Curriculum Vitae

Albi Kerbizi

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I was born in 1992 in a small town in Albania during the post dicatorship hard times, and emigrated together with my family in Italy in 2004. Being fascinated by the world of physics learned during the High School classes, I decided to enroll in the University of Trieste dreaming to give one day my own contribution to the understanding of nature. In 2014 I graduated from Bachelor's degree in physics and in 2016 from Master's degree in theoretical physics. In 2016 I was awarded a PhD scholarship in particle physics in Trieste and graduated in March 2020. The PhD research was focused mainly on the study of the fragmentation process of polarized quarks, the process which converts quarks and gluons into observable hadrons, with the goal of introducing spin effects in the fragmentation part of modern Monte Carlo event generators used for the simulation of high energy physics processes. Currently I am a research fellow at the Trieste Section of INFN, I pursue the study of the internal structure of hadrons with the COMPASS group, I'm a CERN user and work on the COMPASS experiment.

Professional Experience

Feb. 2020 – Feb. 2022	**Research Fellow, INFN Trieste section**. Research fellow in the COMPASS group of INFN Trieste Section working on a poject tilted *Study of the internal structure of hadrons.* My activity concerns both data analysis and phenomenological description of the data.
Oct. 2020 – Jan. 2021	**Teaching Assistant**, Department of Physics, Trieste University. Teaching assistant at the Laboratory II course of Bachelor$'s$ Degree in Physics within the part of *Statistical analysis of experimental data*. I assisted students during hands on classes with computer simulation exercises aiming to a better understanding of statistics and data analysis.
Oct. 2019 – Jan. 2020	**Teaching Assistant**, Department of Physics, Trieste University. Teaching assistant at the Laboratory II course of Bachelor$'s$ Degree in Physics within the part of *Statistical analysis of experimental data*.
Oct. 2018 – Jan. 2019	**Teaching Assistant**, Department of Physics, Trieste University. Teaching assistant at the Laboratory II course of Bachelor$'s$ Degree in Physics within the part of *Statistical analysis of experimental data*.
Oct. 2017 – Jan. 2018	**Teaching Assistant**, Department of Physics, Trieste University. Teaching assistant at the Laboratory II course of Bachelor$'s$ Degree in Physics within the part of *Statistical analysis of experimental data*.
since 2020	**Member of the AMBER Collaboration**.
since 2015	**Member of the COMPASS Collaboration**.

Education

Nov. 2016 – Oct. 2019
PhD in Physics at University of Trieste, Trieste, Italy
graduated with summa cum laude
Under the supervision of Prof. Anna Martin and Prof. Xavier Artru, during the PhD I focused mainly on the phenomenological study of the fragmentation process of polarized quarks, building a stand alone Monte Carlo program for its simulation. This allowed for the first time to introduce spin effects in the hadronization part of Pythia 8 event generator, largely used in high energy physics. I also worked on the analysis of data from the COMPASS experiment. The PhD work lead to the thesis *Recursive fragmentation of a polarized quark*. The results have been published in peer reviewed journals as well as presented by me at several conferences.

Oct. 2014 – Sept. 2016
Master's Degree in Theoretical Physics at University of Trieste
graduated with summa cum laude
As trainship activity I studied closely the Pythia 6 event generator and used the gained knowledge for the thesis work on the study of the fragmentation process of polarized quarks. This lead to the thesis *"Study of the fragmentation process of transversely polarized quarks"* supervised by Prof. Anna Martin and Prof. Xavier Artru. The results have been presented by me in September 2018 at the International Spin Symposium held in Urbana (IL), USA.

Oct. 2011 – Jul. 2014
Bachelor's Degree in Physics at University of Trieste
graduated with summa cum laude
Under the supervision of Prof. Anna Martin, I produced the thesis *Impulso trasverso dei quark* (Transverse momentum of quarks) where a phenomenological study of the Cahn asymmetry in unpolarized SIDIS on deuterons as measured in the different kinematic regimes by the COMPASS experiment was performed. It allowed to extract the intrinsic transverse momentum of quarks in the nucleon. On invitation I presented the results in a COMPASS Analysis Meeting held at CERN.

Jul. 2011
High School degree at Liceo Scientifico G. Leopardi - E. Majorana, Pordenone, Italy
graduated with summa cum laude

Research Activity

Phenomenology and Modelling
Study of the fragmentation process of plarized quarks with emission of pseudoscalar mesons by using the string+$^3P_0$ model. The model has been implemented in a stand alone Monte Carlo program which allowed for a detailed numerical study of the model predictions. This work was done in collaboration with X. Artru and Z. Belghobsi and lead to two publications in Physical Review D.

Monte Carlo Development	Introduction, for the first time, of spin effects for pseudoscalar meson production in the hadronisation part of the Pythia 8 event generator by using the string+$^3P_0$ model. This work allows for the simulation of the Collins and dihadron asymmetries in the polarised SIDIS process on protons and deuterons. The work has been done in collaboration with L. Lönnblad. Part of the work was supported by the LDTMDP JLab project. The results have been presented by me at the DIS19 workshop. The code will soon be made available to the community.
Phenomenology and Modelling	Within the string+$^3P_0$ model, study of vector meson production in the fragmentation process of polarised quarks and of their polarized decay by taking into account the quantum mechanical correlations induced by the quark - vector meson - quark vertex. The model has been implemented in a stand alone Monte Carlo program.
Data Analysis	Data analysis in COMPASS regarding the study of the contribution of exclusive diffractive vector mesons decays to the azimuthal asymmetries measured in unpolarized SIDIS. The results were presented by me at the SPIN-18 symposium held in Ferrara.
Statistics	Monte Carlo simulations, using the replica method, to study the impact of a further run on transversely polarized deuterons in COMPASS on the uncertainty of the transversity parton distribution functions. This study was done in the preparation of the addendum to the COMPASS II proposal for the 2021 deuteron run.

Awards

September 2017	The Master's thesis has been awarded the *Master's Degree Award* by *Fondazione Zanolin Dametto*.

Technical skills

Programming Languages

Fortran	Advanced knowledge
C++	Advanced knowledge
C	Good knowledge

Tools

ROOT	Advanced knowledge
Pythia 6	Advanced knowledge
Pythia 8	Advanced knowledge
Mathematica	Good knowledge
LaTex	Good knowledge
Gnuplot	Good knowledge
MS Office	Advanced knowledge

Spoken languages

Albanian	Mother tongue
Italian	Mother tongue
English	Fluent
German	Basic