

VIJAY KUMAR

PH.D. RESEARCHER · (HADRONIC STRUCTURE STUDIES)

Department of Physics
University of Regina, Regina, Saskatchewan, Canada
☎ +1-306-585-4653 | ✉ vkb135@uregina.ca

Education

University of Regina

DOCTOR OF PHILOSOPHY (PH.D. PHYSICS)

- Supervisor: Prof. Garth Huber

3737 Wascana Parkway Regina,
SK S4S 0A2, Canada.
Fall 2018 - Present

Indian Institute of Technology (IIT) Ropar

MASTER OF SCIENCE (M.SC.PHYSICS)

- Supervisor: Dr. Pushpendra P. Singh

Nangal Rd, Hussainpur,
Rupnagar, Punjab 140001, India.
2015 - 2017

Dr. Bhimrao Ambedkar University Agra

BACHELOR OF SCIENCE (B.Sc. PCM)

Paliwal Park, Park Rd, Agra,
Uttar Pradesh 282004, India.
2010 - 2013

Ph.D. Thesis Research

My Ph.D. thesis research is involved in the better understanding of hadrons structures, the building-blocks of matter. The KaonLT (E12-09-011) and the PionLT (E12-19-006) experiments were conducted in the experimental Hall C at Thomas Jefferson National Accelerator Facility (Jefferson Lab), Newport News, Virginia, USA. The KaonLT experimental data were successfully collected at various experimental settings over Fall 2018 and Spring 2019. While the first run plan of the PionLT experiment was successfully ended in summer 2019. The principal goal of both the experiments is to separate out the pion and kaon electroproduction cross-section terms (σ_L , σ_T , σ_{LT} and σ_{TT}) using the “Rosenbluth separation technique”, and then attempt to extract their electromagnetic form factors. I am working on the experimental data analyses at $Q^2 = 0.5 \text{ GeV}^2$ from the KaonLT experiment and at $Q^2 = 0.38$ and 0.42 GeV^2 from the PionLT experiment. The Kaon analysis is a challenged at $Q^2 = 0.5 \text{ GeV}^2$, because the kaon PID is much more difficult than the pion PID.

Professional Experience

2019-Pres **Graduate Teaching Assistant**, Department of Physics, University of Regina, Regina, SK, Canada

2017-2018 **Junior Research Fellow (JRF)**, Department of Physics, Banaras Hindu University, Varanasi, India.

Publications

PUBLICATIONS IN REFEREED JOURNALS

A. K. Mondal et al., **Physical Review C** **102**, 064311 (2020).

ARTICLES SUBMITTED TO REFEREED JOURNALS

Coming soon!

OTHER PUBLICATIONS

I. Ahmed et al., **DAE Symp. Nucl. Phys.** **62** 1078 (2017).

Technical Reports

Vijay Kumar, *Ph.D. SUPERVISORY COMMITTEE REPORT*, October 13, 2021.

<https://logbooks.jlab.org/entry/3926847>

Vijay Kumar, *UPDATED SHMS HGC CALIBRATION CODE*, November 11, 2020.

<https://hallcweb.jlab.org/doc-private/ShowDocument?docid=1098/>

Vijay Kumar, *Ph.D. SUPERVISORY COMMITTEE REPORT*, September 2, 2020.

<http://lichen.phys.uregina.ca/>

Awards & Fellowships

10/25/2021	Faculty of Graduate Studies and Research Thesis Only Scholarship , University of Regina	\$ 677.50
09/08/2021	UR Graduate Scholarship , Physics Department, University of Regina	\$ 3,100.00
09/14/2020	UR Graduate Scholarship , Physics Department, University of Regina	\$ 2,240.00
03/18/2020	UR Graduate Scholarship , Physics Department, University of Regina	\$ 1,400.00
01/24/2020	Canadian Institute of Nuclear Physics Travel Award , CINP	\$ 600.00
01/20/2020	Faculty of Graduate Studies and Research Thesis Only Scholarship , University of Regina	\$ 992.00
01/20/2020	UR Graduate Scholarship , Physics Department, University of Regina	\$ 5,666.67
01/29/2019	UR Graduate Scholarship , Physics Department, University of Regina	\$ 2,000.00

Presentations

CONTRIBUTED PRESENTATIONS

Vijay Kumar et al., *“Update on the Kaon LT Experiment”*, Hall A/C User Meeting (online July 8-9, 2021)

<http://lichen.phys.uregina.ca>

Vijay Kumar et al., *“The Charged Kaon Electromagnetic Form Factor at Jefferson Lab”*, CAP Congress 2021 (online June 9-10, 2021)

<http://lichen.phys.uregina.ca>

Vijay Kumar et al., *“Kaon Electromagnetic Form Factor”*, Winter Nuclear and Particle Physics Conference (WNPPC February 13 -16, 2020) at Banff, Alberta, Canada.

http://lichen.phys.uregina.ca/index_files/talks/kumar_WNPPC2020.pdf

Vijay Kumar et al., *“Kaon L-T experiment”*, Winter Nuclear and Particle Physics Conference (WNPPC February 14 -17, 2019) at Banff, Alberta, Canada.

http://lichen.phys.uregina.ca/index_files/talks/kumar_WNPPC2019.pdf

Research Experience

University of Regina & Jefferson Lab

Regina, SK, Canada & Newport

News, Virginia, USA.

Fall 2020 - Present

PROF. GARTH HUBER

- Ph.D. thesis focused on the Kaon LT and the PionLT experiments at low Q^2 .
- Currently, analyzing experimental data using the ROOT, PYTHON and C++.
- Presenting progresses on the data analysis to the research group frequently.
- Took experimental data for our experiment too.
- Participating in data taking in other experiments in the Hall C at Jefferson Lab.
- Responsible for backing up experimental data and online analysis records on wiki and redmine.

Joint Institute for Nuclear Research (JINR)

Dubna, Russia.

DR. AJAY KUMAR TYAGI

26 Jan - 25 Mar 2018

- Performed the calibration analyses using the ROOT and C++ of the *“Tagged Neutrons and Gamma Rays setup”* in the Frank Laboratory of Neutron Physics at JINR, Dubna, Russia. This visit was sponsored by the Indo-Russian joint research project, awarded to Dr. Ajay Kumar Tyagi by the DST, Government of India and the RFBR, Russia at Department of Physics, Banaras Hindu University, Varanasi, India.

IIT Ropar

*Nangal Rd, Hussainpur,
Rupnagar, Punjab 140001, India.
2016-2017*

DR. PUSHPENDRA PAL SINGH

- M.Sc. research project was carried out on the characterization of High Purity Germanium (HPGe) detectors, and analyzed the natural background experimental data using the RadWare software package. This work was conducted to understand the natural background inside the laboratory at IIT Ropar for the future studies of neutrinoless double beta decay.

IIT Ropar

*Nangal Rd, Hussainpur,
Rupnagar, Punjab 140001, India.
2016-2017*

DR. ASOKA BISWAS

- A short summer research project was performed on the calculations of the absorption and decay probabilities of the two level quantum system using the MATLAB computer code for the laser applications.

Outreach & Professional Development

SERVICE AND OUTREACH

08/02/2020 **IIT ROPAR ALUMNI ASSOCIATION, Speaker, TOPIC: PRE & POST MASTERS: WHAT, HOW & WHEN?**