theoretical research work in classical physics, atomic and molecular physics, condensed matter physics, plasma physics and teaching and history of physics.

Contributions written in English, French, German or Russian are accepted. They should be submitted in duplicate, typed on good quality paper on one side only, with double spacing and wide margins, with original drawings of figures and one further copy of the title and abstract in English if the original is in a different language. The abstract should not exceed 600 letters including all symbols.

The front page of each manuscript should include the title of the paper, author's full name(s), affiliation(s) with full adress(es) and preferably the UDC and PACS classification numbers. To speed up communication, authors are encouraged to provide e-mail adress, FAX and telephone numbers. Unless requested othervise, the e-mail address and/or FAX number will be published with the author's address.

International system of units (SI) should be used whenever possible, particularly in quoting final results and in table and figure inscriptions.

The figures should preferably be produced by a laser printer on good-quality white paper or drawn in Indian ink on tracing paper. Figures should be fully lettered. Black and white photographs on glossy paper with high contrast are accepted. Reduction to about 1/3 of the original size is usually used. The lettering in the figures must be large enough to make the final size at least 1.5 mm high. All figures should be numbered consecutively with Arabic numerals in order of appearance in the text, and each should have a descriptive caption.

Each table should be numbered sequentially and should have a descriptive caption.

References should be numbered consecutively with Arabic numbers in square brackets. In the text the abbreviation et al. should not be used for papers written by two authors. All references should be listed on a separate sheet and **should include the names of all authors**. (Except for very large collaborations of more than about 10 authors.) The references should be written using the following style: [5] S. Smith and J. K. Jones, Phys. Rev. **295** (1972) 422.

Equations should be written carefully and clearly and numbered sequentially on the right-hand side. Special care should be paid to all symbols that can be misread, confused or are ambiguous (e.g. to distinguish between subscripts and superscripts). Please add a note in the margin to avoid such ambiguities or to explain special symbols.

The footnotes should be numbered in Arabic superscripts and placed at the bottom of the page in which they appear in the manuscript.

When typing the manuscript, authors are strongly advised to consult recent issues of Fizika.

A shorter paper, not subdivided into sections, of less than 600 words in length, with a modest number of illustrations and a short abstract, should be submitted as "Letter to the Editor".

For refereeing purposes only, papers including figures may also be sent by FAX. After the paper has been accepted for publication, the author(s) will be advised to send two original copies, including figures, to the Editor for further processing.

To speed up the publication, the authors of accepted papers are encouraged to send a source file of their papers in standard LaTeX(style "article") or in plain TeXwithout any author-defined styles and/or macros, and figures in PostScript format. This can be done by electronic mail or on a floppy disc (MS-DOS). Please read "Instructions for Authors" on our home pages.

When submitting a paper, the authors should include a covering letter, signed by one of the authors, clearly requesting publication of the paper in the journal Fizika.

The submission of the paper will be taken to imply that no copyright will thereby be infringed.

There is no page charge for publication of papers and authors are entitled to 30 free reprints.

The manuscripts of papers accepted for publication are not returned.

Manuscripts for publication and all correspondence should be sent to: The Editor, Fizika, Bijenička c. 32, HR-10000 Zagreb, CROATIA. FAX +385-1-4680 336 or +385-1-4680 055, e-mail: ilakovac@phy.hr.

SERVICE FOR THE READERS OF THE JOURNALS FIZIKA A & B

The contents and abstracts of Fizika A and Fizika B since 1992 (in hypertext) and full articles since 1997 (in ps and pdf formats) are available on the computer network Internet. They can be accessed by using the following URL of our home pages:

http://fizika.phy.hr/ or http://www.fizika.hfd.hr/