XVII Workshop on High Energy Spin Physics (D-SPIN 2017)

Journal of Physics: Conference Series Volume 938

Dubna, Russia 11 – 15 September 2017

ISBN: 978-1-5108-5518-2 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© (2017) 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 938

XVII Workshop on High Energy Spin Physics "DSPIN-2017"

11–15 September 2017, Dubna, Russian Federation

Accepted papers received: 13 December 2017 Published online: 5 January 2018

Preface

XVII Workshop on High Energy Spin Physics "DSPIN-2017"

Peer review statement

Papers

SECTION 1: Experimental results

 Υ (nS) polarizations in pp collisions at $\sqrt{s} = 7_{and 8}$ TeV by the LHCb collaboration

Artamonov Alexander on behalf of the LHCb Collaboration....1

Longitudinal spin structure of the nucleon: COMPASS legacy

Yann Bedfer on behalf of the COMPASS collaboration.....9

Studies of GPDs at Jefferson Lab: results and future experiments

Angela Biselli for the CLAS collaboration.....15

Recent COMPASS results on Transverse Spin Asymmetries in SIDIS

Franco Bradamante on behalf of the COMPASS Collaboration.....23

Dp breakup reaction investigation using polarized and unpolarized deuteron beam

M Janek, V P Ladygin, Yu V Gurchin, A Yu Isupov, J-T Karachuk, A N Khrenov, A K Kurilkin, P K Kurilkin, A N Livanov, G Martinska, S M Piyadin, S G Reznikov, G Tarjanyiova, A A Terekhin and I E Vnukov.....31

Simultaneous measurements of spin observables A_N and A_{NN} in elastic *pp* scattering (extension of the SPASCHARM program at U-70).

V V Abramov, A A Bogdanov, M A Chetvertkov, V A Chetvertkova, V V Mochalov, V V Moiseev, K D Novikov, S B Nurushev, M B Nurusheva, V A Okorokov, P A Semenov, M N Strikhanov and A N Vasiliev.....37

First results on the energy scan of the vector A_y and tensor A_{yy} and A_{xx} analyzing powers in deuteron-proton elastic scattering at Nuclotron¹

V P Ladygin, A V Averyanov, E V Chernykh, D Enache, Yu V Gurchin, A Yu Isupov, M Janek, J-T Karachuk, A N Khrenov, D O Krivenkov, P K Kurilkin, N B Ladygina, A N Livanov, S M Piyadin, S G Reznikov, Ya T Skhomenko, A A Terekhin, A V Tishevsky and T Uesaka.....41

First results on the measurements of the proton beam polarization at internal target at Nuclotron¹

V P Ladygin, Yu V Gurchin, A Yu Isupov, M Janek, A N Khrenov, P K Kurilkin, A N Livanov, S M Piyadin, S G Reznikov, Ya T Skhomenko, A A Terekhin, A V Tishevsky, A V Averyanov, S N Bazylev, A S Belov, A V Butenko, E V Chernykh, Yu N Filatov, V V Fimushkin, D O Krivenkov, A M Kondratenko, M A Kondratenko, A D Kovalenko, I V Slepnev, V M Slepnev, A V Shutov, A O Sidorin, I E Vnukov and V S Volkov.....47

Extraction of helicity amplitude ratios from exclusive ρ^{0} -meson electroproduction on transversely polarized protons

S I Manaenkov on behalf of the HERMES collaboration.....51

Transverse target spin asymmetries in exclusive ω muoproduction at COMPASS

Bohdan Mariański (on behalf of the COMPASS Collaboration).....57

Overview of recent HERMES results

Hrachya Marukyan (On behalf of the HERMES Collaboration).....63

Measurement of q T-weighted TSAs in 2015 COMPASS Drell-Yan data

Jan Matoušek on behalf of the COMPASS Collaboration.....69

Study of nucleon correlations in nuclei by (p, p') inelastic reaction at 1 GeV

O V Miklukho, A Yu Kisselev, G M Amalsky, V A Andreev, G E Gavrilov, D S Ilyin, A A Izotov, N G Kozlenko, P V Kravchenko, M P Levchenko, D V Novinskiy, D A Maysuzenko, V I Murzin, A N Prokofiev, A V Shvedchikov, S I Trush and A A Zhdanov.....73

Comparative study of the inclusive asymmetries induced by polarized protons and antiprotons at 16 GeV/c at the U–70 accelerator

V A Okorokov, V V Abramov, A A Bogdanov, M A Chetvertkov, V A Chetvertkova, V V Mochalov, S B Nurushev, M B Nurusheva, V L Rykov, P A Semenov, M N Strikhanov and A N Vasiliev.....80

<u>COMPASS results on DVCS and exclusive π^0 production</u>

Andrzej Sandacz (on behalf of the COMPASS Collaboration).....87

Polarization observables in few nucleon systems with CLAS

Nicholas Zachariou for the CLAS collaboration.....95

SECTION 2: Technics and new developments

Source of polarized ions for the JINR accelerator complex

A S Belov, D E Donets, V V Fimushkin, A D Kovalenko, L V Kutuzova, Yu V Prokofichev, V B Shutov, A V Turbabin and V N Zubets.....101

Acceleration of Polarized Protons up to 3.4 GeV/c in the Nuclotron at JINR

A D Kovalenko, A V Butenko, V A Mikhaylov, M A Kondratenko, A M Kondratenko and Yu N Filatov.....107

Online polarimetry of the Nuclotron internal deuteron and proton beams

A Yu Isupov.....111

Algorithm for Calculation of Longitudinal Target Polarization

Yu Kiselev, N Doshita, K Kondo, T Iwata and G Nukazuka.....115

Impact of the Tilted Detector Solenoid on the Ion Polarization at JLEIC*

A M Kondratenko, M A Kondratenko, Yu N Filatov, Ya S Derbenev, F Lin, V S Morozov and Y Zhang.....119

Measurement of the deuteron beam polarization at internal target at Nuclotron for DSS experiment

Ya T Skhomenko, V P Ladygin, Yu V Gurchin, A Yu Isupov, M Janek, J-T Karachuk, A N Khrenov, P K Kurilkin, A N Livanov, S M Piyadin, S G Reznikov, A A Terekhin, A V Tishevsky, A V Averyanov, A S Belov, E V Chernykh, D Enache, V V Fimushkin and D O Krivenkov.....123

Design of magnetic system to produce intense beam of polarized molecules of H₂ and D₂

A V Yurchenko, D M Nikolenko, I A Rachek, Yu V Shestakov, D K Toporkov and A V Zorin....127

SECTION 3: Spin phisics at NICA SPD

Studies of the General Parton Distributions.

Sergey Goloskokov.....131

Spin Transparency Mode in the NICA Collider with Solenoid Siberian Snakes for Proton and Deuteron Beam

A D Kovalenko, A V Butenko, V A Mikhaylov, M A Kondratenko, A M Kondratenko and Yu N Filatov.....137

A possible layout of the Spin Physics Detector with toroid magnet.

A.P. Nagaytsev.....141

Fast polarimetry of the colliding proton beams based on the elastic *pp* analyzer using the <u>NICA detectors</u>

V I Sharov.....147

SECTION 4: Related problems

Spin shifts scale of gravitational interaction, opening new path to particle physics

Alexander Burinskii.....152

About long-range interaction of spheroidal solitons in scalar field nonlinear model

Alexander A. Chernitskii.....156

Constituent quark masses in Poincaré-invariant quantum mechanics

Viktor Andreev and Vadzim Haurysh.....160

Quantum scattering beyond the plane-wave approximation

Dmitry Karlovets.....165

Supersymmetric formulation of classical, quantum and stochastic dynamics

Nugzar Makhaldiani.....170

Impenetrable barriers for positrons in neighbourhood of superheavy nuclei with Z>118

V P Neznamov.....174

Emergent Spin and New Physics

Ivanhoe B. Pestov.....180

Polarized hydrogen/deuterium molecules

Yu V Shestakov, D M Nikolenko, I A Rachek, R Sh Sadykov, D K Toporkov, A V Yurchenko and S A Zevakov.....184

Empirical analysis of particle masses from PDG-2016

Sergey Sukhoruchkin.....188

Statistical analysis of 2D patterns and its application to astrometry

Petr Zavada and Karel Píška.....192

SECTION 5: Theory of spin physics

On the A-dependence of the neutron single-spin asymmetry in pA-collisions

V V Abramov.....198

Study of Spin through Gluon Poles

I V Anikin, L Szymanowski, O V Teryaev and N Volchanskiy.....204

Tests for the extraction of Boer-Mulders functions

Ekaterina Christova, Elliot Leader and Michail Stoilov.....209

<u>Global extraction of partonic transverse momentum distributions from semi-inclusive</u> <u>deep inelastic scattering and Drell-Yan data</u>

Filippo Delcarro, Alessandro Bacchetta, Cristian Pisano, Marco Radici and Andrea Signori.....215

The contribution of pseudoscalar and axial-vector mesons to hyperfine structure of muonic hydrogen

A. E. Dorokhov, N. I. Kochelev, A. P. Martynenko, F.A. Martynenko, A. E. Radzhabov and R.N. Faustov.....221

Neutrino spin oscillations in curved space-time under the influence of external fields

Maxim Dvornikov.....227

Intrinsic mass scale in QCD factorization

B I Ermolaev and S I Troyan.....233

Magnetic Polarizability of Virtual $(s\overline{s})_{and}(c\overline{c})_{Pairs in the Nucleon}$

Peter Filip.....239

Infrared models for the Bjorken sum rule in the APT approach

I. R. Gabdrakhmanov, O.V. Teryaev and V.L. Khandramai.....243

Infrared Confinement: Mass-Scale Dependence of the Strong Effective Coupling, Leptonic Decay Constants and Spectrum of Mesons, the Lowest Glueball Mass

Gurjav Ganbold.....247

The role of charge-symmetry invariance in the σ_{-1} "bremsstrahlung-weighted" photoabsorption sum rules for the non-relativistic and relativistic few-body systems

S.B. Gerasimov.....251

Simple criterium for CP conservation in 2HDM

I. F. Ginzburg.....255

<u>The analytical</u> $O(a_5^4)_{expression for the polarized Bjorken sum rule in the miniMOM</u>$ scheme and the consequences for the generalized Crewther relation

A. L. Kataev and V. S. Molokoedov.....261

A Monte Carlo code for the fragmentation of polarized quarks

A Kerbizi, X Artru, Z Belghobsi, F Bradamante and A Martin.....269

<u>Contributions of electromagnetic and strong anomalies to the $\eta(\eta') \rightarrow \gamma \gamma$ decays</u>

S. Khlebtsov, Y. Klopot, A. Oganesian and O.V. Teryaev.....275

Bread and butter physics: NLO electroweak corrections to polarized top quark decays

S Groote and J G Körner.....281

Signals of the double intrinsic heavy quark at the current experiments

Sergey Koshkarev and Stefan Groote.....287

Bjorken sum rule in QCD with analytic coupling

C Ayala, G Cvetič, A V Kotikov and B G Shaikhatdenov.....291

Possible effect of mixed phase and deconfinement upon spin correlations in the $\Lambda\bar{\Lambda}$ pairs generated in relativistic heavy-ion collisions

Valery V Lyuboshitz and Vladimir L Lyuboshitz.....297

Polarization effects in the reactions $p + {}^{3}He \rightarrow \pi^{+} + {}^{4}He, \pi^{+} + {}^{4}He \rightarrow p + {}^{3}He$ and quantum character of spin correlations in the final $(p, {}^{3}He)$ system

Valery V Lyuboshitz and Vladimir L Lyuboshitz.....301

Spin dynamics of fermion particles in gravitational and electromagnetic fields

Yuri N. Obukhov, Alexander J. Silenko and Oleg V. Teryaev.....305

Model identification of new heavy Z bosons at ILC with polarized beams

A.A. Pankov and A.V. Tsytrinov.....313

Momentum transfer dependence of the hadron GPDs and Compton form factors

O.V. Selyugin.....319

Manifestations of geometric phases in a proton electric-dipole-moment experiment in an all-electric storage ring

Alexander J. Silenko.....325

Nucleon structure functions in the truncated moments approach

D Strózik-Kotlorz, S V Mikhailov, O V Teryaev and A Kotlorz.....333

Polarization in heavy-ion collisions: magnetic field and vorticity

M. Baznat, K. Gudima, G. Prokhorov, A. Sorin, O. Teryaev and V. Zakharov.....339

Spin and model determination of Z - boson in lepton pair production at CERN LHC

A.V. Tsytrinov, A.A. Pankov, I.A. Serenkova and V.A. Bednyakov.....347

Angular distributions in pion-nucleon Drell-Yan process

I V Anikin, L Szymanowski, O V Teryaev and N Volchanskiy.....353

New Method for Taking into Account Radiative Events in the Inclusive Experiment MOLLER

Vladimir Zykunov.....359

SECTION 6: Spintronics and physics of nanostructures

Monte-Carlo study of drift mobility in ultrathin organic layers: Miller-Abrahams and Marcus models

Ya. V. Burdakov and V.R. Nikitenko.....363

Adsorption of chemical species on nitrogen-doped [60]fullerene: tight-binding study

Ilya Y. Dolinskiy and Nikolai V. Novikov.....367

An analytic modelling of charge transport in thin layers of disordered organic materials

M D Khan, V R Nikitenko and Ya V Burdakov.....373

Thermal Stability of Heptaprismane C₁₄H₁₄

Nikolai V. Novikov and Ilya Y. Dolinskiy.....378

Mechanical properties of fullerite of various composition

L. Kh. Rysaeva.....383

Temperature optimization of the Ti/Al/Ni/Au ohmic contact formation to the AlGaN/GaN heterostructure

S A Shostachenko, Y A Porokhonko, R V Zakharchenko, M S Burdykin, R V Ryzhuk, N I Kargin, B V Kalinin, A A Belov and A N Vasiliev.....390

Study of Ti/Si/Ti/Al/Ni/Au ohmic contact for AlGaN/GaN HEMT

S A Shostachenko, Y A Porokhonko, R V Zakharchenko, M S Burdykin, R V Ryzhuk, N I Kargin, B V Kalinin, A A Belov and A N Vasiliev.....399