

POLINA KRAVCHENKO

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EDUCATION

2010 - PhD thesis: Erlangen-Nürnberg University, Germany “The final inclusive and semi-inclusive longitudinal double-spin asymmetries at HERMES. Extraction of quark helicity distributions of the nucleon from deep-inelastic scattering”

1996 – Diploma thesis: Petersburg Technical University, Russia “Study of polarization in ${}^6\text{Li}(p, 2p){}^5\text{He}$ reaction at 1GeV using two-arm magnetic spectrometer”

PROFESSIONAL EXPERIENCE IN HIGH ENERGY PHYSICS

Project Double Polarized DD-fusion

Measurement of quintet suppression factor in DD-fusion

Experiment MUSUN

Study of muon capture on the deuteron

European XFEL

RESEARCH SCIENTIST, PNPI — 2012-2017

Work at present on:

- Monte-Carlo simulations of experimental setup and physics generator in GEANT4/ROOT framework for “Double Polarized DD-fusion” project.
- Analysis of experimental data for MUSUN experiment (PSI).
- Monte-Carlo simulations of scintillation detectors for XFEL (DESY).

Experiment PANDA

Hadron Physics on a Future Proton-Antiproton Facility

RESEARCH SCIENTIST, PNPI — 2012

Developed Monte-Carlo simulations of optical processes in GEANT4/ROOT framework for the PANDA Forward TOF Wall detector prototype.

Experiment HERMES

Study of the Nucleon Spin Structure

RESEARCH SCIENTIST, ERLANGEN-NÜRNBERG UNIVERSITY — 2011-2012

Performed full multi-dimensional analysis of azimuthal hadron asymmetries in semi-inclusive Deep Inelastic Scattering at HERMES. Completed- the extraction of valence quark helicity distribution functions from semi-inclusive hadron charge-difference asymmetries. Presented obtained results to the “PANIC” and “DIS” physics conferences in 2011 and 2012.

GUEST SCIENTIST, DESY HAMBURG — 2005-2010

Successfully completed analysis of spin asymmetries in inclusive and semi-inclusive DIS data collected by HERMES. Performed the extraction of quark helicity distributions of the nucleon from polarized DIS. Developed physics analysis code in C for multidimensional unfolding procedure. Performed profound Monte-Carlo studies of Parton Distribution Function and Fragmentation Function influence on the obtained sea quark distributions. Defended PhD thesis based on this work in 2010. Presented physics results of this work to the “MENU”, “Diffraction” and “Symmetries and Spin” conferences in 2005-2008.

GUEST SCIENTIST, DESY HAMBURG — 2003-2004

Developed C code for analysis of semi-inclusive hyperon production at HERMES, using maximum likelihood fitting technique in the framework of CERN MINUIT package. Performed the extraction of Λ and K_s asymmetries in DIS regime. Modified and tested available software for GEANT3 detector Monte-Carlo simulations. Performed Monte-Carlo parameter fine tuning in order to reproduce the general trends of kinematic distributions measured by the HERMES spectrometer.

Experiment ANKE

Investigation of Heavy Hyperon Production in pp-collisions close to Kinematic Threshold

GUEST SCIENTIST, IKP JÜLICH — 1997-1998, 2000-2002

Developed physics generator for GEANT3 Monte Carlo simulation of heavy hyperon production in $pp \rightarrow pK_x$ reaction. Participated in FORTRAN software development for ANKE detector Monte-Carlo description. Worked on the offline analysis of experimental data. Performed significant modifications to the existing official C++ /ROOT analysis codes. Presented results of physics analysis to the CERN-JINR European HEP School in 2000.

Experiment SC150

Study of Polarization in Quasi-Elastic Proton-Proton Scattering

RESEARCH SCIENTIST, PNPI GATCHINA — 1996-1997

Developed a set of Tcl/Tk monitoring applications for the online control of detector performance. Participated in physics analysis of collected data with the main focus on extraction of effective polarization of secondary protons in (p,2p) reaction on light nuclei. Defended diploma thesis in Petersburg Technical University based on this work in 1996.

COMPUTING SKILLS

Scientific programming in FORTRAN and C in UNIX environment

GEANT-based detector simulations using PYTHIA and LEPTO physics generators

Application programming in ROOT framework

TEACHING

2008 - 2009: Participation in DESY Summer student program (lectures and supervision)

PRESENTATIONS

2012: XX International Workshop on Deep-Inelastic Scattering and Related Subjects, Bonn, Germany "Longitudinal semi-inclusive double-spin asymmetries at HERMES"

2011 : The 19th Particles and Nuclei International Conference PANIC11, Boston, USA "Recent HERMES results on quark helicity distributions of the nucleon from deep-inelastic scattering"

2009 : European Nuclear Physics Conference, Bochum, Germany "HERMES measurements of the strange parton distribution and strange quark helicity distribution"

2008 : Workshop "Diffraction 2008", La Longe-les-Maures, France "Measurement of flavor separated quark polarizations at HERMES"

2007 : "MENU 2007" Conference, Juelich, Germany "Measurement of the spin structure functions and latest results on quark helicity distributions from Deep Inelastic Scattering at HERMES"

2007 : Hamburger student seminar "Measurement of flavor separated quark polarizations at HERMES"

2005 : Conference "Symmetries and Spin", Prague, Czech Republic "Quark helicity distributions from semi-inclusive deep-inelastic scattering"

2000 : CERN-JINR European School of High-Energy Physics, Caramulo, Portugal "Monte Carlo simulation of heavy hyperon production in $pp \rightarrow pK_x$ reaction at ANKE"

LANGUAGES

Russian (native)

English (fluent)

German (intermediate level)

REFERENCE LETTERS

Dr. Alexander Vasilyev (PNP, Russia) vassilie@pnpi.spb.ru

Prof. Klaus Rith (Erlangen, Germany) rith@mail.desy.de

Dr. Gunar Schnell (EHU/UPV, Bilbao) gschnell@mail.desy.de
Dr. Harold E. Jackson, Jr (Argonne National Laboratory, USA) hal@anl.gov

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