Student Sessions 2024

Report of Contributions

Contribution ID: **1** Type: **not specified**

Refactorization of the MTD DAQ Software by Sana Khattak.

Wednesday 7 August 2024 09:00 (15 minutes)

My name is Sana Khattak. I am a 4th year physics undergrad at the University of Bahrain. I work on the CMS experiment under Dr. Özgür Sahin.

My project is about the MTD which is a timing detector. It is part of the phase-2 upgrades to CMS for the HL-LHC. My work is on restructuring and refactorization of code and documentation.

Presenter: KHATTAK, Sana Ruknudin S.

Session Classification: Student Session

Contribution ID: **2** Type: **not specified**

Superconducting Joints for the BASE Superconducting Coil System

Wednesday 7 August 2024 09:15 (15 minutes)

The Baryon Antibaryon Symmetry Experiment (BASE) makes world leading precision measurements of the fundamental properties of protons and anti-protons to look for CPT violation in the standard model of particle physics. To keep improving measurements BASE must have very strong control of the systematics of the experiment, primarily the magnetic field. BASE exists inside CERN's Antimatter Factory, where the magnetic field is fluctuating due to the different decelerator magnets. In order to achieve a magnetic field that is homogenous and stable over time BASE must implement a superconducting coil system which allows them to tune the magnetic field in their measurement traps. In this talk I will talk about this coil system and its requirements for improved superconducting electrical joints in order to improve the performance of the system.

Thomas Hepworth is entering his 4th year of his physics honours degree at the University of Winnipeg. He is from Transcona, in Winnipeg, Manitoba, Canada.

Presenter: HEPWORTH, Thomas

Session Classification: Student Session

Contribution ID: **3** Type: **not specified**

Sarah B N S A Alkhudari

Wednesday 7 August 2024 09:30 (15 minutes)

Sarah al Khudari earned her bachelor's in Computer Engineering from the American University of the Middle East. After discovering her passion for programming in 2023, she's dedicated to advancing her skills. She works as a contractor and instructor at the first Coding Academy in the Middle East, where she introduces young people to programming. In her free time, Sarah enjoys baking and engaging in lively discussions.
Arriving at CERN with only a basic understanding of physics—Newton's first law and the fact that protons colliding creates a "BOOM!"—Sarah was eager to tackle this new challenge. Her interest in AI and Machine Learning led her to a position with the CMS DQM team, where she worked with Roberto Seidita and Antonio Vagnerini. This summer has been a fantastic learning experience, allowing her to explore Data Quality Monitoring and build machine learning models. She views this opportunity as the first step toward earning a Master's in AI/Machine Learning and eventually pursuing a Ph.D.

Presenter: ALKHUDARI, Sarah B N S A

Session Classification: Student Session

Contribution ID: **4** Type: **not specified**

Avery Bryn Hanna

Wednesday 7 August 2024 09:45 (15 minutes)

Automating ATLAS control room anomaly detection with machine learning

Avery Hanna is a Bachelors student at Tufts University studying engineering physics. As a summer student at CERN she has been working on developing a machine learning tool to detect anomalies in detector operation for online use in the ATLAS control room. In this talk, she will review the model design and its performance which shows promise for the future possibility of online deployment.

Presenter: HANNA, Avery Bryn

Session Classification: Student Session

Contribution ID: **5** Type: **not specified**

Alaa Nabeel M. Husain

Wednesday 7 August 2024 10:15 (15 minutes)

Calibration of the Temperature Sensors for the CMS MTD DAQ System

Hello I'm Alaa. I exist. I graduated with a degree in Mechanical Engineering from the University of Bahrain. My days are filled with equations, diagrams, and the occasional existential crisis.

Presenter: HUSAIN, Alaa Nabeel M.

Session Classification: Student Session

Contribution ID: **6** Type: **not specified**

Abbas Ahmad Jheir

Wednesday 7 August 2024 10:30 (15 minutes)

ME0 GEM Detectors for the CMS experiment, CERN

I am Abbas JHEIR master's student in Fundamental physics at the Lebanese University from Lebanon. And to diversify my knowledge in different fields like optics and electronics, I did a 1-year internship in Fiber Optics Laboratory at Lebanese University, Lebanon. Now an intern at CERN working on GEM detectors for CMS experiment, @ Prevessin site/B904 Lab.

Presenter: JHEIR, Abbas Ahmad

Session Classification: Student Session

Contribution ID: **7** Type: **not specified**

Yasuhiro Maruya

Wednesday 7 August 2024 10:45 (15 minutes)

High energy neutrino measurement using the FASER detector

Hello, my name is Yasuhiro Maruya. I am a master student from Tokyo Institute of Technology, Japan. Currently, in my university, I am studying the flavor tagging algorism of ATLAS experiments. I like games, talking physics, and research.
In this summer student programme, I joined the FASER experiment. My research theme is evaluating the possibility of detecting electron neutrino using the calorimeter system of the FASER detector. My study is physics analysis using Monte Carlo simulation.
In this talk, I will explain neutrino measurement of FASER experiment and my study.

Presenter: MARUYA, Yasuhiro

Session Classification: Student Session

Contribution ID: **8** Type: **not specified**

Abdullah M A J M H Alsayegh

Wednesday 7 August 2024 11:15 (15 minutes)

My name is Abdullah AlSayegh, I am an Electrical Engineering from the American University of the Middle East in Kuwait. At my time there I excelled in Electrical Engineering; I particularly enjoyed solving problems and building circuits for a range of applications. At CERN, I am working on the Compact Muon Solenoid project in Prévessin Building 904 where the CMS GEM group is based. I work with the assembly and the quality control of the Gas detection modules. Most of my work is related to the ME0 module. I have designed a new PCB which will replace older and weaker components of the quality control process.

Presenter: ALSAYEGH, Abdullah M A J M H

Session Classification: Student Session

Contribution ID: **9** Type: **not specified**

Anomaly detection and stability measurement with the CMS Pixel Luminosity Telescope

Wednesday 7 August 2024 11:30 (15 minutes)

Katie Ream is a rising senior from Holliston, MA studying physics at the University of Michigan. During her time in undergrad she has worked on a variety of high energy particle physics projects, such as the ATLAS project or the SBND detector at Fermilab. This summer she pivoted to working on the CMS project under the BRIL group in order to develop an algorithm focusing on detecting outliers in luminosity measurements as well as determining the stability of luminosity measurements over long periods of time. In this talk she discusses the motivation for for the algorithm in further detail, what was involved in building the algorithm, and the results after applying it to data from 2023.

Presenter: REAM, Kathryn Mary

Session Classification: Student Session

Contribution ID: **10** Type: **not specified**

Natalya Gerassyova

Wednesday 7 August 2024 11:45 (15 minutes)

Characterisation of silicon sensors for the CMS HGCAL project

My name is Natalya Gerassyova and I am from Kazakhstan. I just finished my first year of master's majoring in nuclear physics in the Al-Farabi Kazakh National University. During my undergraduate studies I have worked with modelling straw detectors for NA64 experiment using Geant4 toolkit.
Here at CERN, I've been working in EP-DT-TP section under the HGCAL project, working on annealing studies of irradiated silicon diodes.

Presenter: GERASSYOVA, Natalya

Session Classification: Student Session

Contribution ID: **11** Type: **not specified**

Josephine Brewster

Thursday 8 August 2024 09:00 (15 minutes)

Josephine Brewster is going into her final year of her undergraduate degree at the University of Victoria in Canada. She is currently working in the ATLAS diHiggs to 4b group with TRIUMF from Vancouver, Canada. She has previously worked in medical physics and on a future collider project and is planning to pursue graduate studies in high energy physics.

Presenter: BREWSTER, Josephine

Session Classification: Student Session

Contribution ID: **12** Type: **not specified**

Nasir Hussain

Thursday 8 August 2024 09:15 (15 minutes)

My name is Nasir Hussain, and I am from Pakistan. I am currently pursuing my Bachelor's degree in Computer Science at Quaid-i-Azam University. This summer, I have the privilege of working at CERN, focusing on anomaly detection within the CMSWEB services.

In this presentation, I will provide a comprehensive overview of my project, detailing my current progress and outlining the goals I aim to achieve. Additionally, I will delve into some of the fundamental concepts and critical topics that underpin my research.

Presenter: Mr HUSSAIN, Nasir

Session Classification: Student Session

Contribution ID: **13** Type: **not specified**

Carolina Marisol Aguilar Rivera

Thursday 8 August 2024 09:30 (15 minutes)

My name is Carolina Marisol Aguilar Rivera, I'm currently writing my undergraduate thesis for the B.S. in Physics at the Benemérita Universidad Autónoma de Puebla (BUAP), one of the top-ranked universities in Mexico for B.S. Physics programs.

In my country and here at CERN, I specialize in detectors and proudly work for the RPC-group collaboration in the CMS experiment. I have experience working with RPCs and iRPCs (the previous and new gas detectors that are under construction for the new HL-LHC phase). I'm involved in the assembly, quality control, test beams at GIF++, research for new eco-gas mixtures to replace the standard one, and more activities related to iRPCs.

Presenter: Ms AGUILAR RIVERA, Carolina Marisol (Autonomous University of Puebla (MX))

Session Classification: Student Session

Contribution ID: **14** Type: **not specified**

Pongsakorn Sriling

Thursday 8 August 2024 09:45 (15 minutes)

I'm Pongsakorn Sriling from Bangkok, Thailand. I completed my bachelor's degree in Physics at Chulalongkorn University with a project on the feasibility of applying Machine Learning models in CMS Data Quality Monitoring (DQM). I will continue my studies by pursuing a Master's degree in Physics at Chulalongkorn University, in a research-oriented program. I am currently working on two projects as a part of my academic pursuit: physics projection studies from LHC to FCC and contributing to the development of a CMS flash simulation, a new ML-based simulation framework with the CMS Pisa team.

Presenter: SRILING, Pongsakorn

Session Classification: Student Session

Contribution ID: **15** Type: **not specified**

Pablo Villasenor Inda

Thursday 8 August 2024 10:15 (15 minutes)

Presenter: VILLASENOR INDA, Pablo

Session Classification: Student Session

Contribution ID: **16** Type: **not specified**

Julia Park White

Thursday 8 August 2024 10:30 (15 minutes)

Julia White is a Bachelor's student at Bates College in the US where she is studying physics. This summer, she built on her Atomic, Molecular, and Optical physics work while helping to perform data processing and analysis on the HiRadMat beam line. In this talk, she will review the app she built to run this analysis and discuss some of the interesting optics and beam behaviors she observed.

Presenter: WHITE, Julia

Session Classification: Student Session

Contribution ID: **17** Type: **not specified**

Maryam Kamashki

Thursday 8 August 2024 10:45 (15 minutes)

Title: Establishing Communication Between MTD DAQ Software and Integrated xDAQ Services

Introduction: My name is Maryam Kamashki, I am a graduate with a Bachelor's degree in Computer Science –Cloud Computing at the university of Bahrain. Currently, I am a summer student at CERN, where I focus on integrating MTD DAQ software with xDAQ services. In this presentation, I will elaborate on the progress of my project.

Presenter: KAMASHKI, Maryam

Session Classification: Student Session

Contribution ID: **18** Type: **not specified**

Qassem Awayies

Thursday 8 August 2024 11:15 (15 minutes)

Qassem Awayies, a Palestinian student of fundamental physics. He obtained his Bachelor's degree in physics from An-Najah National University in Palestine. During his Bachelor's studies, he was an intern at Irene Joiliot Curie labs at Paris. There, he was investigating the production of anti-hyprons and anti-protons with ALICE experimental team. He also was engaged in research in the field of computational condensed matter physics with his university in Palestine. Now he is a summer student at CERN working with ATLAS experimental team to investigate the interaction between the infamous Higgs Boson and the Charm quark. He will then start his Master's of physics at the University of Paris-Saclay in France.

Presenter: AWAYIES, Qassem (CERN)

Session Classification: Student Session

Contribution ID: **19** Type: **not specified**

Zach Charlesworth

Thursday 8 August 2024 11:30 (15 minutes)

Zach is entering his fourth year of honours physics at McGill University in Montreal, Canada. Currently, he is working with the ALPHA collaboration in the antimatter factory on both the ALPHA2 and ALPHA-g experiments.

Presenter: CHARLESWORTH, Zachariah Zain

Session Classification: Student Session

Contribution ID: **20** Type: **not specified**

Evaluating Trigger Efficiencies for W Boson to Three Charged Pion Decays.

Thursday 8 August 2024 11:45 (15 minutes)

Introduction:
Logan is a rising 4th-year Bachelors student at a Liberal Arts College called Pacific University in Forest Grove, Oregon, USA. He is double majoring in Physics and Mathematics and believes his career path is guiding him toward theoretical particle cosmology.

Abstract:
The Compact Muon Solenoid (CMS) detector records, at its peak, around 1 billion interactions per second (CMS Collaboration), which, over time, is way too much data to hang on to long-term. This is why CMS utilizes detector components called triggers, which sift through and decide whether or not to keep data. This project focuses on a more detail-oriented trigger, the High-Level Trigger (HLT) looking for an unobserved interaction: W-Boson decay into three charged pions. More specifically, we are analyzing the efficiency of triggers looking for this interaction to see if we can find a replacement for the DeepTau HLT trigger algorithm.

Presenter: SWITZER, Logan Scott

Session Classification: Student Session

Contribution ID: **21** Type: **not specified**

Search of VH(cc) in full hadronic channel - Isadora Galvão

Friday 9 August 2024 09:00 (15 minutes)

Isadora Galvão is currently on the last year of her bachelor's degree in Physics in the São Paulo State University (unesp), Brazil. During her stay at CERN, she will be performing an analysis on the coupling between the Higgs boson and charm quark among the CMS Collaboration, under the supervision of Fabio Monti and Beatriz Ribeiro Lopes.

Presenter: GALVAO, Isadora

Session Classification: Student Session

Contribution ID: **22** Type: **not specified**

Searches for QCD Instantons with ALFA Detector - feasibility study

Friday 9 August 2024 09:15 (15 minutes)

Tamilarasan Ketheeswaran is a master's student at RWTH Aachen University, specializing in theoretical particle physics. He is currently working with the ATLAS group at CERN on a project that explores the feasibility of detecting QCD instantons using the ALFA detector. This project involves investigating a theoretical QCD phenomenon that could provide deeper insights into the non-perturbative aspects of particle interactions.

Presenter: KETHEESWARAN, Tamilarasan

Session Classification: Student Session

Contribution ID: **23** Type: **not specified**

Luminosity studies using muons from the CMS L1 scouting system

Friday 9 August 2024 09:30 (15 minutes)

My name is Mawada Ali. I am a Sudanese student born and raised in Saudi Arabia, currently pursuing a BSc in Physics as the valedictorian at Alexandria University in Egypt.

For the past month, I have been working with the L1-scouting group at the CMS experiment at CERN, focusing on data analysis. Grateful for this invaluable learning experience, I will soon return to my university to complete my final year. After graduation, I plan to pursue postgraduate studies in nuclear and high-energy physics, with the hope of returning to CERN to contribute and share my knowledge and experience.

Presenter: ALI, Mawada

Session Classification: Student Session

Contribution ID: **24** Type: **not specified**

Alexander John Champion

Friday 9 August 2024 09:45 (15 minutes)

Alexander Champion is a British physics student and teaching assistant from Norwich in the East of England. He is currently studying for a Master's degree in Physics at University College London, alongside working as a teaching assistant for children with special educational needs and disabilities. He holds a Bachelor's degree in Physics with Astrophysics from the University of York, in the north of England. His undergraduate thesis was on particle-astrophysics, focusing specifically on neutron star equations of state, assuming new and exotic degrees of freedom.
At CERN he works with both ATLAS Forward Proton and SFT, developing tracking and visualisation software for accelerator optics and beam dynamics.
He enjoys reading, politics, being outdoors and playing chess, he speaks one language well and two others very badly.

Presenter: CHAMPION, Alexander John

Session Classification: Student Session

Contribution ID: **25** Type: **not specified**

Overview of the Readout Electronics of the ATLAS Liquid Argon Calorimeter Phase-II Upgrade

Friday 9 August 2024 10:15 (15 minutes)

Elio Desbiens is an undergraduate student in physics at Université de Montréal in Canada, but is currently working in the ATLAS group at McGill University. They are working on software development for the electronic readout upgrade of the Liquid Argon calorimeter. They have past research experience in social sciences and in astrophysics. They want to pursue a career in theoretical particle physics.

Presenter: DESBIENS, Elio

Session Classification: Student Session

Contribution ID: **26** Type: **not specified**

Shungo Fukaya

Friday 9 August 2024 10:30 (15 minutes)

Hi, my name is Shungo Fukaya and I just graduated from Northwestern University (USA) with a BS in applied math. I am currently working in the ALPHA team on the characterization of silicon photomultipliers (SiPMs) incorporated in our latest trap design that enables more efficient and precise measurements of antihydrogen atoms. After this summer program, I will start my PhD focusing on precision measurements of ultracold radioactive polar molecules at MIT.

Presenter: FUKAYA, Shungo

Session Classification: Student Session

Contribution ID: **27** Type: **not specified**

Adrian Jose Vasquez Ratti

Friday 9 August 2024 10:45 (15 minutes)

Hi. My name is Adrián Vásquez, I'm from Venezuela and I'm finishing my master degree in Physics at The Simón Bolívar University located in my country. From the beginning of my master I've been working in collaboration with LPNHE (Lab of Nuclear and High Energies Physics of Paris Cité/Sorbonne Université located in Paris) for the production and optimization of HGTD Modules. HGTD is a new detector that will be implemented in ATLAS for 2029 in the High Luminosity phase and My master thesis is about the performance of the sensors and simulations previous the installation.

Presenter: VASQUEZ RATTI, Adrian Jose (CERN)

Session Classification: Student Session

Contribution ID: **28** Type: **not specified**

Simulation Based Inference(SBI) in RooFit

Friday 9 August 2024 11:15 (15 minutes)

I'm Robin from Germany, currently pursuing my master degree in physics.

I recently had the opportunity to contribute to the ROOT team at CERN, working on a project focused on simulation-based inference to enhance the predictive power of parameter estimation.

Presenter: SYRING, Robin

Session Classification: Student Session

Contribution ID: **29** Type: **not specified**

The measurement of the Boosted ttZ process

Friday 9 August 2024 11:30 (15 minutes)

My name is Chaimaa Karam, and I'm a second-year master's student in Mathematical Physics at Mohammed V University in Rabat, Morocco. I'm working on my master's thesis, which I will complete in September 2024. My research focuses on Neutrino Physics, where I'm studying how to detect neutrinos and construct detectors as part of the KM3NeT project. During this work, I also participated as a student intern, helping to integrate 18 Digital Optical Modules (DOMs), which are key components of the neutrino telescope.
This summer, I'm part of the CERN Summer Student Program 2024. I'm working on measuring the Boosted ttZ process at the ATLAS experiment. This experience is deepening my knowledge of particle physics and helping me learn more about ROOT coding.
After this program, I plan to apply for a Ph.D.

Presenter: KARAM, Chaimaa

Session Classification: Student Session

Contribution ID: **30** Type: **not specified**

Impact of 4D Tracking in Flavour Tagging Applications

Friday 9 August 2024 11:45 (15 minutes)

Andraž is currently pursuing a Master's degree in Physics with a focus on Particle and Computational Physics at the University of Ljubljana. He focuses on the integration of machine learning techniques with experimental particle physics. He has conducted some analyses for the ATLAS experiment at Jozef Stefan Institute. He is now a part of the ATLAS Collaboration as a summer student.

Presenter: TOMSIC, Andraz

Session Classification: Student Session