

JOURNAL OF
**PLASMA
PHYSICS**

journals.cambridge.org/pla

VOLUME 78 • PART 1 • FEBRUARY 2012

CAMBRIDGE
UNIVERSITY PRESS

EDITOR

PROFESSOR PADMA KANT SHUKLA, *RUB International Chair, Fakultät für Physik und Astronomie, Ruhr-Universität Bochum, D-44780 Bochum, Germany, profshukla@yahoo.de*

ASSOCIATE EDITORS

Professor K AVINASH, *Department of Physics and Astrophysics, University of Delhi, Delhi-7, India, akhare@physics.du.ac.in, and Center for Space Plasma and Aeronomic Research (CSPAR), University of Alabama, Huntsville AL 35899, USA, ak0005@uah.edu*

Professor ROBERT BINGHAM, *Space Science & Technology Department, Rutherford Appleton Laboratory, Chilton, Didcot, Oxfordshire, OX11 0QX, United Kingdom, bob.bingham@stfc.ac.uk*

Dr ANTOINE C BRET, *Universidad Castilla la Mancha, School of Industrial Engineering, Avda Camillo Jose Cela, s/n 13 071 Ciudad Real, Spain, antoineclaude.bret@uclm.es*

Professor GERT BRODIN, *Department of Physics, Umeå University, S-90187 Umeå, Sweden, Gert.Brodin@physics.umu.se*

Professor NATHANIEL J FISCH, *Department of Astrophysical Sciences, Princeton Plasma Physics Laboratory, James Forrestal Campus, Princeton University, Princeton, NJ 08543, USA, fisch@princeton.edu*

Professor VLADIMIR E FORTOV, *Joint Institute for High Temperature, Russian Academy of Sciences, Izhorskaya 13 bld 2, 125412 Moscow, Russia, fortov@fjcp.ac.ru*

Professor CHAN JOSHI, *University of California, Department of Electrical Engineering, Los Angeles, USA, joshi@ee.ucla.edu*

Professor JOSE TITO MENDONÇA, *GoLP/Instituto Superior Tecnico, Department of Physics, University of Lisbon, 1049-001 Lisboa, Portugal, titomend@ist.utl.pt*

Professor ROBERT L MERLINO, *Department of Physics and Astronomy, The University of Iowa, Iowa City, IA 52242, USA, robert-merlino@uiowa.edu*

Dr PETER H YOON, *Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, USA, yoonp@umd.edu*

Dr John P Dougherty, Founding Editor, 1967–1994

Journal of Plasma Physics (ISSN 0022-3778) is published six times a year in February, April, June, August, October and December, by Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK and Cambridge University Press, 32 Avenue of the Americas, New York, N.Y. 10013-2473, USA.

Six parts form a volume. The subscription price (excluding VAT, but including postage) of Volume 78 (2012) is £1092 (US \$2021 in the USA, Canada and Mexico) for institutions print and electronic, institutions electronic only £1028/\$1722; £328 (US \$563) print only for individuals. All orders must be accompanied by payment.

EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number.

Japanese prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Prices include delivery by air.

Copies of the journal for subscribers in the USA, Canada and Mexico are sent by air to New York to arrive with minimum delay. Periodicals postage paid at New York, NY, and at additional mailing offices. *POSTMASTER*: send address changes in USA, Canada and Mexico to *Journal of Plasma Physics*, Cambridge University Press, 100 Brook Drive, West Nyack, New York 10994–2133.

Internet access This journal is included in the Cambridge Journals Online service, which can be found at journals.cambridge.org For further information on other Press titles, access <http://www.cambridge.org>

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the World's forests. Please see www.fsc.org for more information.

Printed in the United Kingdom, by the University Press, Cambridge

© Cambridge University Press 2012