DR. RIJEESH KELOTH

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EDUCATION

Kannur University, Kerala, INDIA *June 2002- March 2005*
B.Sc. in Physics

Calicut University, Kerala, INDIA *June 2005- March 2006*
B.Ed. in Physical Sciences

Mahatma Gandhi University, Kerala, INDIA *June 2006- March 2008*
M.Sc. in Physics

Cochin University of Science and Technology, INDIA *November 2012- December 2014*
Junior research fellow in Experimental Neutrino Physics

Fermilab, USA/ CUSAT, INDIA *January 2015- May 2019*
(As a part of Indian Institutions and Fermilab Consortium)
Ph.D in experimental neutrino physics

Ph.D. Thesis Topic: A search for Anomalous Muon Neutrino Disappearance and Tau Neutrino Appearance using NOvA Near Detector

RESEARCH EXPERIENCE

Post-Doc in SoLid Neutrino Experiment *Oct 2020- present*
IIHE/VUB Belgium
Currently working in SoLid experiment.

Research Associate in NOvA Experiment *June 2019- June 2020*
IIT Hyderabad, India

- Worked on the topics related to Muon Removal -tau (MR-tau) studies for finding the selection efficiencies of tau neutrinos in the NOvA near detector.
- A significant contribution in on-going NSI analysis in NOvA.

Visiting Graduate Student in NOvA Experiment *January 2015- August 2018*
Fermilab, USA

- Conducted the feasibility study of measuring short-baseline oscillations using $\nu_\mu \rightarrow \nu_e$ channel with the NOvA Near Detector.
- Performed sensitivity studies to estimate the potential of building additional detectors at different off-axis angles for sensitivity to light sterile neutrinos.
- Expanded new tools to enhance the oscillation framework for short-baseline τ appearance analysis in the NOvA near detector.

- Developed particle identifiers for hadronic mode ν_τ CC interactions using Boosted Decision Tree (BDT) Algorithm implemented in Toolkit for Multivariate Data Analysis (TMVA) with ROOT.
- Special tau-overlay file production for ν_τ appearance analysis in the NOvA near detector.
- Optimization of event selection for $\nu_\mu \to \nu_\tau$ and $\nu_\mu \to \nu_\mu$ selections used for a joint fit to the four-flavor oscillation parameters.
- Led comprehensive systematics studies for the first NOvA analysis using τ's.
- Led sideband studies for the validation of new particle identifiers.
- Led sensitivity studies for the joint $\nu_\mu - \nu_\tau$ analysis.

Computing and File Production

- An expert in monte-carlo production in NOvA.
- Made a significant contributions to the production of data files corresponding to 8×10^{20} POT needed for the various analyses in NOvA including 2016 and 2017 ν_e appearance, ν_μ disappearance and 2017 Neutral Current disappearance analyses.

Hardware

- Trained as an APD quality analysis expert in NOvA.
- Trained expert in NOvA electronic replacements.

TEACHING EXPERIENCE

Malabar Christian College(MCC), Calicut, INDIA *October 2009 - March 2012*

- Teaching(B.Sc. level)- Electronics, mechanics, electrodynamics and quantum physics (24 hrs./week)

Cochin University of Science and Technology, INDIA *November 2013 - March 2014*

- Teaching- Mathematical Physics for 1st year M.Sc. students (6 hrs./week)

TECHNICAL SKILLS

Computer Languages	C++, bash scripting, python
Software	File production, Neutrino oscillation framework
Data analysis	Neutrino Oscillation Analysis
Hardware	Avalanche Photo Diode (APD) quality analysis
	Electronic circuit board installation and replacement