PROCEEDINGS OF SPIE

Superconductivity and Particle Accelerators 2018

Dariusz Bocian Ryszard S. Romaniuk Editors

27–29 November 2018 Kraków, Poland

Organized by The Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences (Poland)

Published by SPIE

Volume 11054

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Superconductivity and Particle Accelerators 2018*, edited by Dariusz Bocian, Ryszard S. Romaniuk, Proceedings of SPIE Vol. 11054 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510627833

ISBN: 9781510627840 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)· Fax +1 360 647 1445

SPIE.org

Copyright © 2019, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/19/\$18.00.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.



Paper Numbering: Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

V	Authors
vii	Symposium Committees
xi	Introduction
	SYMPOSIUM OVERVIEW
11054 02	Superconductivity and particle accelerators 2018: SPAS'2018 conference overview (Invited Paper) [11054-1]
11054 03	Development of particle accelerator technology in Europe: digest of infrastructural and research projects (Invited Paper) [11054-2]
	LARGE ACCELERATORS AND RESEARCH INFRASTRUCTURES
11054 04	The day after LHC: electron-positron colliders are marching on (Invited Paper) [11054-5]
11054 05	Polish free electron laser: short technical description (Invited Paper) [11054-35]
11054 06	Progress towards continuous wave operation of the SRF Linac at DESY (Invited Paper) [11054-7]
11054 07	Polish contribution to final beam dynamic calculations for accelerator system analysis in the Early Neutron Source project [11054-11]
11054 08	Development of cryogenic test infrastructure at IFJ PAN [11054-15]
11054 09	Thermal-hydraulic analysis of the upgraded EU-DEMO CS1 coil [11054-27]
11054 0A	IFJ PAN contribution to the ESS: radio frequency distribution system, power converters installation, and cryomodule tests (Invited Paper) [11054-18]
11054 OB	IFJ PAN's contribution to the HL-LHC: construction of the superconducting links [11054-25]
11054 OC	IFJ PAN's contribution to the HL-LHC: crab cavities and RF [11054-28]
11054 0D	IFJ PAN's contribution to the HL-LHC: DQW crab cavity preparation and testing at CERN

BASIC RESEARCH ON MATERIALS AND COMPONENTS

11054 0E	Modelling of the influence of heavy ions irradiation on the current-voltage characteristics of the HTc superconducting tapes subjected to the bending strain process (Invited Paper) [11054-6]
11054 OF	Superconducting single-photon detectors as smart sensors [11054-34]
11054 0G	Numerical study of thin superconducting plates subjected to transverse magnetic fields [11054-9]
11054 0H	Infiltration growth processing of bulk mixed REBa $_2$ Cu $_3$ O $_{7-x}$ superconductors: nano-metal oxides and rare earth elements effects on microstructural properties [11054-10]
11054 OI	Improved superconducting performance of Ag-added nano-diamond doped MgB ₂ [11054-13]
11054 OJ	Physico-chemical properties of ceramic high-temperature superconductors with an approximate average radius of rare earth ion(-s) obtained by a solid-state synthesis reaction [11054-32]
11054 OK	Critical currents and critical temperatures of oxygenated TI-2223 bulk superconductors [11054-31]
11054 OL	Studies of oxygen superconductors REBa $_2$ Cu $_3$ O $_{7-\delta}$ (where RE rare earth) using an EPR method [11054-8]
11054 OM	From two types of electrostatic position-dependent semiconductor qubits to quantum universal gates and hybrid semiconductor-superconducting quantum computer [11054-14]
11054 ON	The microstructure and dielectric properties of a solid solution (1-x) $K_{0.5}Bi_{0.5}TiO_3$ - xSrTiO ₃ for x=0.001 ceramics [11054-3]