

Space Plasma Physics

Proceedings of the 4th School and Workshop on Space
Plasma Physics

Albena, Bulgaria

19-26 August 2012

Editors

Ivan Zhelyazkov

Todor Mishonov

St. Clement of Ohrid University at Sofia, Bulgaria

All papers have been peer reviewed.

Sponsoring Organizations

Sveti Sedmochislenitsi-08 Foundation

(Sts. Cyril and Methodius and their Five Disciples Foundation-08)

St. Clement of Ohrid University at Sofia



Melville, New York, 2013
AIP Proceedings

Volume 1551

Editors

Ivan Zhelyazkov

Todor Mishonov

St. Clement of Ohrid University at Sofia
Faculty of Physics
5 James Bourchier Blvd.
BG-1164 Sofia
Bulgaria
E-mail: izh@phys.uni-sofia.bg
tmishonov@phys.uni-sofia.bg

Authorization to photocopy items for internal or personal use, beyond the free copying permitted under the 1978 U.S. Copyright Law (see statement below), is granted by the AIP Publishing LLC for users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$30.00 per copy is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923, USA: <http://www.copyright.com>. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Services is: 978-0-7354-1176-0/13/\$30.00



© 2013 AIP Publishing LLC

No claim is made to original U.S. Government works.

Permission is granted to quote from the AIP Conference Proceedings with the customary acknowledgment of the source. Republication of an article or portions thereof (e.g., extensive excerpts, figures, tables, etc.) in original form or in translation, as well as other types of reuse (e.g., in course packs) require formal permission from AIP Publishing and may be subject to fees. As a courtesy, the author of the original proceedings article should be informed of any request for republication/reuse. Permission may be obtained online using RightsLink. Locate the article online at <http://proceedings.aip.org>, then simply click on the RightsLink icon/“Permissions/Reprints” link found in the article abstract. You may also address requests to: AIP Publishing Office of Rights and Permissions, Suite 1N01, 2 Huntington Quadrangle, Melville, NY 11747-4502, USA; Fax: 516-576-2450; Tel.: 516-576-2268; E-mail: rights@aip.org.

ISBN 978-0-7354-1176-0
ISSN 0094-243X
Printed in the United States of America

AIP Conference Proceedings, Volume 1551
Space Plasma Physics
Proceedings of the 4th School and Workshop on Space Plasma Physics

Table of Contents

| | |
|---|----|
| Preface: Space Plasma Physics I. Zhelyazkov and T. M. Mishonov | 1 |
| Acknowledgment | 2 |
| I. ASTROPHYSICAL PLASMAS AND GALAXIES | |
| Plasma conditions in different emitting regions of active galactic nuclei L. Č. Popović and D. Ilić | 3 |
| New magnetohydrodynamic model for close binary stars: Applicability for moderate magnetic fields A. G. Zhilkin, D. V. Bisikalo, and V. A. Ustyugov | 22 |
| Symbiotic stars with similar line profiles during activity N. A. Tomov, M. T. Tomova, and D. V. Bisikalo | 30 |
| On the possible nature of Be/X X-ray luminosity P. V. Kaygorodov, D. V. Bisikalo, D. A. Kononov, and D. V. Boneva | 46 |
| Bow shocks in disks of young binary systems A. Fateeva, D. V. Bisikalo, P. V. Kaygorodov, and A. Yu. Sytov | 53 |
| Gasdynamical study of close binary stars with elliptic orbits A. Yu. Sytov | 59 |
| Spectroscopic observations and Doppler tomography of the short-period cataclysmic variable star V455 And D. A. Kononov, D. V. Bisikalo, V. B. Puzin, A. G. Zhilkin, and A. Yu. Sytov | 67 |
| The disk(s) of the Milky Way J. Concejo, O. Stanchev, and Ts. B. Georgiev | 72 |
| Mass distribution of galaxies from CALIFA 2D stellar kinematic maps: Circular velocities and dark matter fractions V. Kalinova, G. van de Ven, M. Lyubenova, J. Falcón-Barroso, and R. Läsker | 84 |
| Non-circular motion estimation of the grand-design spiral galaxy NGC 628 D. Colombo | 92 |

| | |
|---|----|
| Analysis of stellar variability based on polynomial fittings of its light curve Ts. B. Georgiev | 98 |
|---|----|

| | |
|--|-----|
| Self-sustained turbulence in a magnetized shear flow Z. D. Dimitrov and T. M. Mishonov | 107 |
|--|-----|

II. SOLAR PLASMA

| | |
|---|-----|
| Solar eruptive phenomena B. Filippov, S. Koutchmy, O. Martsenyuk, and Y. Platov | 117 |
|---|-----|

| | |
|--|-----|
| Coupling between the solar interior and atmosphere B. Pintér | 129 |
|--|-----|

| | |
|---|-----|
| Self consistent 1D numerical calculation of the temperature profile of solar corona heated by Alfvén waves R. V. Topchiyska, N. I. Zahariev, and T. M. Mishonov | 135 |
|---|-----|

| | |
|---|-----|
| Kelvin-Helmholtz instability of kink waves in photospheric, chromospheric, and X-ray solar jets I. Zhelyazkov | 150 |
|---|-----|

III. SOLAR CYCLE PHENOMENA

| | |
|--|-----|
| The technical analysis of the stock exchange and physics: Japanese candlesticks for solar activity C. Dineva and V. Atanasov | 165 |
|--|-----|

| | |
|---|-----|
| Models of galactic cosmic-ray spectrum during the solar cycle M. Buchvarova and D. Draganov | 170 |
|---|-----|

| | |
|--|-----|
| Solar impact on global climate changes Y. Shopov | 179 |
|--|-----|

| | |
|--------------------|-----|
| Photographs | 189 |
|--------------------|-----|

| | |
|-----------------------------|-----|
| List of Participants | 198 |
|-----------------------------|-----|

| | |
|---------------------|-----|
| Author Index | 199 |
|---------------------|-----|