

PHYSICAL REVIEW D

covering particles, fields, gravitation, and cosmology

Editors

ERICK J. WEINBERG URS M. HELLER

Associate Editors

ANSAR FAYYAZUDDIN ROBERT D. PISARSKI RASHMI RAY JOSHUA SAYRE ALIN TIRZIU
ROBERT WIMMER

Senior Editorial Assistant

MARIA POKO

EDITORIAL BOARD

Term ending 31 March 2020

HEINRICH PÄS
LAURA REINA
BERNARD F. WHITING

Term ending 31 December 2020

RAPHAEL BOUSSO
AIDA X. EL-KHADRA
YOUNG-KEE KIM
ERIC POISSON

Term ending 31 December 2021

JAMES M. CLINE
GERALD V. DUNNE
SCOTT A. HUGHES

American Physical Society

President PHILIP H. BUCKSBAUM
Speaker of the Council ANDREA J. LIU
Chief Executive Officer KATE P. KIRBY
Editor in Chief MICHAEL THOENNESSEN
Publisher MATTHEW SALTER
Chief Information Officer MARK D. DOYLE
Chief Financial Officer JANE HOPKINS GOULD
Deputy Executive Officer and
Chief Operating Officer JAMES TAYLOR
Chief Government Affairs
Officer FRANCIS SLAKEY
Chief Human Resources
Officer BETH GUNZEL

One Physics Ellipse
College Park, MD 20740-3844

APS Editorial Office

Directors

Journal Operations CHRISTINE M. GIACCONE
Information Systems PAUL DLUG

1 Research Road
Ridge, NY 11961-2701
Phone: (631) 591-4040
Email: prd@aps.org
Web: <https://journals.aps.org/>
Submissions: <https://authors.aps.org/Submissions/>

Member Subscriptions:

APS Membership Department

One Physics Ellipse
College Park, MD 20740-3844
Phone: (301) 209-3280 Fax: (301) 209-0867
Email: membership@aps.org

Institutional Subscriptions:

APS Subscription Services

P.O. Box 41
Annapolis Junction, MD 20701
Toll free: (888) 339-9655
Phone: (301) 617-7809 Email: subs@aps.org

Manuscripts should be submitted electronically in acceptable format (see <http://authors.aps.org/Submissions/>). Submission is a representation that the manuscript has not been published previously and is not currently under consideration for publication elsewhere. An executed APS **copyright-transfer** form must be provided (effective only on acceptance for publication). Information for Contributors and a description of editorial Policies and Practices can be found at <http://journals.aps.org/prd/authors>.

To help defray editorial and production expenses, authors of manuscripts which are not submitted in acceptable electronic format are expected to pay a **publication charge** of \$1620/article, \$1010/Rapid Communication, \$370/Comment or Reply. Acceptable formats are REV_TE_X (preferred), L^AT_EX, plain T_EX; MS Word; PostScript figures (preferred). **Reprints** are offered for sale to authors.

For additional information regarding the online version of this journal, please visit: <http://journals.aps.org/prd>. Institutional subscribers requesting address changes, filing claims, or requesting additional information, please contact the APS Services at subs@aps.org. Member subscribers requiring changes, claims or additional information should contact the APS Membership Department at membership@aps.org.

Copyright © 2020 American Physical Society. All rights reserved.

*Physical Review D*TM is a trademark of the American Physical Society, registered in the United States, Canada, European Union and Japan.

Rights and Permissions: <http://journals.aps.org/copyrightFAQ.html>

Copying: No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the publisher, except as stated below. Single copies of individual articles may be made for private use or research. Authorization is given to copy articles beyond the use permitted by Sections 107 and 108 of the U.S. Copyright Law, provided the copying fee of \$25.00 per copy per article is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA.

Reproduction of an entire article in a reprint collection, or for advertising or promotional purposes, or republication in any form requires permission from APS. Permission must be sought via Aptara's SciPrisTM platform. To request permission to republish, refer to the Reuse and Permissions link that can be found on each APS article page and provide the requested information.

Other Use: Permission is granted to quote from the journal with the customary acknowledgment of the source. Permission must be sought using Aptara's SciPrisTM platform. To request permission to reproduce a figure, table, or excerpt of an article refer to the Reuse and Permissions link that can be found on each APS article page and provide the requested information. Authorization for private use or research does not extend to systematic or multiple reproduction, to copying for promotional purposes, to distribution in any format, or to republication in any form. In all such cases, specific permission from APS must be obtained.

Physical Review D Particles, Fields, Gravitation, and Cosmology [ISSN: 2470-0010 (print), 2470-0029 (online); CODEN PRVDAQ; printed in USA] is published twice a month by the American Physical Society, 1 Research Road, Ridge, NY 11961-2701.