Journées de Rencontre Jeunes Chercheur·se·s 2025

Rapport sur les contributions

https://indico.in2p3.fr/e/jrjc2025

ID de Contribution: **1** Type: **Non spécifié**

Non-resonant Higgs boson pair production search and photon shower shapes correction via normalizing flows

lundi 1 décembre 2025 12:05 (25 minutes)

The search for non-resonant Higgs boson pair production provides an important probe to the Higgs self-coupling and thus the electroweak symmetry breaking mechanism. The HH $\rightarrow bb\gamma\gamma$ channel is one of the most sensitive channels in the search for di-Higgs bosons. The search performed with Run2 and partial Run3 data collected by the ATLAS experiment with the unprecedented luminosity of about 300 fb^{-1} will be presented. The di-Higgs cross section in the Standard Model (SM) is very small and upper limits on this cross section are derived for the SM and for several beyond the Standard Model scenarios.

Since photons play a central role in this channel, their identification has a direct impact on the sensitivity of the analysis. In particular, shower shape variables in the ATLAS calorimeter are used for electron and photon identification. However, due to the well-known mismodelling of the calorimeter in Geant4-based simulations, shower shape variables show differences between data and MC. To address these differences, a novel correction strategy based on normalizing flows has been proposed. This approach provides an accurate correction of shower shape variables while preserving correlations between them. The performance of this approach will be presented.

Auteur: KAZAKOVA, Katerina (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))

Orateur: KAZAKOVA, Katerina (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **2** Type: **Non spécifié**

Optimization of embedded neural networks for the energy reconstruction of the liquid argon calorimeter cells of ATLAS

vendredi 5 décembre 2025 14:45 (25 minutes)

The Large Hadron Collider (LHC) collides protons at nearly the speed of light, producing new particles observed by the ATLAS detector. In 2026, the LHC will undergo a major upgrade to the High-Luminosity LHC (HL-LHC), increasing luminosity by a factor of 5–7 and delivering up to 200 simultaneous collisions. To cope with the resulting data rates, ATLAS will replace the readout electronics of the Liquid Argon Calorimeter (LAr) as part of its Phase-II upgrade. The new LASP board, equipped with two FPGAs, will perform real-time energy reconstruction for 384 channels each, covering about 180,000 calorimeter cells in total.

At high pileup, overlapping electronic pulses challenge the current Optimal Filtering (OF) algorithm used to compute the energy. Neural network (NN)–based alternatives are being explored to surpass OF while respecting FPGA constraints: <125 ns latency and limited resource usage. After earlier studies of recurrent and convolutional architectures, a dense-layer design is proposed, reducing both latency and resource consumption.

Bayesian hyperparameter optimization is used to adapt the network size, balancing energy resolution with FPGA feasibility. The results show how to achieve optimal performance within hardware limits. In addition, deep evidential regression is employed to estimate uncertainties by fitting predicted energies to probability distributions, enabling quantification of both data noise and model imprecision with minimal overhead.

The talk will compare network architectures and present the Bayesian optimization results, as well as demonstrate uncertainty estimation with evidential regression.

Auteur: BERTRAND, Raphael (Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France)

Orateur: BERTRAND, Raphael (Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France)

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **3** Type: **Non spécifié**

Low-energy calibration of DUNE prototypes at CERN with Michel electron energy reconstruction

mardi 2 décembre 2025 16:35 (25 minutes)

DUNE is a neutrino oscillation experiment expected to take its first data around 2030. A near and a far measurement of a accelerator-produced muon neutrino flux allows for a precise determination of the oscillation parameters, including a first measurement of δ_{CP} (CP violation parameter). The far detector is a compound of tens of kilotons liquid argon time projection chambers (LArTPC). Two reduce-sized prototypes are operated at CERN. Aside from beam neutrinos measurements, the far detector might be sensitive to supernova neutrinos, typically around 10 MeV. The prototypes allow to study the sensibility to such a signal of the LArTPC technology at large scale. Cosmic muons, abundant at ground level where the prototypes are located, mainly decay to 0-50 MeV electrons (Michel electrons) are an ideal calibration source at the energy range of supernova neutrinos.

Auteur: QUELIN LECHEVRANTON, Jérémy (IJCLab, DUNE)

Orateur: QUELIN LECHEVRANTON, Jérémy (IJCLab, DUNE)

Classification de Session: Neutrino physics

Classification de thématique: Neutrino physics

ID de Contribution: **4** Type: **Non spécifié**

Jet Classification with Particle Transformers: A Multiclass Learning Approach

In high-energy collisions, jets, which are collimated sprays of particles, can originate from various fundamental particles, including W and Z bosons, top quarks, and the Higgs boson. Accurately identifying these jets is crucial for studying Standard Model processes and investigating new physics beyond its framework. This study, conducted within the ATLAS collaboration at the Large Hadron Collider, focuses on multi-class jet tagging utilizing the Particle Transformer (ParT). ParT employs attention mechanisms to capture correlations among jet constituents, the particles that constitute a jet. By representing jets as unordered sets of particles, ParT achieves superior discriminative performance compared to other constituent-based architectures such as ParticleNet and PFN. Its performance is evaluated across multiple jet classes, demonstrating robustness under various Monte Carlo generators and against binary classifiers, thereby showcasing both high accuracy and stability. These findings underline the ability of attention-based transformers to efficiently process unordered data, unveil valuable insights into feature representation, and exhibit satisfactory performance when extended from binary to multi-class jet classification.

Auteur: DUQUE, Andrés (Laboratoire de Physique de Clermont Auvergne)

Co-auteurs: DONINI, Julien (Laboratoire de Physique de Clermont Auvergne); CALVET, Samuel (Laboratoire de Physique de Clermont Auvergne)

Orateur: DUQUE, Andrés (Laboratoire de Physique de Clermont Auvergne)

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **5** Type: **Non spécifié**

Automatizing the search for mass resonances using BumpNet

jeudi 4 décembre 2025 10:45 (25 minutes)

The search for resonant mass bumps in invariant-mass distributions remains a cornerstone strategy for uncovering Beyond the Standard Model (BSM) physics at the Large Hadron Collider (LHC). Traditional methods often rely on predefined functional forms and exhaustive computational and human resources, limiting the scope of tested final states and selections.
This poster presents BumpNet, a Convolutional Neural Network to predict log-likelihood significance values in each bin of smoothly falling invariant-mass histograms. Thereby a model-agnostic search of many final states at once can be performed without the need for traditional background-estimation. The method allows for an exploration of the many unsearched areas of the phase space within the time frame of a traditional analysis of one final state. Training the network on realistic simulated data and smoothly falling functions has led to promising results, such as predicting the correct significance of the Higgs boson discovery, agreement with a previous ATLAS dilepton search, and success in predicting the excess in significance in simulated BSM scenarios. These results highlight the potential for BumpNet to accelerate the discovery of New Physics and motivate current work on implementing this technique in an ATLAS analysis.

Auteur: MAYER, Eva (Université Clermont Auvergne)

Orateur: MAYER, Eva (Université Clermont Auvergne)

Classification de Session: Beyond Standard Model

Classification de thématique: Beyond Standard Model

ID de Contribution: **6** Type: **Non spécifié**

Cherenkov background for high-mass WIMP searches in DarkSide-20k

The nature of dark matter, whose existence is firmly established by astrophysical and cosmological observations, remains one of the most compelling open questions in physics. Among the proposed candidates, Weakly Interacting Massive Particles (WIMPs) are one of the most promising models. They are theoretically motivated by the so-called "WIMP miracle": a weakly interacting, stable particle with electroweak-scale mass naturally accounts for the observed dark matter relic density through thermal freeze-out.

The DarkSide-20k experiment, currently under construction at LNGS, is a next-generation dual-phase Time Projection Chamber containing 51 tons of radiopure argon. Data taking is expected to begin in 2028 and continue for a decade. Its goal is to achieve world-leading sensitivity to both low-mass WIMPs around 1 GeV and high-mass WIMPs above 100 GeV. For the latter, the detection strategy relies on measuring scintillation and ionization signals from particle interactions in liquid argon, enabling 3D reconstruction of the interaction point and fiducialization of the active volume, thereby suppressing external backgrounds.

In this work, I present an overview of the search for high-mass WIMPs with DarkSide-20k, with particular focus on the impact of Cherenkov-induced backgrounds and their implications for the projected sensitivity.

Auteur: PRONESTI, Manuel (CPPM, Aix-Marseille Université, CNRS/IN2P3)

Orateur: PRONESTI, Manuel (CPPM, Aix-Marseille Université, CNRS/IN2P3)

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **7** Type: **Non spécifié**

Developments in b-tagging for the ATLAS upgrade and their impact on di-Higgs sensitivity

lundi 1 décembre 2025 11:40 (25 minutes)

The upcoming High Luminosity LHC (HL-LHC) era is expected to bring opportunities for studies involving rare processes, including di-Higgs production. Flavour tagging is going to play a crucial role in the analysis of such processes. This talk will explore the challenges we expect to encounter for flavour tagging in the HL-LHC era, with its higher luminosity, increased pile-up and upgraded ATLAS detector. The focus will be on the expected behaviour of current flavour tagging neural networks (GN2) when trained and evaluated on simulated Run 4 samples. To determine its performance and robustness against the harsher conditions associated with higher pileup. From this we will be able to compare the same model between Run 3 and Run 4 and produce predictions on the impact this new environment will have on di-Higgs analyses.

Auteur: SPLENDORI, Léonardo (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))

Orateur: SPLENDORI, Léonardo (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **8** Type: **Non spécifié**

b-jet tagging in p-p with Boosted Decision Trees with the ALICE experiment

mercredi 3 décembre 2025 09:00 (25 minutes)

My PhD thesis is the measurement of beauty production in
proton-proton and Pb-Pb collisions with the ALICE experiment at the CERN LHC and my talk will focus on a crucial part in the study of b-jet production: b-jet tagging.

I will compare two methods for b-jet tagging: the Track Counting method which relies on impact parameter significance, and Boosted Decision Trees (a machine learning technique). The comparison relies on two quantities: the efficiency and the purity of the b-jet tagging methods.

I will also mention the use of impact parameter for the rejection of pile-up in the data, as well as pile-up rejection with Boosted Decision Trees.

Auteur: LOTTEAU, CLEMENT

Orateur: LOTTEAU, CLEMENT

Classification de Session: Hadronic Physics

Classification de thématique: Hadronic Physics

ID de Contribution: **9** Type: **Non spécifié**

ATLAS HGTD ALTIROC

vendredi 5 décembre 2025 14:20 (25 minutes)

Timing measurements are critical for the detectors at the future HL-LHC, to resolve reconstruction ambiguity when the number of simultaneous interactions reaches up to 200 per bunch crossing. The ATLAS collaboration therefore builds a new High-Granularity Timing detector for the forward region. A customized ASIC, called ALTIROC, has been developed, to read out fast signals from low-gain avalanche detectors (LGADs), which has 50 ps time-resolution for signals from minimum-ionizing particles. To meet these requirements, a custom-designed pre-amplifier, a discriminator, and TDC circuits with minimal jitter have been implemented in a series of prototype ASICs. The pre-production unit, ALTIROCA, preceded by 4 main prototypes, is designed to contain full functionality. Hybrid assemblies with ALTIROCA ASICs and LGAD sensors have been characterized with charged-particle beams at CERN-SPS and with laser-light injection. The time-jitter contributions of the sensor, pre-amplifier, discriminator, TDC, and digital readout are evaluated.

Auteur: HAMMOUD, Salah El Dine (CNRS - Universite Paris-Saclay - IJCLab/PHE/ATLAS)

Orateur: HAMMOUD, Salah El Dine (CNRS - Universite Paris-Saclay - IJCLab/PHE/ATLAS)

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **10** Type: **Non spécifié**

Freeze-in with low reheating temperature

mercredi 3 décembre 2025 12:05 (25 minutes)

The freeze-in mechanism is an alternative mechanism for dark matter production to standard thermal freeze-out. Freeze-in computations are typically performed assuming a very high initial (”reheating”) temperature. However, this temperature is poorly constrained and can take relatively small values. I will discuss dark matter freeze-in in such a scenario and highlight how dark matter production is impacted compared with the “infinite” reheating temperature case.

Auteur: REGGIO, Thomas (LPCA)

Orateur: REGGIO, Thomas (LPCA)

Classification de Session: Theory

Classification de thématique: Theory

ID de Contribution: **11** Type: **Non spécifié**

Self-interacting neutrinos in light of recent CMB and LSS data

jeudi 4 décembre 2025 09:20 (25 minutes)

We update constraints on a simple model of self-interacting neutrinos involving a heavy scalar mediator with universal flavor coupling. According to past literature, such a model is allowed by Cosmic Microwave Background (CMB) data, with some CMB and large-scale structure data even favoring a strongly-interacting neutrino (SIν) scenario over ΛCDM. In this work, we re-evaluate the constraints on this model in light of the new Planck NPIPE data, DESI BAO data, and the Effective Field Theory of Large Scale Structures (EFTofLSS) applied to BOSS data. We find that Planck NPIPE are more permissive to the SIν scenario and that DESI data favor the SIν over ΛCDM. However, when considering EFTofBOSS data, this mode is no longer preferred. Therefore, new DESI data analyzed under the EFTofLSS are particularly awaited to shed light on this disagreement.

Auteur: POUDOU, Adèle (LUPM)

Orateur: POUDOU, Adèle (LUPM)

Classification de Session: Theory

Classification de thématique: Cosmology

ID de Contribution: **12** Type: **Non spécifié**

The ATLAS High Granularity Timing Detector at the High-Luminosity LHC

jeudi 4 décembre 2025 15:40 (25 minutes)

The upcoming High-Luminosity phase of the Large Hadron Collider (HL-LHC) will deliver unprecedented luminosities, posing significant challenges for particle reconstruction and pile-up mitigation. To preserve excellent tracking and vertexing performance under these conditions, the ATLAS experiment is developing the High Granularity Timing Detector (HGTD), a precision timing layer capable of measuring particle arrival times with ~50 picoseconds resolution.

In this talk, I will introduce you to the HL-LHC motivations and the role of HGTD within ATLAS. I will discuss the detector design and its readout architecture. Finally, I will highlight the contributions of the Laboratoire de Physique de Clermont Auvergne (LPCA) and my own involvement in the project, focusing on the development and validation of the data acquisition chain and system testing.

Auteur: HADDAD, Abdelhamid (LPCA, Université Clermont-Auvergne, CNRS/IN2P3 (FR))

Orateur: HADDAD, Abdelhamid (LPCA, Université Clermont-Auvergne, CNRS/IN2P3 (FR))

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **13** Type: **Non spécifié**

First measurement of the DVCS beam spin asymmetry in the Sullivan process

mercredi 3 décembre 2025 09:25 (25 minutes)

Deeply Virtual Compton Scattering (DVCS) is a powerful tool to investigate the internal structure of hadrons in terms of Generalized Parton Distributions (GPDs). The Sullivan process, involving the exchange of a virtual pion from the proton's meson cloud, offers a unique opportunity to access the three-dimensional structure of the pion at high energies. Since the pion plays a central role in QCD dynamics, being the lightest hadron and the Goldstone boson associated with chiral symmetry breaking, understanding its structure is of fundamental importance for our understanding of hadronic matter.

This work aims at measuring, for the first time, the DVCS beam spin asymmetry (BSA) in the Sullivan process, using data collected with the CLAS12 experiment at Jefferson Lab with a 10.6 GeV electron beam on a proton target. These preliminary results demonstrate the feasibility of this novel measurement, thereby improving our understanding of the Sullivan process and validating this approach as a tool to probe the pion's internal dynamics. This first measurement paves the way for an exploration of the pion structure through its GPDs, and sets the stage for future studies at Jefferson Lab and at the upcoming Electron-Ion Collider.

Auteur: FERRAND, Elouan (DPhN/CEA Saclay)

Orateur: FERRAND, Elouan (DPhN/CEA Saclay)

Classification de Session: Hadronic Physics

Classification de thématique: Hadronic Physics

ID de Contribution: **14** Type: **Non spécifié**

Measurement of the tau polarization and the electroweak mixing angle in Z boson decays to tau leptons

lundi 1 décembre 2025 15:10 (25 minutes)

The CMS collaboration, which analyzes proton-proton collisions at CERN's Large Hadron Collider (LHC), has measured the tau leptons polarization from the decay of Z bosons with LHC Run 2 data from 2016. The polarization (helicity asymmetry) measures the different couplings of the Z boson to left- and right-handed fermions due to its electroweak nature and allows a determination of the effective electroweak mixing angle, one of the fundamental parameters of the Standard Model of particle physics. I will present the methods employed for such a measurement to be achieved and the current contributions being developed to improve the previous result. I am also contributing to the upgrade of the CMS outer tracker for the HL-LHC period and will briefly summarize the irradiation studies I am pursuing at IPHC's cyclotron CYRCé.

Auteur: ESCHENLAUER, Cyril

Orateur: ESCHENLAUER, Cyril

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **15** Type: **Non spécifié**

Non-degenerate low-loss recycling cavities for the gravitational waves detector Virgo

vendredi 5 décembre 2025 13:55 (25 minutes)

In this presentation, I present the optical design of the stable power and signal recycling cavities for the gravitational-wave detector Advanced Virgo+. First, I explain the importance of the stable cavities upgrade for improving the detector's control and noise performances. The optical design of the cavities is developed to fit within the limited infrastructure available at the Virgo site. Using FFT-based simulation tools, we fine-tune the design to minimize optical losses caused by astigmatism and spherical aberration. We then demonstrate that mirror radius-of-curvature errors can be compensated by adjusting the mirrors'positions. A similar technique is applied to correct for thermal effects in the Fabry–Perot cavity mirrors. Finally, we simulate the impact of mirror surface defects on the power recycling gain and signal recycling losses, showing that high gain and low losses can be maintained with the current polishing quality within some constraints on the mirrors'RMS. In addition, we introduce a new method to simulate losses effect on vacuum-squeezed states in the signal recycling cavity - an analysis that was previously not feasible. This technique provides new insights into critical losses to the squeezing system of Advanced Virgo+.

Auteur: AMAR, Ward

Orateur: AMAR, Ward

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **16** Type: **Non spécifié**

Transverse-momentum fraction of strange particles in mini-jets in pp collisions at the LHC with ALICE

mercredi 3 décembre 2025 10:45 (25 minutes)

One of the most intriguing findings from high-energy collisions is strangeness enhancement, which has motivated numerous studies aimed at uncovering its origin. ALICE has previously measured the production rates of (multi-)strange particles in high-energy jets in pp and p–Pb collisions to probe the hadronization mechanism in small systems. In this talk, the average transverse-momentum fraction ($\langle z \rangle$) of strange particles in mini-jets in pp collisions at $\sqrt{s} = 13$ TeV is presented. This measurement employs an innovative angular correlation method that enables access to the low-p_{T} region and provides new insights into the hadronization process in small systems.

Auteur: XU, Lang

Orateur: XU, Lang

Classification de Session: Hadronic Physics

Classification de thématique: Hadronic Physics

ID de Contribution: **17** Type: **Non spécifié**

Semi-Leptonic Vector Boson Scattering in the ATLAS detector

lundi 1 décembre 2025 13:55 (25 minutes)

Vector boson scattering processes are precision probes of the electroweak sector and provide strong sensitivity to new physics that affects gauge and Higgs couplings. Although VBS cross sections in the Standard Model are small, these processes have been observed at the Large Hadron Collider by the ATLAS and CMS experiments. The semi leptonic final state, where one boson decays hadronically to a quark antiquark pair and the other decays leptonically to electrons, muons, or neutrinos, ensures good statistical power and access to multiple coupling structures despite having significantly higher background than purely leptonic channels. At high transverse momentum, VBS provides strong sensitivity to quartic gauge couplings. An interpretation based on Effective Field Theories enables model independent limits on possible deviations from the Standard Model.

Auteur: SALIN, Olivier (Université Paris-Saclay)

Orateur: SALIN, Olivier (Université Paris-Saclay)

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **18** Type: **Non spécifié**

Multivariate analysis of the EW gauge bosons' polarisation at the LHC with the ATLAS experiment

lundi 1 décembre 2025 14:20 (25 minutes)

My thesis subject is the study of the polarisation of electroweak gauge bosons. The longitudinally polarised state is highly correlated to the Goldstone boson, so before the electroweak symmetry breaking, thus allows us to test the limit of the Standard Model prediction. The challenge of this observation of simultaneously produced bosons, called Vector Boson Scattering, is the very low cross-section.

During my PhD, I focused on the development of deep neural network (DNN) optimisation for signal vs background discrimination and polarisation state determination for EW-WZjj. I proved that we can outperform the previous machine learning based method that was present in our framework. I set up the fit with a subset of systematic, and we can compute the significance for the observation of the joint polarisation EW-W0Z0jj as well as the single polarisation state.

This will result in a fit of Run-2 and partial Run-,3, making it the first study on this channel of VBS. The limited statistic is a key concern regarding this analysis and therefore only serves as a first step toward a full measurement using the data of the High-Luminosity LHC, increasing greatly the number of collisions per bunch crossing (pile-up, μ). This new era will bring several upgrades to the ATLAS detector as the replacement of the current Inner Detector by the Inner Tracker, enhancing the coverage in pseudorapidity η up to 4.0 (instead of 2.5).

In this context, I work on my qualification task in order to be a qualified author on the identification of these new forward electrons with a machine learning based technique using the p_T uncorrelation technique, making the output less p_T-dependent. This also comprises a calibration.

Auteur: DUBAU, Mathis (LAPP)

Orateur: DUBAU, Mathis (LAPP)

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **19** Type: **Non spécifié**

Evaluation technico-économique des stratégies de multi-recyclage des matières dans le cycle nucléaire français

vendredi 5 décembre 2025 17:00 (25 minutes)

La composante nucléaire de la transition énergétique en France soulève de nombreuses questions. La prolongation du parc nucléaire historique, la question de la construction de nouveaux réacteurs et la gestion avancée des combustibles usés sont autant de facteurs d'incertitudes, en particulier via leur impact économique sur le coût de la production électrique.

La recherche académique est impliquée depuis les années 90 dans la thématique énergie nucléaire. Parmi les thématiques de recherche se trouve la simulation de réacteurs et la modélisation du cycle du combustible associé. Dans ce contexte, notre équipe a pu développer le code CLASS, un outil de modélisation dynamique du cycle du combustible, permettant l'évaluation technique du déploiement de nouvelles technologies et la gestion du combustible avancée.
Ce modèle est capable d'évaluer l'évolution précise des flux de matière dans un cycle électronucléaire donné, de son démarrage à l'horizon temporel 2050 ou 2100. L'un des objectifs majeurs réalisé lors de cette thèse est l'intégration du calcul du coût de production de l'électricité à l'échelle du cycle. L'originalité de cette approche réside dans le couplage dynamique entre le calcul des coûts et les flux de matières au sein des différents processus industriels, à contrario des modèles statiques classiques à flux de matières fixés.

Cette présentation montre les résultats de l'application de ce modèle à trois scénarios distincts, afin de déterminer la performance du cycle nucléaire français sous différentes configurations. Le premier scénario considère un macro-réacteur PWR UOX sans recyclage des matières. Le second ajoute une macro-réacteur PWR MOX, combiné avec les installations de recyclage du plutonium associées. Enfin, le troisième introduit une configuration plus complexe, avec l'ajout du recyclage de l'uranium en complément.

Les résultats montrent des ordres de grandeur similaires pour les coûts des trois scénarios, malgré un léger surcoût associé au recyclage, en accord avec la littérature académique. Cette modélisation permet de mettre en avant l'impact conséquent du temps de stockage intermédiaire des déchets sur le coût de l'aval du cycle. De plus, elle éclaire que le coût d'extension et de démantèlement des installations reste faible devant les coûts réacteurs et de stockage.

En conclusion, cette étude met en valeur la pertinence d'un couplage dynamique des flux de matière avec la détermination du coût du cycle nucléaire. Les résultats, en accord avec les modèles statiques historiques, permettent l'étude de cycles plus complexes. L'objectif est donc de poursuivre par l'étude de cycles avec multi-recyclage des matières, complexes à évaluer via une approche économique classique.

Auteur: METIVIER, Baptiste (IMT Atlantique)

Orateur: METIVIER, Baptiste (IMT Atlantique)

Classification de Session: Nuclear Physics

Classification de thématique: Nuclear Physics

ID de Contribution: **20** Type: **Non spécifié**

Low-energy neutrinos with DUNE, data reconstruction and analysis with DUNE's Prototypes and sensitivity to solar neutrinos

mardi 2 décembre 2025 17:00 (25 minutes)

The Deep Underground Neutrino Experiment (DUNE) is a next-generation long baseline neutrino experiment. By using Liquid Argon Time Projection Chamber (LArTPC) detectors to detect GeV-scale neutrinos produced by an accelerator, DUNE's main physics goals are to measure the CP-violating phase (δ_{CP}), determine the neutrino mass ordering and resolve the θ_{23} octant. Besides these observations at high energy, DUNE aims to explore the MeV energy range where solar neutrinos and supernovæ neutrinos can be observed. By observing neutrinos coming from the Sun, this experiment will be able to measure Δm^2_{21}, θ_{12} and θ_{13} and to study the thermal internal reactions of our star. DUNE might also be capable of detecting for the first time *hep* neutrinos thanks to the high cross-section of the Charge-Current channel on Argon. In the low-energy regime relevant for solar neutrinos detection, DUNE faces significant backgrounds arising from neutrons, radiogenic gamma rays and cosmogenic isotopes, which must be accurately modeled. After evaluating the backgrounds by means of simulation, signal and background topologies have been studied to develop efficient discrimination techniques, and a passive shielding has been proposed to reduce external backgrounds. To understand detector performance, DUNE has built two full-scale prototypes at CERN, *ProtoDUNE-HD* and *ProtoDUNE-VD*. The first data from *ProtoDUNE-HD* have been used to study the detector response to MeV-scale signals.

Auteur: MARTIN, Maël (LAPP)

Orateur: MARTIN, Maël (LAPP)

Classification de Session: Neutrino physics

Classification de thématique: Neutrino physics

ID de Contribution: **21** Type: **Non spécifié**

Detector Developments For Radiation Physics Applications at GIP ARRONAX.

vendredi 5 décembre 2025 10:45 (25 minutes)

Abstract: The C70XP cyclotron at ARRONAX, located in Saint Herblain [1], is capable of delivering different types of particle beams: Protons and alpha particles up to 70 MeV & deuterons up to 35 MeV. At the cyclotron level, in standard mode, bunches of ions can be delivered with a duration of 3ns separated by 33ns each, and beam intensities ranging from very low (< 1 pA) to very high (up to 350 µA for protons and 70 µA for alpha particles). A chopper device installed in the injection part of the cyclotron allows the adjustment of frequency rates and irradiation durations [2], enabling a wide range of mean dose rates, from low (<1 mGy/s) to high (>1 MGy/s). Various research activities are being conducted in the dedicated AX vault, including preclinical radiotherapy studies, such as investigating the Flash effect on sparing healthy tissues through ultra-high irradiations in short durations, biological sample irradiation [3], radiolysis of water [4] & ion beam analysis of cultural heritage objects [5]. However, for these applications, precise online control of the beam characteristics, such as intensity, geometric profile, and energy, is crucial, and this is achieved through implementing a set of detectors in the beam line.
A Faraday cup is used as a calibration reference, providing an absolute measurement of the beam intensity that is independent of the dose rate. Recently, DIAMMONI*detector, based on 4 single-crystal CVD diamonds, has been developed [6]. It is designed to operate in two complementary modes: train mode, for high flux conditions, where it integrates the total charge per train of bunches (>100 particles per bunch, up to 1 µA) enables halo and precise time measurements (Train duration: DT, inter- train duration: DIT); and bunch mode, for low flux conditions, where it counts the number of particles per bunch (1–100 particles per bunch; <1 nA). An ultra-thin beam profiler PEPITES* (10 µm WET), based on secondary electron emission, has already been developed and installed in the beamline to measure beam profiles at low intensities [7]. It is composed of two segmented electrodes of 32 gold strips of nanometric thickness deposited on a thin polymer membrane (CP1, 1.5µm). In addition, a novel beam profiler based on beam-induced air fluorescence detection with multiple PMTs - allowing simultaneous timing and profile measurements at high intensities- is under development [3], [8].
Thus, the main objectives of our project are to determine the operational ranges, characterize the performances (dose rate response, linearity) of these detectors, and to investigate radiation-induced damage in DIAMMONI & PEPITES, as a function of particle type, energy, and fluence. More specifically, for DIAMMONI we are interested to quantify the charge collection efficiency and the effect of thermal annealing on restoring the detector performance and for PEPITES, to study the impact of radiation damage on the mechanical and electrical properties of the polymer and to enhance the electronic card to operate under ultra-high dose-rate "FLASH"conditions. In parallel, we will finalize the PMTs profiler prototype, quantify its sensitivity and spatial resolution, develop a Python-based simulation model, and validate the simulation by experimental measurements.

Keywords: **Particle Beam; Detectors; Beam Monitoring; Beam Profiler; Dose rate response; Ultra High Dose Rate;Radiation damage**.

DIAMMONI*: ANR-20-CE42-0004*
PEPITES: ANR-17-CE31-0015

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Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **22** Type: **Non spécifié**

Caractérisation d'une ligne de temps de vol pour l'étude des produits de fission symétriques avec le spectromètre LOHENGRIN à l'ILL

vendredi 5 décembre 2025 16:35 (25 minutes)

Présentation de l'intérêt de rajouter une mesure de temps de vol suite a une mesure en spectrométrie pour l'étude de la fission. Présentation du fonctionnement d'une ligne de temps de vol, et de quelques résultats obtenus au laboratoire et à l'ILL.

Auteur: VIEVILLE, Adrien (CNRS -LPSC)

Orateur: VIEVILLE, Adrien (CNRS -LPSC)

Classification de Session: Nuclear Physics

Classification de thématique: Nuclear Physics

ID de Contribution: **23** Type: **Non spécifié**

Study and realization of a High Granularity Timing Detector (HGTD) for the ATLAS detector at the High Luminosity phase of the LHC.

vendredi 5 décembre 2025 11:10 (25 minutes)

The High-Luminosity upgrade of the Large Hadron Collider (HL-LHC) is scheduled to begin colliding protons in 2028. This increase of luminosity will induce a larger number of collisions per beam crossing (around 200). This phenomenon is called the pile-up (μ). A High Granularity Timing Detector (HGTD) has been proposed for the ATLAS experiment to address this new challenges. This new ATLAS sub-detector will improve track reconstruction and enhance pile-up rejection by providing a timing resolution better than 50 ps/track throughout the HL-LHC running period.

The HGTD will consist of around 8000 modules, each composed of LGAD sensors, new read-out chips (called ALTIROC), and module flexes.
For detector assembly and mechanical stability, the modules are glued onto Support Units (SU) to form the Detector Units (DU), a process referred to as loading. The LPNHE has been responsible for developing the loading procedure and will produce 20% of the DUs.

The operational functioning of the DU's is validated through electrical tests. To optimize the Production Phase, the automation of the electrical testing has been developed through the design and implementation of a Graphical User Interface that may be deployed across production sites. HGTD module performances are measured in test beam, where time resolution and sensor efficiency are characterized.

Auteur: PENELAUD, Chloé

Orateur: PENELAUD, Chloé

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **24** Type: **Non spécifié**

Measurement of the electroweak diboson production in the W±Z channel, with the ATLAS detector at LHC

lundi 1 décembre 2025 14:45 (25 minutes)

This presentation summarises the work I have done so far for my PhD. First, the presentation introduces the audience to the VBS process, why it is important and what is its signature in the detector. Then, it proceeds with the QCD background modelling studies that were performed using the MG5_aMC@NLO MC generator. Moreover, it briefly discusses the work I have been doing for my Qualification Project, related to improving diboson simulations. Finally, it shows some preliminary results on Unfolding studies for differential cross section measurements and next steps that need to be taken.

Auteur: ZIAKAS, Panagiotis (L.A.P.P.)

Orateur: ZIAKAS, Panagiotis (L.A.P.P.)

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **25** Type: **Non spécifié**

Etude de phénomènes transitoires à très haute énergie avec le réseau de télescopes H.E.S.S.

mardi 2 décembre 2025 10:45 (25 minutes)

Développée dans les années 1980, l'astronomie à très haute énergie (THE) a connu un bond lors des deux dernières décennies grâce à l'arrivée de la génération actuelle de télescopes tcherenkov à imagerie atmosphérique (IACTs). Le réseau de télescopes H.E.S.S. (High Energy Stereoscopic System), installé en Namibie, a grandement contribué à cet essor.
Parmi les nombreux phénomènes astrophysiques observés par H.E.S.S., certains présentent des variations de flux sur des échelles de temps particulièrement courtes : ils sont appelés phénomènes transitoires. Ces phénomènes trouvent souvent leur source dans des objets compacts ou explosifs (sursauts gamma, éruptions de blazars, etc). Leur étude peut conduire à une meilleure compréhension des processus physiques à l'œuvre au sein des sources astrophysiques les plus énergétiques.
Ma présentation abordera le fonctionnement des IACTs, les différents types de phénomènes transitoires observés à THE, ainsi que les stratégies d'observation et d'analyse mises en place au sein de la collaboration H.E.S.S.. En particulier je présenterai les premiers résultats de mes analyses de deux noyaux actifs de galaxie.

Auteur: PICHARD, Pierre (APC)

Orateur: PICHARD, Pierre (APC)

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **26** Type: **Non spécifié**

Prospect of future neutrino oscillation analysis with T2K's upgraded near detector.

mardi 2 décembre 2025 15:40 (25 minutes)

T2K is a long-baseline experiment measuring neutrino and antineutrino oscillations by observing the disappearance of muon neutrinos, as well as the appearance of electron neutrinos. The ND280 near detector at J-PARC plays a crucial role to minimise the systematic uncertainties related to the neutrino flux and neutrino-nucleus interactions of the un-oscillated neutrino beam. The ND280 detector has recently been upgraded with a new suite of sub-detectors: a high granularity Super-FGD with 2 million optically-isolated scintillating cubes read out by wavelength shifting fibres and 55000 Multi-Pixel Photon Counters; two horizontal Time-Projection Chambers instrumented with resistive Micromegas, and additionally six panels of scintillating bars for precise time-of-flight measurements. These new detectors permit analyses with lower tracking thresholds, full angular acceptance and the measurement of kinematics of neutrons produced in neutrino interactions. Alongside this upgrade, the three magnetic horns that select the charge of the decay hadrons produced at the neutrino beamline had their current increased from 250kA to 320kA, leading to a purer neutrino/anti-neutrino flux. The following talk will focus on the effort done to validate and quantify the effects of those improvements in prospect of future neutrino oscillation analysis.

Auteur: PLANÇON, Jean-Baptiste (Laboratoire Leprince-Ringuet)

Orateur: PLANÇON, Jean-Baptiste (Laboratoire Leprince-Ringuet)

Classification de Session: Neutrino physics

Classification de thématique: Neutrino physics

ID de Contribution: **27** Type: **Non spécifié**

Search for the decay $B \to \tau^+\tau^-$ at BELLE and BELLE II

lundi 1 décembre 2025 16:35 (25 minutes)

Processes involving Flavor Changing Neutral Currents (FCNC), where a B meson undergoes decay into a pair of oppositely charged leptons, serve as potent avenues in the exploration of physics beyond the Standard Model (SM). Notably, the decay $B \to \mu^+\mu^-$ has been observed by LHC experiments, and its measured branching fraction (BF) aligns with the SM prediction, thereby imposing rigorous constraints on theories extending beyond the SM.

Investigations into the tauonic modes $B \to \tau^+\tau^-$, where B can be either a B^0 or B_s^0 meson, become particularly compelling due to indications of lepton flavor nonuniversality hinted from several experiments in $b \to sll$ and $b \to cl\nu$ processes. Models elucidating these anomalies propose that the BF of $B \to \tau^+\tau^-$ modes could exhibit significant enhancements compared to SM predictions, potentially by several orders of magnitude. Only few measurements have been performed on those modes so far, Belle II is expected to improve them significantly.

The Belle II experiment, located at KEK in Japan, began data collection in 2019 with the goal of accumulating the largest statistics of B mesons ever recorded at an e^+e^- collider.
In this talk I will present the status of the analysis performed with both Belle and BelleII dataset.

Auteur: MARFOLI, Mattia (Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France)

Orateur: MARFOLI, Mattia (Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France)

Classification de Session: Flavor Physics

Classification de thématique: Flavor Physics

ID de Contribution: **28** Type: **Non spécifié**

Experimental study of the strong interaction with the spectrometer ALERT and CLAS at JLab

mardi 2 décembre 2025 17:55 (25 minutes)

The ALERT experiment aims to advance our understanding of the nuclear structure in terms of quarks and gluons by precisely measuring the electroproduction of a real photon through the interaction with a nuclear target such as the Helium-4. This process referred as the Deeply Virtual Compton Scattering (DVCS) gives us access to the tomography of quarks inside the nucleus. The achievement of this experiment relies on the synergistic combination of the novel, low-energy ALERT recoil tagger with the CLAS12 spectrometer at Jefferson Lab. The Continuous Electron Beam Accelerator Facilities at Jefferson Lab can deliver 11 GeV spin polarized electron beam. ALERT is composed of a hyperbolic drift chamber for track reconstruction and an array of scintillators for particle identification. It is specifically designed to detect ^{4}He and recoil fragments (p, ^{2}H, ^{3}H, ^{3}He). CLAS12's large acceptance is ideal for the detection of scattered electrons and high energy photons.
After the success of the data taking, from April to September 2025, efforts are now mainly focused on the development of the reconstruction software and the calibration of the data.

Auteur: TOUCHTE CODJO, Félix (PHE/JLab-EIC)

Orateur: TOUCHTE CODJO, Félix (PHE/JLab-EIC)

Classification de Session: Hadronic Physics

Classification de thématique: Hadronic Physics

ID de Contribution: **29** Type: **Non spécifié**

Identification of highly Lorentz-boosted Higgs bosons decaying to ττ jets in the ATLAS experiment

lundi 1 décembre 2025 11:15 (25 minutes)

The Higgs boson pair production (HH) takes center stage in the LHC physics program. Vector Boson Fusion (VBF), the second largest production mode of HH, represents a probe to the Higgs boson doublet structure in the Standard Model and to physics beyond it. Studying HH via VBF is particularly interesting in the boosted topology which is sensitive to anomalous couplings of two Higgs bosons to two vector bosons. However, the low VBF HH cross section, of the order of fb, makes it a very challenging process to analyze that requires high-performance reconstruction and identification techniques to collect as many signal events as possible. In this quest, state-of-the-art machine learning tools brought significant improvements in jet flavour-tagging. To identify boosted $H \to b\bar{b}$ and $H \to c\bar{c}$ decays, reconstructed as single large-radius jets, the GN2X model was developed in ATLAS, based on transformer's features that capture deep correlations between the components of the jet. $H \to \tau^-\tau^+$ events (especially fully-hadronic di-tau decays) also show up as jets in the detector which led to a natural extension of the existing method, called GN2XTau (now GN3X for the latest generation). The performance achieved for the rejection of the main backgrounds is expected to enable an efficient study of highly-boosted $H \to \tau^-\tau^+$ signatures such as those existing in VBF boosted HH production where this method is planned to be applied in future analyses, particularly in one of the most sensitive HH channels, HH $\to b\bar{b}\tau^-\tau^+$.

Auteur: COMBES, Inès (Université Paris-Saclay (IJCLab))

Orateur: COMBES, Inès (Université Paris-Saclay (IJCLab))

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **30** Type: **Non spécifié**

FCC-ee Sensitivity Estimation to the Direct CP-Violating Decay-Rate Asymmetry $A_{C\backslash!P}(D^0 \to \pi^0\pi^0)$

lundi 1 décembre 2025 17:00 (25 minutes)

The Future Circular Collider (**FCC-ee**) is a proposed electron-positron collider designed to enable high-energy collisions at unmatched scales. It is expected to produce $O(10^{12})$ $Z \to q\bar{q}$ events, significantly enhancing our ability to perform **precision measurements** of **electroweak observables**. So far, LHCb has measured **CP violation** in D^0 decays to charged particles. Our understanding of CP violation in the **charm sector** can be further improved by studying the decay mode $D^0 \to \pi^0\pi^0$.

This talk presents a study focusing on the reconstruction of $D^{*\pm} \to (D^0 \to \pi^0(\to \gamma\gamma) + \pi^0(\to \gamma\gamma))\pi^{\pm}$ decays at the FCC-ee to estimate the sensitivity to direct CP violation to complement the knowledge gathered by LHCb with charged modes. Monte Carlo samples, including a simulated detector response based on the **IDEA detector** concept, are used for this purpose. It is demonstrated that the FCC-ee will significantly improve the precision of the measurement of the CP-Violating decay-rate asymmetry $A_{C\backslash!P}(D^0 \to \pi^0\pi^0)$. Furthermore, the reconstruction of this particular decay chain can serve as a benchmark for the **electromagnetic calorimeter** of future electron positron colliders like the FCC-ee, because the reconstruction of neutral pions π^0 is challenging, as identifying the two photons from a single decay requires high angular and **energy resolution**.

Auteurs: WEBER, Willy (LPCA); WEBER, Willy (LPCA)

Orateurs: WEBER, Willy (LPCA); WEBER, Willy (LPCA)

Classification de Session: Flavor Physics

Classification de thématique: Flavor Physics

ID de Contribution: **31** Type: **Non spécifié**

Session Overview

lundi 1 décembre 2025 09:00 (30 minutes)

Orateur: DI GREGORIO, Giulia (IJCLab)

Classification de Session: Standard Model

ID de Contribution: **32** Type: **Non spécifié**

Adaptative readout for CMOS trackers at LHCb

vendredi 5 décembre 2025 11:35 (25 minutes)

With the High Luminosity LHC (HL-LHC) upgrade scheduled for 2030, a major upgrade of the LHCb experiment is planned to adapt to the expected harsh environment. At the Upstream (UP) and MightyTracker (MT) tracking stations, Monolithic Active Pixel Sensors (MAPS) have been chosen for their high resistivity to radiation and their small pixel sizes. This high granularity and the higher pile-up at HL-LHC will considerably increase the data rate generated by these detectors. To fulfill LHCb's design requirements, a data reduction method must be implemented directly at the sensor level. In this work, we propose an improved readout architecture and lossless data format for UP's hottest sensors. Our simulation of this method show that it provides an efficient readout for MAPS at the high particle rates possible in the HL-LHC.

Auteur: CHERIF, Mostafa

Orateur: CHERIF, Mostafa

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **33** Type: **Non spécifié**

Study of cosmic expansion anisotropy with type Ia supernovae from ZTF.

mardi 2 décembre 2025 09:50 (25 minutes)

The cosmological principle assumes the isotropy of the Universe. The high coverage of the Zwicky Transient Facility survey (ZTF) makes it possible to carry out an unprecedented study of the veracity of this principle by using observation of type Ia supernovae (SNe Ia).

This unique low redshift (z<0.15) survey with more than 3000 SNe Ia in the second data release (ZTF-DR2-SNe Ia) increases by a factor 10 the current low-redshift statistics. Its sky coverage, which represents more than the Northern sky, allows to develop new cosmological analysis such as the study a possible anisotropy of H_0. In this talk, I will present a preliminary analysis attending to quantify the sensitivity of detecting anisotropies, like a dipole effect, with realistic simulation reproducing the ZTF-DR2-SNe Ia.

Auteur: BARJOU-DELAYRE, Chloé

Orateur: BARJOU-DELAYRE, Chloé

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Cosmology

ID de Contribution: **34** Type: **Non spécifié**

Transient gamma-ray sky with the future Cherenkov Telescope Array Observatory (CTAO) and validation tests with the NectarCAM camera

mardi 2 décembre 2025 12:00 (25 minutes)

The Cherenkov Telescope Array Observatory (CTAO) is going to consist of more than 60 telescopes in the northern and southern hemispheres, being the largest and most sensitive instrument to gamma rays from 20 GeV to 300 TeV. The arrays will be made of four Large-Sized Telescopes (LSTs) in the Northern Hemisphere, up to 23 Medium-Sized Telescopes (MSTs) distributed over both array sites for its core energy range, and up to 37 Small-Sized Telescopes (SSTs) in the Southern Hemisphere.

The flat-field flasher is a calibration device designed for NectarCAM, the camera that will equip the MSTs of the northern site of the CTAO. Positioned in the centre of the MST dish, 16 meters in front of the camera, the flasher emits short (FWHM < 5\,ns), uniform (2–4\%) light pulses at 390 nm to illuminate the entire focal plane. Accurate calibration is crucial for the optimal operation of NectarCAM, ensuring precise gain computation and mitigating differences in light-collection efficiency of the pixels of the camera. Using the flat-field flasher, two informations are obtained: the pixel gain and the relative efficiency between pixels. The flat-field coefficients are obtained to account for difference in signal between pixels of the camera, these coefficients are then applied within the camera to ensure a uniform response of a few percent across all 1855 pixels. To improve the precision of the computation of the flat-field coefficients, a signal distribution model is applied in order to correct for uncertainties on charge computation. Assuming the light-front shape to be 2D Gaussian, the required control of 2\% over the light front is achieved. Furthermore, the obtained light front parameters show good consistency with the results obtained at a dedicated test bench.

An accurate calibration of the cameras will be crucial for an unbiased reconstruction of gamma-ray energies and thus for the spectral studies of gamma-ray sources. Studies of Active Galactic Nuclei (AGN) constitute one of the Key Science Projects of the CTAO. The long-term monitoring of AGNs aims to measure their duty cycle and to constrain the location the gamma-ray emission regions within these sources. To achieve these scientific objectives within the allocated observation time, the observational program must be carefully optimized based on simulations. In this study, simulated CTAO observations were performed for a selected list of AGNs of interest. The resulting light curves were fitted and analyzed to estimate the excess variance, which serves as a criterion for identifying the most effective observational strategy among four considered scenarios. The ongoing work focuses on refining the selection of the optimal observation cadence and duration, using the flux distribution fitting to determine under which observational conditions different flux variability models can be reliably distinguished.

Auteur: MIKHNO, Anastasiia

Orateur: MIKHNO, Anastasiia

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **36** Type: **Non spécifié**

Towards radiative dipion cross section measurement at Belle II for the g-2

lundi 1 décembre 2025 17:25 (25 minutes)

The g-2 of the muon is one of the oldest (longstanding) potential anomalies in the standard model, although recent theoretical developements synthesized by the g-2 theory initiative and the most precise measurements carried out at Fermilab contributed to a shift in the field's landscape. However, tensions persist and are still very much unresolved in the data driven approach, with recent preliminary results by Babar confirming once more persisting discrepancies between the most precise experimental measurements. The talk will present these (relatively) new developments and expand on the ongoing efforts to provide an independent cross check at Belle II, which has never been realized before.

Auteur: DEMORY, Kylian (IJClab)

Orateur: DEMORY, Kylian (IJClab)

Classification de Session: Flavor Physics

Classification de thématique: Flavor Physics

ID de Contribution: **37** Type: **Non spécifié**

Session overview

mardi 2 décembre 2025 09:20 (30 minutes)

Orateur: BRADASCIO, Federica (IJCLab, Université Paris-Saclay)

Classification de Session: Astroparticle / Cosmology

ID de Contribution: **38** Type: **Non spécifié**

Session overview

jeudi 4 décembre 2025 09:45 (30 minutes)

Orateur: BURGER, Angela (L2I Toulouse, CNRS/IN2P3, Université de Toulouse)

Classification de Session: Beyond Standard Model

ID de Contribution: **39** Type: **Non spécifié**

Session overview

mardi 2 décembre 2025 15:10 (30 minutes)

Orateur: BLANCHET, Adrien (CERN EP-NU)

Classification de Session: Neutrino physics

ID de Contribution: **40** Type: **Non spécifié**

Session overview

lundi 1 décembre 2025 15:35 (30 minutes)

Orateur: LISOVSKYI, Vitalii (Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France)

Classification de Session: Flavor Physics

ID de Contribution: **41** Type: **Non spécifié**

Session overview

mardi 2 décembre 2025 17:25 (30 minutes)

Orateur: AUDURIER, Benjamin (CEA)

Classification de Session: Hadronic Physics

ID de Contribution: **42** Type: **Non spécifié**

Excursion

mercredi 3 décembre 2025 14:00 (4 heures)

ID de Contribution: **43** Type: **Non spécifié**

Invited talk

jeudi 4 décembre 2025 11:35 (55 minutes)

ID de Contribution: **44** Type: **Non spécifié**

Invited talk

jeudi 4 décembre 2025 13:30 (1h 40m)

ID de Contribution: **45** Type: **Non spécifié**

Session overview

vendredi 5 décembre 2025 15:10 (30 minutes)

Orateur: TOCABENS, Guillem (IJCLab)

Classification de Session: Nuclear Physics

ID de Contribution: **46** Type: **Non spécifié**

Session overview

mercredi 3 décembre 2025 11:35 (30 minutes)

Orateur: KRIEWALD, Jonathan (Jožef Stefan Institute)

Classification de Session: Theory

ID de Contribution: **47** Type: **Non spécifié**

Session overview

jeudi 4 décembre 2025 15:10 (30 minutes)

Orateur: AGAPOPOULOU, Christina (IJCLab)

Classification de Session: Instrumentation

ID de Contribution: **48** Type: **Non spécifié**

Development of innovative electronics for a radiometer aimed at axion dark matter searches

jeudi 4 décembre 2025 17:00 (25 minutes)

I am starting my second year thesis at Paris-Saclay university / CEA, within the ERC G-LEAD project, on the development of innovative electronics for a radiometer aimed at QCD axion dark matter searches.
My thesis focuses on developing a radiometer covering a frequency band from 10 GHz to 40 GHz, corresponding to a axion mass range of 50μeV to 150μeV.
This detector is designed to measure an extremely faint signal, on the order of 10^{-26} W/kHz, buried in thermal and electronic noise. It is able of measuring the power frequency spectrum at the output of a horn antenna and a low-noise microwave amplifier chain,both operating in a cryogenic environment.

Auteur: GAUTIER, Morane

Orateur: GAUTIER, Morane

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **49** Type: **Non spécifié**

Fission Yield Analysis of Neutron-Induced Fission on Th-232

vendredi 5 décembre 2025 17:25 (25 minutes)

Thorium-based molten salt reactors have recently attracted increasing interest as one of the promising Generation-IV reactor concepts and as a potentially safer alternative to Uranium-fuelled systems. However, the fission properties of Thorium are still insufficiently understood, particularly due to the limited availability of experimental fission yield data. In this work, we analyze γ-ray spectroscopy data from neutron-induced fission of Th-232 performed with the nu-Ball1 spectrometer at the ALTO facility to obtain its fission fragment yields. The yields were first extracted using a conventional spectroscopy method, and then further improved by introducing a Cf-252-based normalization approach. Using the well-characterized Cf-252 spontaneous fission dataset, we established the fraction of specific γ transitions relative to the total transitions intensity for major isotopes, and applied these ratios to the Th-232 data. This method enables more reliable yield extraction, particularly for odd-Z and odd-A nuclei with complex decay schemes where conventional spectroscopy often fails. The results demonstrate that the Cf-252-based normalization provides a valuable complementary strategy for yield reconstruction, enhancing accuracy for isotopes with complicated level structures.

Auteurs: LIU, Shiyu (IJCLab); Prof. WILSON, Jonathan (IJCLab); Mx THISSE, D.; JOVANCEVIC, N.; CANAVAN, R.; RUDIGIER, M.; LEBOIS, M.

Orateur: LIU, Shiyu (IJCLab)

Classification de Session: Nuclear Physics

Classification de thématique: Nuclear Physics

ID de Contribution: **50** Type: **Non spécifié**

First steps towards detection of the Bc meson in Pb-Pb collisions with the ALICE detector

mercredi 3 décembre 2025 09:50 (25 minutes)

The Quark–Gluon Plasma (QGP) is a deconfined state of matter consisting of quarks and gluons, theorized to have existed during the earliest moments after the Big Bang. Hadronisation refers to the process by which quarks combine to form composite particles known as hadrons. Studying how hadronisation occurs within the QGP provides valuable insights into how the first particles in our Universe emerged from the high-energy primordial matter present immediately after the Big Bang.
In laboratory settings, high-energy lead–ion collisions can recreate tiny droplets of QGP, as achieved at the Large Hadron Collider (LHC). A particularly interesting approach involves studying heavy quarks (charm and beauty) as they are only produced in the initial collisions and persist throughout the entire evolution of the QGP. Previous research has shown that the production of J/ψ mesons (hadronised charm–anticharm pairs) can be either enhanced (regeneration) or suppressed depending on the QGP's temperature. A new study proposes to investigate the Bc meson (a bound state of a beauty and a charm quark) with the ALICE detector to gain deeper insight into the mechanisms of heavy-quark hadronisation within the QGP, as it is especially sensitive to the regeneration mechanism.
In this talk I will discuss the challenges of detecting the Bc with the ALICE detector and the steps which have already been made. In addition, I will show advancements with prompt/non-prompt J/ψ seperation in O-O collisions at the LHC, as a middle-ground between pp and Pb-Pb.

Auteur: VEEN, Paul (Paris-Saclay/CEA)

Orateur: VEEN, Paul (Paris-Saclay/CEA)

Classification de Session: Hadronic Physics

Classification de thématique: Hadronic Physics

ID de Contribution: **51** Type: **Non spécifié**

A new era for multi-wavelength studies of blazars with Rubin and the CTAO

mardi 2 décembre 2025 11:10 (25 minutes)

Both the Rubin Observatory and the first telescopes of the CTAO will be collecting data by 2026, marking a new era in optical and gamma-ray astronomy. Compared to predecessors like the ZTF, H.E.S.S., MAGIC, and VERITAS, their enhanced sensitivity will extend extragalactic observations to a redshift of at least $\sim$2.5. This advancement offers fresh insights into non-thermal astrophysical sources, particularly blazars - radio-loud Active Galactic Nuclei with jets aligned with our line of sight. The 3-night cadence monitoring with Rubin, in one of its six filters, will produce blazar light curves that, when combined with targeted in-depth observations from the CTAO, could help distinguish acceleration and radiative models, which are still under debate. Existing data from the ZTF and \textit{Fermi}-LAT, though less sensitive, offer preliminary insights into what Rubin and the CTAO may achieve. However, the real-time processing of the immense data stream coming from Rubin/LSST presents a major challenge.

Addressing this challenge is the work of brokers such as Fink, which we develop for multi-messenger astrophysics. Fink processes data in real-time before sending relevant information to other observatories like the CTAO. In this contribution, we present how we characterize the optical variability of blazars that emit in the gamma-ray range using the ZTF, with timescales spanning from the intra-night to multi-years. We identify properties in the resulting parameter space that could not only enable the identification of blazar-like sources, but also the characterization of the continuum of states. We describe our fast identification of transitions from one state to another, enabling the trigger of observations in the gamma-ray band when the blazar is flaring and of spectroscopic observations with the goal to measure the redshift of the source when the jet becomes faint and the host galaxy may become detectable. Finally, we review the communication channel we set from the ZTF to the CTAO via Fink for blazars and discuss its outlook in light of the Rubin Observatory. This method is also applicable to other astrophysical sources and helps lay the groundwork for a fruitful era for time-domain astronomy.

Auteur: HAMO, Julian (IJCLab)

Orateur: HAMO, Julian (IJCLab)

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **52** Type: **Non spécifié**

Search for $B_s \to K\pi\pi^0$ decay mode using LHCb Run 2 Data

lundi 1 décembre 2025 17:50 (25 minutes)

The Standard Model of Particle Physics explains successfully the fundamental interactions between particles of ordinary matter. However, it is incomplete, as it cannot explain neutrino masses nor cosmological observations such as matter-antimatter asymmetry in the Universe or the origin of dark matter. Physics beyond the Standard Model is either searched for production of new particles via high energy collisions or from physics happening at the intensity frontier. The indirect approach provides accurate measurements of the Standard Model parameters to confront theory and studied process where virtual new particles could contribute.

The analysis, carried out in collaboration with physicists from Pekin, UCAS and Wuhan universities aims to provide precise measurements of the branching fractions of b-hadron such as $B^0_{(s)}$ and Λ_b baryon into h+h-π^0 final states, where h can either be protons, pions or kaons. These charmless b-quark transitions are dominantly proceeding through loop diagrams in the SM and can embody in principle Beyond Standard Model amplitudes.

This presentation will outline the search of the $B_s \to K\pi\pi^0$ decay mode using samples collected during data taking in the years 2016-2018 at LHC pp collider. Dedicated multivariate tools are used to select signal candidates where each particle is correctly identified and reject combinatorial background coming from random combination of unrelated particles. The main selection procedure, the contribution of background sources and the fitting strategy will be discussed.

Auteur: GUERRY, Laetitia

Orateur: GUERRY, Laetitia

Classification de Session: Flavor Physics

Classification de thématique: Flavor Physics

ID de Contribution: **53** Type: **Non spécifié**

Pulse Shape Discrimination in Liquid Argon and its application in background rejection for the DarkSide20 Dark Matter experiment.

mardi 2 décembre 2025 11:35 (25 minutes)

The DarkSide20k experiment is a direct Dark Matter detector focused on the search for WIMP dark matter. Its main component is a dual-phase Argon Time Projection Chamber (TPC). Here, particles are detected from collisions with Argon atoms and the subsequent emission of scintillation light as well as ionisation electrons. Since the rate of signal events is expected to be much lower than background events, understanding and rejecting the background is crucial.

A major advantage of Argon is the ability to discriminate between electron and nuclear recoil events based on the time profile of the scintillation pulse. This technique is called Pulse Shape Discrimination. In my presentation I will present aspects of the PSD technique as well as its importance within the analysis framework of the experiment and the projection of sensitivity limits.

Auteur: MACHTS, Janna

Orateur: MACHTS, Janna

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **54** Type: **Non spécifié**

Impact of extreme ultraviolet radiation on the scintillation of pure and xenon-doped liquid argon

jeudi 4 décembre 2025 16:35 (25 minutes)

The X-ArT (Xenon-Argon Technology) collaboration has studied the scintillation mechanisms in pure and Xe-doped liquid argon (LAr) using silicon photomultipliers sensitive to different wavelength ranges. Thanks to our measurements we identified a long-lived (>10μs) component attributed to extreme ultraviolet (EUV) photons emitted by the metastable levels of atomic argon. Based on this observation we developed a Xe-Ar scintillation model that includes both the EUV radiative contribution and the traditional collisional transfer process. Moreover we explored how the scintillation light yield and pulse shape discrimination vary as a function of the xenon concentration. Finally we proposed the EUV component as a possible source of the spurious electron emission in pure liquid argon, the main background in the search of light dark matter with noble liquid TPCs.

Auteur: NIKOLOUDAKI, Evangelia (APC)

Orateur: NIKOLOUDAKI, Evangelia (APC)

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **55** Type: **Non spécifié**

Scalar waves beyond eikonal approximation

jeudi 4 décembre 2025 08:55 (25 minutes)

The propagation of gravitational waves shares formal similarities with that of light. However, their typically much larger wavelengths render the geometric optics —or eikonal —approximation insufficient when considering propagation in curved spacetime. The purpose of this thesis is to establish a systematic framework that goes beyond this approximation, and to assess its implications for the deflection and magnification of waves passing near a black hole. We begin by examining the case of a scalar wave, before extending the analysis to electromagnetism, and ultimately to gravitational waves, while fully accounting for their tensorial structure.
To understand the basis of the problem and the structure of the equations we first study the case of a propagating scalar field lensed by a point like lens.

In this talk I will present the formalism used and the structure of the equations, along with some numerical results and analytical insights.

Auteur: BRUYERE, Emma (IAP)

Orateur: BRUYERE, Emma (IAP)

Classification de Session: Theory

Classification de thématique: Theory

ID de Contribution: **56** Type: **Non spécifié**

Constraining Optical Model Potentials for p-process Nucleosynthesis through Elastic Scattering on 144Sm and 148Sm

vendredi 5 décembre 2025 15:40 (25 minutes)

Nucleosynthesis is the branch of physics that studies the creation sites and mechanisms of the elements present in our universe. The synthesis of the proton-rich stable isotopes heavier than iron, known as the p-nuclei, remains one of the open questions in nuclear astrophysics. Their production in high-temperature stellar environments critically depends on reaction rates involving α-induced channels, which are themselves governed by the α-nucleus optical model potential (AOMP). However, significant discrepancies persist between existing global AOMPs, leading to large uncertainties in astrophysical network calculations.

In this talk, I will introduce the experiment carried out by our team, which is the α-elastic scattering on ^{144}Sm and ^{148}Sm at incident energies around 20 MeV, measured at the ALTO facility (Orsay). The comparison of these two isotopes is central to the study: ^{144}Sm is semi-magic (N = 82), and most modern AOMPs are fitted or benchmarked using elastic data from such nuclei, while ^{148}Sm is not magic. This structural contrast provides a stringent test of the sensitivity and transferability of current AOMPs when applied beyond the semi-magic region. Furthermore, the data allow us to constrain the cross-section ratio between the first excited state and the ground state in ^{148}Sm, providing additional information on coupling effects and reaction channel strengths.

Auteur: SOTO, Charles

Orateur: SOTO, Charles

Classification de Session: Nuclear Physics

Classification de thématique: Nuclear Physics

ID de Contribution: **57** Type: **Non spécifié**

Electron Trigger Performance and Efficiency Measurements in ATLAS Run 3

lundi 1 décembre 2025 09:30 (25 minutes)

Electron triggers are responsible for selecting events resulting of proton-proton collisions at the Large Hadron Collider and their performance is a key ingredient for many physics analyses with the ATLAS detector. This work presents recent studies of Run3 electron trigger efficiencies and the corresponding scale factors, which correct for small differences between data and simulated events. Efficiencies are obtained with the Tag&Probe method, using well-known physics processes such as the decay of the Z bosons to provide unbiased electron samples. Scale factors are then derived and provided as functions of kinematic and detector variables, ensuring reliable corrections to be used in physics analyses over a broad kinematic range.

Auteur: DUONG, Timoty

Orateur: DUONG, Timoty

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **58** Type: **Non spécifié**

Jet Classification with Particle Transformers: A Multiclass Learning Approach

lundi 1 décembre 2025 10:50 (25 minutes)

In high-energy collisions, jets, which are collimated sprays of particles, can originate from various fundamental particles, including W and Z bosons, top quarks, and the Higgs boson. Accurately identifying these jets is crucial for studying Standard Model processes and investigating new physics beyond its framework. This study, conducted within the ATLAS collaboration at the Large Hadron Collider, focuses on multi-class jet tagging utilizing the Particle Transformer (ParT). ParT employs attention mechanisms to capture correlations among jet constituents, the particles that constitute a jet. By representing jets as unordered sets of particles, ParT achieves superior discriminative performance compared to other constituent-based architectures such as ParticleNet and PFN. Its performance is evaluated across multiple jet classes, demonstrating robustness under various Monte Carlo generators and against binary classifiers, thereby showcasing both high accuracy and stability. These findings underline the ability of attention-based transformers to efficiently process unordered data, unveil valuable insights into feature representation, and exhibit satisfactory performance when extended from binary to multi-class jet classification.

Auteur: DUQUE, Andrés (Laboratoire de Physique de Clermont Auvergne)

Co-auteurs: DONINI, Julien (UBP/LPC/IN2P3); CALVET, Samuel (Laboratoire de Physique de Clermont Auvergne)

Orateur: DUQUE, Andrés (Laboratoire de Physique de Clermont Auvergne)

Classification de Session: Standard Model

Classification de thématique: Standard Model

ID de Contribution: **59** Type: **Non spécifié**

Preliminary measurement of the germanium ionisation yield and first studies of the new silicon crystal detectors of the Ricochet experiment

vendredi 5 décembre 2025 12:00 (25 minutes)

Coherent elastic neutrino nucleus scattering (CEvNS) was first measured experimentally by the COHERENT experiment in 2017 and is currently being studied by many experiments all around the world. In this context, the Ricochet international collaboration aims to detect the CEvNS process in order to search for new physics. The detectors used are germanium crystals operated at cryogenic temperatures, which can simultaneously readout the ionization and heat energies resulting from particle interactions occurring in the crystal.This dual measurement allows both particle identification, by discriminating between electronic and nuclear recoils, and determination of the recoil energy of the interactions. This presentation focuses on a preliminary study dedicated to measure the ionization yield of nuclear recoils in germanium detectors at the keV energy scale, based on the first commissioning data from the Ricochet experiment. Furthermore, as the Ricochet experiment is planning to use silicon as a new crystal material, this presentation is also covering the first hardware developments and preliminary performance analysis of the silicon detectors.

Auteur: LE BELLEC, Tatiana (IP2I)

Orateur: LE BELLEC, Tatiana (IP2I)

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **60** Type: **Non spécifié**

Étude de l'impact de la précision temporelle du prototype T-SDHCAL dans la reconstruction des jets.

jeudi 4 décembre 2025 17:25 (25 minutes)

Dans le cadre des projets de collisionneurs leptoniques futurs, un prototype de calorimètre hadronique ultra granulaire, le SDHCAL, a été réalisé à l'IP2I.
Pour les projets de collisionneurs leptoniques circulaires comme le FCC et le CEPC, il est proposé d'adjoindre au SDHCAL une capacité de mesures précises du temps pour former un calorimètre ultra granulaire en temps et espace. Cette évolution est nommée T-SDHCAL. Le prototype T-SDHCAL est constitué de MGRPC (chambres à plaques résistives en verre multicouches) de 1 m2 positionnées tous les 2,5 cm et embarquant une électronique de lecture fournissant une segmentation en carreau de 1 cm2 et une précision temporelle de quelques dizaines de picosecondes.
Cette présentation portera sur l'étude de la classification proton/pion (PID) par méthode de Machine Learning dans le but d'améliorer la reconstruction en énergie dans le prototype T-SDHCAL.

Auteur: VAGINAY, William (CNRS - IP2I)

Orateur: VAGINAY, William (CNRS - IP2I)

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **61** Type: **Non spécifié**

3γ Imaging with ^{44}Sc: PMT Calibration and Data Processing in Xemis 2

jeudi 4 décembre 2025 17:50 (25 minutes)

The new 3γ imaging technique, based on the use of the radionuclide 44Sc, enables the direct three-dimensional reconstruction of a radioactive source from the simultaneous detection of three gamma photons. This approach has the potential to reduce both acquisition time and injected activity compared to conventional nuclear imaging methods. To investigate this concept, a liquid xenon Compton telescope named XEMIS2 is currently under development. The assembly and calibration of the detector are nearing completion, and dedicated data analysis tools are being designed to process raw signals into reconstructed images.This contribution focuses on the calibration of the photomultiplier tubes (PMTs) and the development of the dedicated data processing chain between the ouput of the camera and the input of the reconstruction algorithm.

Auteur: RAMSI, Yohann (subatech)

Orateur: RAMSI, Yohann (subatech)

Classification de Session: Instrumentation

Classification de thématique: Instrumentation

ID de Contribution: **62** Type: **Non spécifié**

High energy follow-up of transient sources with H.E.S.S.

mardi 2 décembre 2025 13:55 (25 minutes)

Multi-wavelength and multi-messenger astrophysics have experienced remarkable growth over the past decade, aiming to build a comprehensive picture of various cosmic phenomena. Transient sources, in particular, greatly benefit from the complementary information provided by multi-messenger observations, both enhancing follow-up of rapidly fading signals and allowing for a better physical understanding of the event.

Gravitational wave (GW) detections act as ideal triggers for searches of electromagnetic counterparts. A GW event may, for instance, be associated with a Gamma-Ray Burst (GRB), a jetted cataclysmic phenomenon produced either by binary neutron star mergers or core-collapse supernovae. Such sources emit across the electromagnetic spectrum, enabling their discovery with X- and gamma-ray space instruments and offering valuable multi-wavelength follow-up opportunities. The need to capture the full temporal evolution of these rapid emissions, coupled with the often broad localization areas of GW alerts, highlights the importance of fast, coordinated response strategies and real-time information tools.

This contribution presents the H.E.S.S. follow-up framework for the GW and GRB alerts. I will show representative follow-up examples, emphasizing key results and challenges in the search for high-energy gamma-ray counterparts. Furthermore, I will introduce Astro-COLIBRI, a dedicated platform for real-time coordination and visualization of multi-messenger information, designed to support rapid response in the time-domain astrophysics era.

Auteur: CORNEJO, Bernardo (CEA - Irfu)

Orateur: CORNEJO, Bernardo (CEA - Irfu)

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **63** Type: **Non spécifié**

Enhancing MBTA Efficiency and Template Banks Generation for Sub-Solar-Mass Black Hole Searches

mardi 2 décembre 2025 14:20 (25 minutes)

The first direct observation of gravitational waves (GW) in 2015 by the LIGO/Virgo/Kagra (LVK) collaboration opened a new era of astronomy. The GW group at IP2I in Lyon contributes to both the analysis of interferometers data and the characterization of the VIRGO detector. Most gravitational-wave online search pipelines rely on matched filtering (MF), a method which compares the data to a large set of theoretical waveforms, called templates. The Multi-Band Template Analysis (MBTA) is one of those MF-based pipelines. It filters data across several frequency bands in parallel, thus cutting down the computational overhead induced by MF. This algorithm, on the other hand, relies on more complex sets of template banks, covering the phase space over different frequency bands. My work focuses on simplifying and accelerating template bank production for MBTA, and on exploring strategies to improve MBTA's efficiency in detecting sub-solar-mass black hole binaries.

Auteur: JOUBERT, Gaspard

Orateur: JOUBERT, Gaspard

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **64** Type: **Non spécifié**

Autonomous radio-detection of cosmic rays with GRANDProto300

mardi 2 décembre 2025 14:45 (25 minutes)

The Giant Radio Array for Neutrino Detection (GRAND) is a project aiming at the detection of ultra-high-energy (UHE) cosmic rays, gamma rays and neutrinos through the radio emission produced by extensive air showers in the atmosphere. It consists of a network of autonomous radio antennas deployed over large areas in radio-quiet, mountainous regions, using the surrounding topography as a target for Earth-skimming neutrinos. By exploiting the large instantaneous field of view of sparse radio arrays, GRAND is designed to reach an unprecedented exposure at energies above
10^{17} eV, opening a new window on the origin and composition of UHE cosmic rays, the flux of cosmogenic neutrinos expected from interactions of the highest-energy particles with cosmic backgrounds, the diagnosis of astrophysical neutrino sources, and tests of fundamental physics. In this contribution we present the GRAND detection concept and analysis chain, and we introduce the first cosmic-ray air showers detected with GRANDProto300 a sub-array stage of the experiment. These events validate the autonomous trigger, timing and direction reconstruction, and radio-background rejection strategies, and demonstrate the capability of GRAND-like arrays to deliver high-quality measurements of inclined air showers, paving the way toward the next stages of the experiment.

Auteur: LEBAS, Nathan

Orateur: LEBAS, Nathan

Classification de Session: Astroparticle / Cosmology

Classification de thématique: Astroparticle

ID de Contribution: **65** Type: **Non spécifié**

Hadronic talk #6

Orateur: LAMBERT, Stanislas

Classification de Session: Hadronic Physics

ID de Contribution: **67** Type: **Non spécifié**

Toward a New Measurement of the Neutron Electric Dipole Moment at the n2EDM Experiment

jeudi 4 décembre 2025 11:10 (25 minutes)

The Standard Model (SM) of particle physics successfully describes most observed phenomena, yet it fails to explain the matter-antimatter asymmetry in the Universe. This discrepancy suggests the existence of new sources of CP violation beyond those present in the SM. The neutron Electric Dipole Moment (nEDM) is a powerful observable for searching for new physics, as it is highly sensitive to CP-violating interactions at energy scales far beyond the reach of current colliders.

The n2EDM experiment, currently under development, aims to improve the sensitivity to the nEDM by one order of magnitude compared to the collaboration's prior measurements. This talk will discuss the motivation for searching for new CP-violating processes, the unique role of the nEDM as a probe of beyond-SM physics, and the current challenges faced by the n2EDM experiment in achieving its ambitious goals.

Auteur: VEZON, Antoine (LPC CAEN)

Orateur: VEZON, Antoine (LPC CAEN)

Classification de Session: Beyond Standard Model

Classification de thématique: Beyond Standard Model

ID de Contribution: **68** Type: **Non spécifié**

Measurement of Y(nS) and prompt/non-prompt J/ψ fraction at forward rapidity in pp collisions at √sNN = 13.6 TeV with ALICE & Tuning of detector response and noise in MC simulations

mercredi 3 décembre 2025 11:10 (25 minutes)

The quark-gluon plasma (QGP) is a state of matter at high temperatures and/or high baryon density where quarks and gluons are asymptotically free and not confined in hadrons anymore. Experimentally, it can be produced
during heavy ion collisions using large accelerator facilities such as the LHC. The ALICE experiment focuses on characterizing the QGP properties using
the aforementioned collisions and produced probes such as hadrons, leptons or photons. One privileged hard probe are the Quarkonia, bound states of a heavy quark (charm or beauty) and its anti-quark, because they are experiencing the full history of the collision.
ALICE underwent an upgrade in LS2 and is now in continuous readout configuration. This came with important changes within the Muon Spectrometer electronics which imply, for example, proper tuning of the tracking chamber response. Those tunings are important for the clustering algorithm and Monte-Carlo productions as it can improve the resolution of the signal and the detector efficiency. A method to retrieve the intrinsic noise of the pads from the Cathode Pads Chamber is proposed and compared with the current tuning used for data-taking.
The observation of the bound states J/ψ and Y(nS) via their muonic decay channel will be conducted using the ALICE Muon Spectrometer. The J/ψ production in pp collision comes from two main sources. The first one is the prompt composed of J/ψ created directly at the collision or J/ψ from decay of heavier charmonium states such as χc or ψ(2s) (feed-down process). The second one is the non-prompt containing J/ψ resulting from the decay of b hadrons.
Thanks to the addition of the Muon Forward Tracker (MFT) in ALICE Run 3,
it is now possible to separate the aforementioned sources in the J/ψ production.
As for the inclusive Y(nS) states, they are measured in the same forward pseudo-rapidity as the prompt/non-prompt J/ψ ($-3.6 < |\eta| < -2.5$) using 2024 data
collected by ALICE in proton-proton collisions at $\sqrt{s} = 13.6$ TeV.
Measuring at the same time non-prompt J/ψ and Y will allow to constraint the open charm over open beauty production. This analysis will pave the way for similar studies in heavy-ions collisions.

Auteur: LAMBERT, Stanislas

Orateur: LAMBERT, Stanislas

Classification de Session: Hadronic Physics

Classification de thématique: Hadronic Physics

ID de Contribution: **69** Type: **Non spécifié**

Neural Simulation Based Inference for Constraining Higgs self-coupling with HH->bbyy at ATLAS experiment

lundi 1 décembre 2025 09:55 (25 minutes)

The ATLAS experiment has published measurement of Higgs trilinear self-coupling with LHC Run 2 + partial Run 3 data, reaching a range of -1.7 < κ_λ < 6.6 ; but the core algorithm for statictical inference is a $m_{\gamma\gamma}$ histogram-based fit, which is not optimal given the κ_λ is non-linear to the signal strength. Motivated by the drawback of histogram analysis, we present an improved algorithm – Neural Simulation Based Inference (NSBI) to study the constraint on κ_λ. The NSBI method depends on multi-dimentional, minimal-biased estimation of the likelihood ratio for signal and background components, by training a set of classificational neural networks. This works can serve as input to an analysis with full Run 2 + Run 3 LHC data.

Co-auteurs: ROUSSEAU, David; FAYARD, Louis

Orateurs: ROUSSEAU, David; FAYARD, Louis; LIU, Zirui (IJCLab)

Classification de Session: Standard Model

ID de Contribution: **70** Type: **Non spécifié**

Conclusion talk

vendredi 5 décembre 2025 22:00 (20 minutes)

Orateurs: GOUDELIS, Andreas (LPC - Clermont Ferrand); Dr URAS, Antonio (IP2I Lyon); D'ERAMO, Louis (LPCA - Clermont); DELORME, Rachel (LPSC, Grenoble); STREBLER, Thomas (CPPM, Aix-Marseille Université, CNRS/IN2P3 (FR))