

17th International Conference on Calorimetry in Particle Physics (CALOR 2016)

Journal of Physics: Conference Series Volume 928

Daegu, South Korea
15 – 20 May 2016

ISBN: 978-1-5108-5312-6
ISSN: 1742-6588

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2016) by the Institute of Physics
All rights reserved. The material featured in this book is subject to
IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Table of contents

Volume 928

**17th International Conference on Calorimetry in Particle Physics (CALOR2016)
15–20 May 2016, Daegu, South Korea**

**Accepted papers received: 8 November 2017
Published online: 27 November 2017**

Preface

[17th International Conference on Calorimetry in Particle Physics \(CALOR2016\)](#)

[International Advisory Committee](#)

[Peer review statement](#)

Papers

1. Opening Session and Invited talk

[Seventy Years of Calorimetry](#)

Richard Wigmans.....1

2. Large Hadron Collider

[ATLAS Tile calorimeter calibration and monitoring systems](#)

Arthur Chomont on behalf of the ATLAS collaboration.....11

[ATLAS Tile Calorimeter time calibration, monitoring and performance](#)

T Davidek on behalf of the ATLAS Collaboration.....15

[The CMS Calorimeter Trigger for LHC Run II](#)

Dr. Aaron Bundock.....20

[Overview of Energy Reconstruction, and Electron and Photon Performances with the CMS ECAL in Run II](#)

Rafael Teixeira de Lima on behalf of the CMS Collaboration.....24

[Study of TileCal Scintillator Irradiation using the Minimum Bias Integrators](#)

Cora Fischer on behalf of the ATLAS Collaboration.....28

[The role of the CMS electron and photon trigger in the study of the Higgs boson and high mass searches](#)

Thomas Strebler On behalf of the CMS Collaboration.....33

[The performance of the CASTOR calorimeter during LHC Run 2](#)

Merijn H. F. van de Klundert on behalf of the CMS collaboration.....37

3.Experience with current calorimetric systems

[The NA62 Hadron Calorimeter](#)

Riccardo Aliberti.....41

[Geometric alignment of the SND detector](#)

A.A. Korol and N.A. Melnikova.....46

[Calorimetry of the CMD-3 detector](#)

R R Akhmetshin, A V Anisenkov, V M Aulchenko, N S Bashtovoy, D A Epifanov, L B Epshteyn, A L Erofeev, A A Grebenuk, D N Grigoriev, V F Kazanin, O A Kovalenko, A N Kozyrev, A E Kuzmenko, A S Kuzmin, I B Logashenko, K Yu Mikhailov, V S Okhapkin, G P Razuvaev, A A Ruban, V E Shebalin, B A Shwartz, V M Titov, A A Talyshev and Yu V Yudin.....50

[Status of the Top and Bottom Counting Detectors for the ISS-CREAM Experiment](#)

J.M. Park on behalf of the ISS-CREAM Collaboration.....54

4. Calorimetric systems at non-accelerator

[CaloCube: an innovative homogeneous calorimeter for the next-generation space experiments](#)

L. Pacini, O. Adriani, A. Agnesi, S. Albergo, L. Auditore, A. Basti, E. Berti, G. Bigongiari, L. Bonechi, S. Bonechi, M. Bongi, V. Bonvicini, S. Bottai, P. Brogi, G. Cappello, G. Carotenuto, G. Castellini, P.W. Cattaneo, M. Chiari, N. Daddi, R. DAlessandro, S. Detti, M. Fasoli, N. Finetti, P. Lenzi, P. Maestro, P.S. Marrocchesi, M. Miritello, N. Mori, G. Orzan, M. Olmi, P. Papini, M.G. Pellegriti, F. Pirzio, A. Rappoldi, S. Ricciarini, P. Spillantini, O. Starodubtsev, F. Stolzi, J.E. Suh, A. Sulaj, A. Tiberio, A. Tricomi, A. Trifirò, M. Trimarchi, E. Vannuccini, A. Vedda, G. Zampa and N. Zampa.....58

5. Calorimeters for future accelerator experiments

[Status and New Results for the sPHENIX Calorimeter Systems](#)

C. Woody for the sPHENIX Collaboration.....63

[A Very Compact Crystal Shashlik Electromagnetic Calorimeter for Future HEP Experiments](#)

Ren-Yuan Zhu.....67

[Precision Timing with shower maximum detectors based on pixelated micro-channel plates](#)

A Bornheim, A Apresyan, A Ronzhin, S Xie, M Spiropulu, J Trevor, C Pena, F Presutti and S Los.....71

[Design, status and test of the Mu2e crystal calorimeter](#)

N. Atanov, V. Baranov, J. Budagov, R. Carosi, F. Cervelli, F. Colao, M. Cordelli, G. Corradi, E. Dané, Y. I. Davydov, S. Di Falco, S. Donati, R. Donghia, B. Echenard, K. Flood, S. Giovannella, V. Glagolev, F. Grancagnolo, F. Happacher, D. G. Hitlin, M. Martini, S. Miscetti, T. Miyashita, L. Morescalchi, P. Murat, G. M. Piacentino, G. Pezzullo, F. Raffaelli, A. Saputi, I. Sarra, F. Spinella, G. Tassielli, V. Tereshchenko, Z. Usubov and R. Y. Zhu.....75

[Polarimetry concept based on heavy crystal hadron calorimeter](#)

I Keshelashvili, F Müller, D Mchedlishvili on behalf of JEDI collaboration.....79

[LYSO crystal testing for an EDM polarimeter](#)

F Müller, I Keshelashvili, D Mchedlishvili for the JEDI collaboration.....83

[Precision Timing with Silicon Sensors for Use in Calorimetry](#)

A Bornheim, A Ronzhin, H Kim, G Bolla, C Pena, S Xie, A Apresyan, S Los, M Spiropulu and E Ramberg.....87

[Electromagnetic calorimeter of the Belle II detector](#)

B. Shwartz on behalf of BELLE II calorimeter group.....91

[Status of the electromagnetic calorimeter trigger system at Belle II.](#)

SungHyun Kim, InSoo Lee, Yuuji Unno and ByungGu Cheon.....95

[LYSO based precision timing calorimeters](#)

A Bornheim, A Apresyan, A Ronzhin, S Xie, J Duarte, M Spiropulu, J Trevor, D Anderson, C Pena and M H Hassanshahi.....99

6.High Luminosity LHC

[Upgrade of Tile Calorimeter of the ATLAS Detector for the High Luminosity LHC.](#)

Eduardo Valdes Santurio On behalf of the ATLAS Tile Calorimeter System.....103

[HGCAL: A High-Granularity Calorimeter for the Endcaps of CMS at HL-LHC](#)

Christophe Ochando on behalf of the CMS Collaboration.....109

[Concepts and design of the CMS high granularity calorimeter Level-1 trigger](#)

Jean-Baptiste Sauvan on behalf of the CMS Collaboration.....113

[Challenges of Particle Flow reconstruction in the CMS High-Granularity Calorimeter at the High-Luminosity LHC](#)

Frank Chlebana on behalf of the CMS Collaboration.....117

[Fast-timing Capabilities of Silicon Sensors for the CMS High-Granularity Calorimeter at the High-Luminosity LHC](#)

Nural Akchurin on behalf of the CMS Collaboration.....121

7.Challenges for calorimeters

[Performance of Crystal Scintillators in a Severe Radiation Environment Caused by Protons](#)

Fan Yang, Liyuan Zhang, Ren-Yuan Zhu, Jon Kapustinsky, Ron Nelson and Zhehui Wang.....131

[Beam tests of proton-irradiated PbWO₄ crystals and evaluation of double-ended read-out technique for mitigation of radiation damage effects](#)

Marco Lucchini on behalf of the CMS Collaboration.....135

[Progress in the Development of the Lead Tungstate Crystals for EM-Calorimetry in High-Energy Physics](#)

R. W. Novotny, K.-T. Brinkmann, A. Borisevich, V. Dormenev, J. Houzvicka, M. Korjik and H.-G. Zaunick.....140

[Performances of Crystal Scintillators in a Severe Radiation Environment Caused by Gamma Rays](#)

F Yang, L Y Zhang and R-Y Zhu.....144

[Hadron calorimetry test bench](#)

Dmitri Kotchetkov, Justin Frantz, Nowo Rivel, Victor Mayatsky, Vladimir Brovin, Valentina Logunova, Marina Alexeeva, Nadezhda Dmitrienko, Boris Kosyanchuk, Yuri Pankov, Alexander Kozlov and Terry Awes.....148

[Study of the New Glass and Glass Ceramic Stoichiometric and Gd³⁺-loaded BaO*2SiO₂ \(DSB:Ce\) Scintillation Material for Future Calorimetry](#)

R. W. Novotny, K.-T. Brinkmann, A. Borisevich, V. Dormenev, M. Korjik, H.-G. Zaunick and S. Zimmermann.....152

[Study of properties of the plastic scintillator EJ-260 under irradiation with 150 MeV protons and 1.2MeV gamma-rays](#)

V. Dormenev, K.-T. Brinkmann, M. Korjik and R. W. Novotny.....156

8.New concepts for calorimetry

[Hadrons in the CALICE silicon-tungsten electromagnetic calorimeter](#)

Sviatoslav Bilokin, Naomi van der Kolk, Roman Pösch on behalf of the CALICE Collaboration.....160

[DHCAL with minimal absorber: measurements with positrons](#)

B. Freund, B. Bilki, F. Corriveau, C. Neubüser, Y. Onel, J. Repond On behalf of the CALICE Collaboration.....164

[Comparison of Energy Reconstruction Schemes and Different Granularities in the CALICE Scintillator-Steel Analogue Hadron Calorimeter](#)

Coralie Neubüser.....170

[Towards a Technological Prototype for a High-granularity Electromagnetic Calorimeter for Future Lepton Colliders](#)

Taikan Suehara on behalf of CALICE SiW-ECAL group.....175

9. Poster session

[Impact of Non-Uniformity in Light Collection on the Energy Resolution of the PANDA Electromagnetic Calorimeter at Photon Energies Below 1 GeV](#)

Stefan Diehl, Kai-Thomas Brinkmann, Peter Drexler, Valery Dormenev, Rainer W. Novotny, Christoph Rosenbaum, Hans-Georg Zaunick for the PANDA-Collaboration.....179

[Radiation hardness test of un-doped CsI crystals and Silicon Photomultipliers for the Mu2e calorimeter](#)

S Baccaro, A Cemmi, M Cordelli, E Diociaiuti, R Donghia, S Giovannella, S Loreti, S Miscetti, M Pillon and I Sarra.....183

[Low Light Image Detection Using Multi-channel Silicon Photomultiplier Camera](#)

Jin-A Jeon, H. Y. Lee, Il H. Park and Jik Lee.....187

[The Fabrication and Test of 64-Channel Silicon Photomultipliers](#)

H. Y. Lee, Jin-A Jeon, Il H. Park and Jik Lee.....190