Mardi 16 Avril 2024

Day 1 - Session 1: 10h00 – 12h00 • Amphi Dirac

2nd Year PhD Series 2023/24

Ginevra DE LAURETIS – Groupe Neutrinos

Neutrino energy reconstruction from final state particles and effects related to the simulation of the physics of neutrino interactions in DUNE

DUNE is a next generation front edge long baseline neutrino experiment which will exploit a wide-band neutrino beam and the energy spectrum information at the level of both the 1st and 2nd oscillations maxima in order to achieve its sensitivity to CP violation. The reconstruction of the final states of the neutrino interactions is crucial to exploit the oscillated energy spectrum information.

This study is investigating the neutrino energy reconstruction in DUNE starting from final state particles, and on how this is affected by the neutrino interactions physics and modelling. The primary aim consists in optimizing the energy resolution at low energy, at the second oscillation maximum, in order to further enhance the CP sensitivity. Different event generators as GENIE and GiBUU are compared investigating several aspects, such as the interplay of different processes from quasi-elastic, resonances to deep inelastic scattering.

David AMRAM – Groupe CMS

Testing global symmetries of the Standard Model in the top quark sector

The pursuit of deviations from the Standard Model (SM) is prompted by the recognition of the model's known limitations. Some findings suggest possible violations of lepton flavor universality. The identification of such deviations could potentially lead to a SM extension, adding Z' boson that interacts with leptons in a different manner.

The SM is also firmly grounded by the principle of Lorentz invariance. Nevertheless, some theories predict a non-conservation of this symmetry, a possibility considered within the framework of the Standard Model Extension (SME).

In this presentation, I will share my research on testing these symmetries. Firstly, I will discuss my work regarding the search for lepton universality violations in $ttZ \rightarrow l^+l^-$ decays using CMS data. Next, I will present my result on the test of Lorentz invariance by analysing photon decays in vacuum at the Large Hadron Collider (LHC)

Alfred BOVON – Groupe Théorie

SO(9) supergravity in the context of matrix model holography

In this presentation, I will try to present you the formalism of holographic renormalization for the matter-coupled two-dimensional maximal supergravity, with fluctuations around a D0-brane near-horizon geometry background in the context of AdS/CFT correspondence.

We will discuss the generalisation of its supersymmetric SO(3)xSO(6) deformation to any SO(p)xSO(9-p) deformation with p between 1 and 8. As an application, I will present results of holographical computations of two-point functions, for fluctuations in both the dilaton and axion sector.

Lien agenda: https://indico.in2p3.fr/event/32777/