

QCD@WORK 2012

International Workshop on Quantum Chromodynamics:
Theory and Experiment

Lecce, Italy 18 – 21 June 2012

EDITORS

Leonardo Angelini
Giuseppe Eugenio Bruno

Università di Bari, Bari, Italy

Gabriele Chiodini
Istituto Nazionale di Fisica Nucleare - Sezione di Lecce, Lecce, Italy

Pietro Colangelo
Istituto Nazionale di Fisica Nucleare - Sezione di Bari, Bari, Italy

Claudio Corianò
Università del Salento, Lecce, Italy

Donato Creanza
Polytechnic of Bari, Bari, Italy

Fulvia De Fazio
Eugenio Nappi
Istituto Nazionale di Fisica Nucleare - Sezione di Bari, Bari, Italy

All papers have been peer reviewed.

SPONSORING ORGANIZATIONS

Istituto Nazionale di Fisica Nucleare (INFN)
Università del Salento
Università di Bari "Aldo Moro"
Fondazione Monte dei Paschi di Siena

AIP
American Institute
of Physics

Melville, New York, 2012
AIP | CONFERENCE PROCEEDINGS ■ 1492

Editors

Leonardo Angelini
Giuseppe Eugenio Bruno
Università di Bari
Physics Department
Via Orabona 4, 70126 Bari
Italy

E-mail: leonardo.angelini@ba.infn.it
giuseppe.bruno@ba.infn.it

Gabriele Chiodini
Istituto Nazionale di Fisica
Nucleare - Sezione di Lecce
Via Arnesano, 73100 Lecce
Italy

E-mail: gabriele.chiodini@le.infn.it

Pietro Colangelo
Istituto Nazionale di Fisica
Nucleare - Sezione di Bari
Via Orabona 4, 70126 Bari
Italy

E-mail: pietro.colangelo@ba.infn.it

Claudio Corianò
Università del Salento
Physics Department
Via Arnesano, 73100 Lecce
Italy

E-mail: claudio.coriano@le.infn.it

Donato Creanza
Polytechnic of Bari
Via Orabona 4, 70126 Bari
Italy

E-mail: donato.creanza@ba.infn.it

Fulvia De Fazio
Eugenio Nappi
Istituto Nazionale di Fisica
Nucleare - Sezione di Bari
Via Orabona 4, 70126 Bari
Italy

E-mail: fulvia.defazio@ba.infn.it
eugenio.nappi@ba.infn.it

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 American Institute of Physics 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: 978-0-7354-1104-3/12/\$30.00.

© 2012 American Institute of Physics

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 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 Office of Rights and Permissions, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502, USA; Fax: 516-576-2450; Tel.: 516-576-2268; E-mail: rights@aip.org.

ISBN 978-0-7354-1104-3
ISSN 0094-243X
Printed in the United States of America

AIP Conference Proceedings, Volume 1492
QCD@Work 2012
**International Workshop on Quantum Chromodynamics: Theory and
Experiment**

Table of Contents

Preface: International Workshop on Quantum Chromodynamics - Theory and Experiment Leonardo Angelini, Giuseppe Eugenio Bruno, Gabriele Chiodini, Pietro Colangelo, Claudio Corianò, Donato Creanza, Fulvia De Fazio, and Eugenio Nappi	1
Committees	2
Diffraction Higgs production at LHC: A case study Luca Trentadue	3
Results on the search for the standard model Higgs boson at CMS Francesco Fabozzi and CMS Collaboration	10
ATLAS measurements of soft particle production and diffraction Šárka Todorova-Nová and ATLAS Collaboration	18
Investigation of the underlying event in pp collisions at the LHC with CMS Paolo Bartalini and CMS Collaboration	23
Spin determination of heavy s-channel diphoton resonances at the LHC M. C. Kumar, Prakash Mathews, A. A. Pankov, N. Paver, V. Ravindran, and A. V. Tsytin	28
Measurements of associated production of vector bosons and heavy flavours with the CMS detector S. Casasso and CMS Collaboration	35

Probing QCD with jets, photons and weak bosons at the LHC with ATLAS Ben Cooper and ATLAS Collaboration	40
The oblique S parameter in Higgsless electroweak models Ignasi Rosell	45
QCD studies with NA48 and NA62 M. Lenti and NA48 and NA62 Collaborations	50
Theoretical inputs and errors in the new hadronic currents in TAUOLA P. Roig, I. M. Nugent, T. Przedzinski, O. Shekhovtsova, and Z. Was	57
MC generator TAUOLA: Implementation of resonance chiral theory for two and three meson modes. Comparison with experiment O. Shekhovtsova, I. M. Nugent, T. Przedzinski, P. Roig, and Z. Was	62
Extraction of pion non-perturbative fragmentation functions in ZM-VFNS M. Soleymaninia, A. N. Khorramian, and S. M. Moosavinejad	67
$\eta' \rightarrow \pi^0 \gamma \gamma$ and $\eta' \rightarrow \eta \gamma \gamma$: A primer analysis Rafel Escribano	71
Recent results from COMPASS muon scattering measurements Luigi Capozza and COMPASS Collaboration	76
Search for new physics in $B \rightarrow D^* \tau \nu_{\tau}^{-}$ decay Svjetlana Fajfer, Jernej F. Kamenik, and Ivan Nišandžić	82
Non-leptonic decays in an extended chiral quark model J. O. Eeg	88
Soft contribution to $B \rightarrow \gamma \ell \nu_{\ell}$ from dispersion relations and duality V. M. Braun and A. Khodjamirian	95

New Physics constraints from optimized observables in $B \rightarrow K^* \mu^+ \mu^-$ at large recoil Sébastien Descotes-Genon, Joaquim Matias, and Javier Virto	103
First implications of LHCb data on models beyond the standard model Maria Valentina Carlucci	108
Rare $B_{(s)}$ decays in the standard model and in a scenario with two universal extra dimensions Pietro Biancofiore	113
B decays into a scalar/tensor meson: In pursuit of determining the CKM angle γ Wei Wang	117
Transition form factors of P wave bottomonium χ_{b0} ($1P$) into B_c meson J. Y. Süngü, K. Azizi, and H. Sundu	123
Meson–photon transition form factors Irina Balakireva, Wolfgang Lucha, and Dmitri Melikhov	127
Pion-photon transition form factor in light-cone sum rules A. V. Pimikov, A. P. Bakulev, S. V. Mikhailov, and N. G. Stefanis	134
Chiral anomaly and the BaBar and Belle measurements of the $\gamma\gamma^* \rightarrow \pi^0$ transition form factor T. N. Pham	139
Strong coupling constants of heavy baryons with light mesons in QCD T. M. Aliev, K. Azizi, and M. Savci	146
Iso-vector form factors of the delta and nucleon in QCD sum rules A. Ozpineci	153
Local-duality QCD sum rules for pseudoscalar-meson form factors Irina Balakireva, Wolfgang Lucha, and Dmitri Melikhov	161

QCD coupling constants and VDM G. Erkol, A. Ozpineci, and V. S. Zamiralov	165
Sigma meson and lowest possible glueball candidate in an extended linear σ model Tamal K. Mukherjee, Mei Huang, and Qi-Shu Yan	171
Low-energy QCD from first principles Marco Frasca	177
The LHCf experiment Koji Noda and LHCf Collaboration	182
A nonperturbative light-front coupled-cluster method J. R. Hiller	189
An illustration of the light-front coupled-cluster method in quantum electrodynamics S. S. Chabysheva	194
Worldline calculation of the three-gluon vertex N. Ahmadiniaz and C. Schubert	199
Massless scalar degrees of freedom in QCD and in the electroweak sector from the trace anomaly Luigi Delle Rose and Mirko Serino	205
Dilaton interactions in QCD and in the electroweak sector of the standard model Luigi Delle Rose and Mirko Serino	210
Results on charmonium-like states at <i>BaBar</i> Valentina Santoro	214
Quark confinement due to non-Abelian magnetic monopoles in SU(3) Yang-Mills theory Kei-Ichi Kondo, Akihiro Shibata, Toru Shinohara, and Seikou Kato	221

Gauge invariant quarkonium bound state equation H. Sazdjian	226
Accommodate chiral symmetry breaking and linear confinement in a dynamical holographic QCD model Danning Li, Mei Huang, and Qi-Shu Yan	233
The subleading order heavy-quark potential from AdS/CFT and meson melting De-fu Hou, Zi-qiang Zhang, Hai-cang Ren, and Lei Yin	240
On the Son-Yamamoto relation in the soft-wall holographic model of QCD Stefano Nicotri	245
Holography and chiral Lagrangian Fen Zuo	249
Pomeron dynamics in the AdS space and structure functions of hadrons at small x Akira Watanabe and Katsuhiko Suzuki	253
Impact of r-modes on the cooling of neutron stars Mark G. Alford, Simin Mahmoodifar, and Kai Schwenzer	257
Chiral transition in dense, magnetized matter Florian Preis, Anton Rebhan, and Andreas Schmitt	264
Mutual friction in color-flavor locked quark matter Motoi Tachibana	269
Quasiparticles and $Z(N)$-Lines in hot Yang-Mills theories Marco Ruggieri, Paolo Alba, Paolo Castorina, Salvatore Plumari, Claudia Ratti, and Vincenzo Greco	274
Spontaneous electromagnetic superconductivity induced by a strong magnetic field: QCD and electroweak theory M. N. Chernodub, J. Van Doorselaere, and H. Verschelde	281

Ginzburg-Landau approach to inhomogeneous chiral phases of QCD	
Hiroaki Abuki and Katsuhiko Suzuki	288
Chiral multicritical points driven by isospin density in the Ginzburg-Landau approach	
Yuhei Iwata, Hiroaki Abuki, and Katsuhiko Suzuki	293
A chiral quark-soliton model with broken scale invariance for nuclear matter	
V. Mantovani Sarti and A. Drago	297
In-medium effects on chiral condensate through holography	
Floriana Giannuzzi	302
Holography and the quark-gluon plasma	
F. Bigazzi and A. L. Cotrone	307
Results and perspectives on heavy flavour measurement with the ALICE inner tracking system in Pb-Pb collisions at the LHC	
A. Mastroserio and ALICE Collaboration	314
J/ψ measurements with the ALICE experiment at the LHC	
F. Fionda and ALICE Collaboration	319
Identified charged hadron production in pp and Pb-Pb collisions with the ALICE experiment at the LHC	
Francesco Barile and ALICE Collaboration	323
Transverse momentum broadening and gauge invariance	
Antonio Vairo	327
List of Participants	335
Author Index	337