Blois 2017: 29th Rencontres de Blois on "Particle Physics and Cosmology"

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Parallel Session QCD+HF / **37**

PERSPECTIVE STUDY OF CHRMONIUM, EXOTICS AND BARYONS WITH CHARM AND STRANGENESS

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The spectroscopy of charmonium-like states together with the spectroscopy of charmed and strange baryons is discussed. It is a good testing tool for the theories of strong interactions, including: QCD in both the perturbative and non-perturbative regimes, LQCD, potential models and phenomenological models [1, 2, 3]. An understanding of the baryon spectrum is one of the primary goals of non-perturbative QCD. In the nucleon sector, where most of the experimental information is available, the agreement with quark model predictions is astonishingly small, and the situation is even worse in the strange and charmed baryon sector. The experiments with antiproton-proton annihilation and proton-proton collisions are well suited for a comprehensive spectroscopy program, in particular, the spectroscopy of charmonuim-like states and flavour baryons. Charmed and strange baryons can be produced abundantly in both processes, and their properties can be studied in detail [1, 2, 3].

For this purpose an elaborated analysis of charmonium and tetraquark spectrum together with spectrum of charmed and strange baryons is given. The recent experimental data from different collaborations are analyzed. A special attention was given to the recently discovered XYZ-particles. The attempts of their possible interpretation are considered [4 - 7]. The results of physics simulation are obtained. Some of these states can be interpreted as higher lying charmonium and tetraquarks with a hidden charm. It has been shown that charge/neutral tetraquarks must have their neutral/charged partners with mass values which differ by few MeV. This hypothesis coincides with that proposed by Maiani and Polosa [8]. Many heavy baryons with charm and strangeness are expected to exist. But much more data on different decay modes are needed before firmer conclusions can be made. These data can be derived directly from the experiments using a high quality antiproton beam with momentum up to 15 GeV/c planned at FAIR and proton-proton collisions with momentum up to 26 GeV/c planned at NICA.

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PERSPECTIVE STUDY OF CHRMONIUM, EXOTICS AND BARYONS WITH CHARM AND STRANGENESS

Subject:

QCD+Flavour

Parallel Session Neutrinos / 38

Background free search for neutrinoless double beta decay with GERDA Phase II

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The observation of neutrinoless double beta ($0\nu\beta\beta$) decay would prove lepton number violation and would shed light onto the nature of neutrinos. The GERDA experiment is aiming to perform a background free search for this process in ^{76}Ge by operating isotopically enriched high purity Germanium detectors bare in liquid argon. Phase II of the experiment combines for the first time the excellent properties of semiconductor Germanium detectors with an active background suppression

technique based on the simultaneous detection of liquid argon scintillation light by photomultiplier tubes and silicon photomultipliers coupled to scintillating fibers (LAr veto).

This talk outlines the Phase II upgrade with special emphasis on background rejection techniques and focusses on the first results of Phase II. Exhibiting the world-best background index (if normalized to the narrow energy-signal region of Germanium detectors), a limit on the $0\nu\beta\beta$-decay half-life of ^{76}Ge of $5.3 \cdot 10^{25}$ yr at 90% C.L. could be set based on an exposure of only 34.4 kg·yr. With an ultimate exposure of 100 kg·yr this will allow for a $0\nu\beta\beta$-decay half-life sensitivity of the GERDA Phase II experiment of 10^{26} yr.

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Background free search for neutrinoless double beta decay with GERDA Phase II

Subject:

Neutrinos

Parallel Session Neutrinos / **39**

Electromagnetic properties of neutrino

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A review of the theory and phenomenology of neutrino electromagnetic properties is presented. A massive neutrino even in the easiest generalization of the Standard Model inevitably has nonzero electromagnetic characteristics, at least nonzero magnetic moment. Although its value, determined by the neutrino mass, is very small, in other BSM theories, as for example the supersymmetric models, much larger values of magnetic moments are predicted.

Derivation of the general structure of the electromagnetic interactions of Dirac and Majorana neutrinos is presented. Then we discuss experimental constraints on neutrino magnetic and electric dipole moments, electric millicharge, charge radius and anapole moments from the terrestrial laboratory experiments. A special credit is done to bounds on neutrino magnetic moments obtained by the reactor (MUNU, TEXONO and GEMMA) and solar (Super-Kamiokande and Borexino) experiments. The effects of neutrino electromagnetic interactions in astrophysical environments are also reviewed. The main manifestation of neutrino electromagnetic interactions, such as: 1) the radiative decay in vacuum, in matter and in a magnetic field, 2) the Cherenkov radiation, 3) the plasmon decay, 4) spin light in matter, 5) spin and spin-flavour precession, 6) neutrino pair production in a strong magnetic field, and the related processes along with their astrophysical phenomenology are also considered. The best world experimental bounds on neutrino electromagnetic properties are confronted with the predictions of theories beyond the Standard Model. It is shown that studies of neutrino electromagnetic properties provide powerful tools to probe the physics beyond the Standard Model.

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[4] K. Kouzakov, A. Studenikin, "Theory of neutrino-atom collisions: the history, present status and BSM physics", Adv. High Energy Phys. 2014 (2014) 569409 (16 p.).

[5] I.. Balantsev, A. Studenikin, "From electromagnetic neutrinos to new electromagnetic radiation mechanism in neutrino fluxes", Int. J. Mod. Phys. A30 (2015) 1530044 (10 p) .

[6] A. Studenikin, Neutrino spin and spin-flavour oscillations in transversally moving or polarized matter, arXiv: 1610.06563.

New constraints on neutrino electromagnetic properties will be reviewed in the talk, including our new results on neutrino magnetic moment and millicharge, recently published:

[2] A. Studenikin, "New bounds on neutrino electric millicharge from limits on neutrino magnetic moment", Europhys. Lett. 107 (2014) 21001.

[3] A. Studenikin, I. Tokarev, "Millicharged neutrino with anomalous magnetic moment in rotating magnetized matter", Nucl. Phys. B 884 (2014) 396-407.

I would like to note that a new bound on neutrino millichage obtained in [2] has been included by «Particle Data Group Collaboration» in the list of the list of neutrino properties in «The Review of Particle Physics 2016» (C. Patrignani et al (Particle Data Group), Chinese Physics C 40, No. 10 (2016) 100001).

In my talk I shall also discuss a new effect of the neutrino spin oscillations engendered by interactions with the transversal currents of matter. This effect was proposed by myself several years ago, see details in:

[6] A. Studenikin, Neutrino spin and spin-flavour oscillations in transversally moving or polarized matter, arXiv: 1610.06563.

The existence of this effect and its importance in consideration of neutrino fluxes from supernovae has been shown in a series of papers:

[7] V. Cirigliano, G. Fuller, A. Vlasenko, Phys. Lett. B 747, 27 (2015);

[8] C. Volpe, Int. J. Mod.Phys. E 24, 1541009 (2015);

[9] A. Kartavtsev, G. Raffelt and H. Vogel, Phys. Rev. D 91, 125020 (2015);

[10] A. Dobrynina, A. Kartavtsev and G. Raffelt, Phys. Rev. D 93 (2016) no.12, 125030.

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Abstract Title:

Electromagnetic properties of neutrino

Subject:

Neutrinos

Parallel Session BSM+DM / 40

The SHiP experiment at CERN

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SHIP is a new general purpose fixed target facility, whose Technical Proposal has been recently reviewed by the CERN SPS Committee and by the CERN Research Board. The two boards recommended that the experiment proceeds further to a Comprehensive Design phase in the context of the new CERN Working group "Physics Beyond Colliders", aiming at presenting a CERN strategy for the European Strategy meeting of 2019. In its initial phase, the 400GeV proton beam extracted from the SPS will be dumped on a heavy target with the aim of integrating 2×10^20 pot in 5 years. A dedicated detector, based on a long vacuum tank followed by a spectrometer and particle identification detectors, will allow probing a variety of models with light long-lived exotic particles and masses below O(10) GeV /c2. The main focus will be the physics of the so-called Hidden Portals, i.e. search for Dark Photons, Light scalars and pseudo-scalars, and Heavy Neutrinos. The sensitivity to Heavy Neutrinos will allow for the first time to probe, in the mass range between the kaon and the charm meson mass, a coupling range for which Baryogenesis and active neutrino masses could also be explained. Another dedicated detector will allow the study of neutrino cross-sections and angular distributions. $\nu\tau$ deep inelastic scattering cross sections will be measured with a statistics 1000 times larger than currently available, with the extraction of the F4 and F5 structure functions, never measured so far and allow for new tests of lepton non-universality with sensitivity to BSM physics.

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The SHiP experiment at CERN

Subject:

BSM+DM

Parallel Session BSM+DM / 41

Experimental constraint on dark matter-Standard Model coupling with optical atomic clocks

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The total mass density of the Universe appears to be dominated by dark matter. However, beyond its gravitational interactions at the galactic scale, little is known about its nature. We have shown that a single optical atomic clock can be used as a detector for the hypothetical dark matter in the form of stable topological defects, for example, monopoles, strings or domain walls. We exploited differences in the susceptibilities to the fine-structure constant of essential parts of an optical atomic clock, i.e. the atoms and the cavity. We perform an experiment which constrained the strength of atomic coupling to hypothetical dark-matter cosmic objects. Under the conditions of our experiments, the degree of constraint was found to exceed the previously reported limits by more than three orders of magnitude.

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Experimental constraint on dark matter-Standard Model coupling with optical atomic clocks

Subject:

BSM+DM

Parallel Session QCD+HF / 43

CP Violation sensitivity at the Belle II Experiment

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The measurement of the time-dependent CP violation parameters for B-meson decays is crucial for tightening the constraints on the unitarity triangle and for the search of new physics beyond the Standard Model. A clean environment for the study of B decay channels is provided by B-factories. With a design luminosity of $8 \cdot 1035$ cm−2s−1, leading ultimately to an integrated luminosity beyond 50 ab−1, the new B-factory SuperKEKB will exceed the record instantaneous luminosity of its predecessor KEKB by a factor 40. The new Belle II detector will exploit the expected high statistics data sample thanks to a major upgrade of the tracking system, including a novel pixel vertex detector in its innermost part. Additionally, the detector capabilities will be complemented by substantial improvements in the reconstruction software. We develop a strategy for CP violation analysis in order to maximally exploit the new data set and to characterize the sensitivity of Belle II for various benchmark B decay channels.

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CP Violation sensitivity at the Belle II Experiment

Subject:

QCD+Flavour

Parallel Session Astro+Cosmo / 44

The Einstein@Home Gamma-ray Pulsar Survey

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Parallel Session Astro+Cosmo / 45

Results from ARIANNA

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Parallel Session BSM+DM / 46

The Zee model: connecting neutrino masses to Higgs lepton flavor violation

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I will discuss the Zee model, a radiative neutrino mass model with possible large lepton flavor violating Higgs (HLFV) decays, in particular $h \to \tau\mu$. In the first part I will analyse the effective operators responsible for HLFV and their tree level UV completions. By imposing constraints from charged lepton flavour violating observables, like $\tau \to \mu\gamma$, upper limits on BR($h \to \tau\mu$) can be set for the different realizations. In the second part of the talk, I will discuss the connection of HLFV to popular neutrino mass models. We will argue why most neutrino models generate very suppressed HLFV at one loop level. On the other hand, the general Zee model generates HLFV at tree level. We will present results of a full parameter scan which show how the model is fully testable by LHC and LFV searches.

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The Zee model: connecting neutrino masses to Higgs lepton flavor violation

Subject:

Neutrinos

Parallel Session Astro+Cosmo / **47**

Cosmological results from the Kilo Degree Survey

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Gravitational lensing represents a unique tool to study the dark Universe. In the weak lensing regime small distortions in the images of galaxies caused by the large-scale structure can be detected over the whole sky. Measuring these coherent distortions yields cosmological insights complementary to other probes like the cosmic microwave background (CMB). Ongoing wide-field imaging surveys exploit this to come up with competitive constraints on important cosmological parameters. In this talk I will concentrate on recent results from the ongoing European Kilo Degree Survey (KiDS) and show a mild tension of these results with CMB measurements from the Planck mission when the standard cosmological model is assumed. Possible solutions to this discrepancy using extensions to the standard model of cosmology and future developments will be discussed. I will conclude with an outlook towards missions like Euclid, LSST, and WFIRST.

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Cosmological results from the Kilo Degree Survey

Subject:

Astro/Cosmo

Parallel Session Astro+Cosmo / **48**

Results from H.E.S.S.

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Parallel Session Astro+Cosmo / **49**

Gravitational waves from the asymmetric dark matter generating phase transition

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Parallel Session Astro+Cosmo / 50

Results and prospects for BICEP3/Keck

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Parallel Session Astro+Cosmo / 51

Results and prospects from SPTpol and SPT-3G

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Cosmological results from the Kilo Degree Survey

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Parallel Session Astro+Cosmo / 53

The Pierre Auger Observatory: recent results and prospects

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Parallel Session BSM+DM / 54

Direct Dark Matter Search with CRESST III – Status & Perspectives

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Detecting Dark Matter (DM) particle is one of the most exciting experimental challenges of modern astroparticle physics. Many cosmological observations at different scales agree on the existence of DM ascribing 25% of the Universe's composition to it. In this context a variety of experiments have been performed in order to investigate the different possible DM candidates arising from theory. The CRESST III experiment, located at the Gran Sasso underground laboratory in Italy, is designed to detect Dark Matter interactions in $CaWO_4$ scintillating crystals, probing the low mass region of the

parameter space for spin-independent DM-nucleus scattering below $\sim$ 10 GeV/c^2 with a sensitivity never reached before.

In CRESST-III an array of 10 scintillating $CaWO_4$ crystals of $\sim$ 25 g each are read out simultaneously as cryogenic calorimeters and scintillating detectors. The scintillation light is measured with a second cryogenic calorimeter made of Silicon-On-Sapphire. Both cryogenic calorimeters of CRESST-III detectors are operated at temperatures below 10 mK and are equipped with Transition Edge Sensor (TES) thermometers for read-out.
The double channel read-out is foreseen for interacting particle identification used for background suppression. The TES sensors of the $CaWO_4$ crystals are designed to provide thresholds of the order of 50-100 eV.
Furthermore, the CRESST-III detectors modules are also equipped with a fully scintillating housing and instrumented holders to veto the possible background originated from surrounding surfaces.

Phase 1 of the CRESST-III experiment started data-taking in August 2016. In this contribution the current status and future perspectives of the CRESST-III experiment will be presented.

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Abstract Title:

Direct Dark Matter Search with CRESST III – Status & Perspectives

Subject:

BSM+DM

Parallel Session Astro+Cosmo / **55**

Cosmological results from H0liCOW

Parallel Session Astro+Cosmo / **56**

Cosmic Microwave Background Measurements with the South Pole Telescope

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The South Pole Telescope (SPT) is a millimeter-wavelength telescope surveying the cosmic microwave background (CMB). The SPT measures both the temperature and polarization of the CMB with a large aperture, resulting in high-resolution maps sensitive to signals across a wide range of angular scales on the sky. With these capabilities, the SPT has the potential to constrain inflationary gravitational waves as well as the effect of massive neutrinos on large-scale structure formation. I will present

recent highlights from the SPT surveys, including measurements of the polarized power spectra. Recently, the SPT was upgraded with a new receiver. I will briefly describe this receiver and discuss how it will open a new regime in multi-band polarized observations of the CMB.

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Cosmic Microwave Background Measurements with the South Pole Telescope

Subject:

Astro/Cosmo

Parallel Session BSM+DM / 57

Lepton Flavor Violation from Dim-6 and Dim-8 Operators at the LHC and Precision Measurements

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We compare the sensitivity of precision measurements of lepton flavour observables to the reach of the LHC in a case study of lepton-flavour violating operators of dimension six with two leptons and two quarks, and operators of dimension eight with two leptons and two gluons. For light quarks precision measurements always yield the more stringent constraints. The LHC complements precision measurements for operators with heavier quarks. Stronger limits can already be set on the cutoff scale for operators with τ leptons with the LHC.

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Lepton Flavor Violation from Dim-6 and Dim-8 Operators at the LHC and Precision Measurements

Subject:

BSM+DM

Parallel Session QCD+HF / 58

Belle II early physics program

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The Belle II experiment at the SuperKEKB collider is a major upgrade of the KEK "B factory" facility in Tsukuba, Japan aiming at an increase of the peak luminosity by a factor of 40. Commissioning of the SuperKEKB main ring took place in the first half of 2016. Phase 2 of the commissioning will start beginning of 2018 after the installation of the final focus system in the IR but still without the vertex detector system. Once machine operation in the nano-beam scheme is established the goal is to accumulate data for early physics analyses at different center-of-mass energies. In this talk we describe the physics program for this early data that will focus on bottomonium spectroscopy and low multiplicity studies like dark sector searches.

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Belle II early physics program

Subject:

QCD+Flavour

Parallel Session Astro+Cosmo / 59

ANTARES highlights and KM3NET/ARCA prospects

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Parallel Session Astro+Cosmo / 60

Astrophysical neutrinos at IceCube, a new window to the Cosmos

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Parallel Session Astro+Cosmo / 61

High-resolution SZ cartography of clusters of galaxies with the NIKA2 camera at the IRAM 30-m telescope

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Arcmin resolution thermal Sunyaev-Zeldovich (tSZ) observations (e.g. SPT, ACT and Planck) only allowed detailed studies of the intra cluster
medium morphology for low redshift clusters (z < 0.2).
The development of precision cosmology with clusters requires high-angular resolution observations to extend the understanding of galaxy clusters towards high redshift. NIKA2 is a wide-field (6.5 arcmin field of view) dual-band camera, operated at 100 mK and containing ~3000
KID (Kinetic Inductance Detectors), designed to observe the millimeter sky at 150 and 260 GHz, with an angular resolution of 18 and 12 arcsec respectively.
The NIKA2 camera has been installed on the IRAM 30-m telescope (Pico Veleta, Spain) in September 2015 and is currently being commissioned.
The NIKA2 tSZ observation program will allow us to observe a large sample of clusters (50) at redshifts between 0.5 and 1.
As a pathfinder for NIKA2, several clusters of galaxies have been observed at the IRAM 30-m telescope with the NIKA prototype to cover the various configurations and observation conditions expected for NIKA2.
I will present recent tSZ observations of clusters of galaxies with the NIKA prototype at the IRAM 30-m telescope together with the forthcoming tSZ observation program with the NIKA2 camera.

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Abstract Title:

High-resolution SZ cartography of clusters of galaxies with the NIKA2 camera at the IRAM 30-m telescope

Subject:

Astro/Cosmo

Parallel Session BSM+DM / 62

Search for new physics via baryon EDM at LHC

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Permanent electric dipole moments (EDMs) of fundamental particles provide powerful probes for physics beyond the Standard Model. We propose to search for the EDM of strange and charm baryons at LHC, extending the ongoing experimental program on the neutron, muon, atoms, molecules and light nuclei. The EDM of strange Λ baryons, selected from weak decays of charm baryons produced in pp collisions at LHC, can be determined by studying the spin precession in the magnetic field of the detector tracking system. A test of CPT symmetry can be performed by measuring the magnetic dipole moment of Λ and $\overline{\Lambda}$ baryons. For short-lived ^+_c and Ξ_c^+ baryons, to be produced in a fixed-target experiment using the 7 TeV LHC beam and channeled in a bent crystal, the spin precession is induced by the intense electromagnetic field between crystal atomic planes. The experimental layout based on the LHCb detector and the expected sensitivities in the coming years are discussed, along with perspectives for the future

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Abstract Title:

Search for new physics via baryon EDM at LHC

Subject:

QCD+Flavour

Parallel Session BSM+DM / 63

Dark Matter Results from First Data of the PandaX-II Experiment

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The Particle and astrophysical Xenon (PandaX) project is a series of xenon-based ultra-low background experiments in the China JinPing underground Laboratory (CJPL) targeting the unknown physics of dark matter and neutrinos. The first and second stage experiments (PandaX-I and II) both utilize dual-phase xenon time projection chamber (TPC) to carry out direct search for the dark matter particles. PandaX-II, a half-ton scale experiment, is currently under operation, and produced leading limits on dark matter-nucleon spin independent and spin dependent scattering cross sections in 2016. In this talk, I shall present an overview of the PandaX project and the results from the first data of the PandaX-II experiment.

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Abstract Title:

Dark Matter Results from First Data of the PandaX-II Experiment

Subject:

BSM+DM

Parallel Session Astro+Cosmo / 64

High-resolution SZ cartography of clusters of galaxies with the NIKA2 camera at the IRAM 30-m telescope

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Parallel Session Astro+Cosmo / 65

Neutrinos in Cosmology

Parallel Session Astro+Cosmo / 66

Exploring the cosmic middle age with MAGIC

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Parallel Session Astro+Cosmo / 67

tba

Parallel Session BSM+DM / 68

Warped Relaxion

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The relaxion proposal is a new alternative to justify the smallness of the Higgs mass. The idea is to explain the radiative stability of the Higgs sector through the cosmological relaxation mechanism of

the electroweak scale. Typically, in this framework, the effective Higgs mass is scanned by a scalar field (the relaxion) starting at some large value which slowly decreases during inflation. We propose a UV completion for the relaxion idea in the context of warped extra dimension scenarios. In our construction, the warp factor can naturally explain the large hierarchy between the decay constants in the relaxion potential.

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Abstract Title:

Warped Relaxion

Subject:

BSM+DM

Parallel Session BSM+DM / 69

Search for invisible decay of a dark photon produced in e+e- collisions at BABAR

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We report on a search for single-photon events in 53 fb−1 of e+e− collision data collected with the BABAR detector at the PEP-II B-factory. We look for events with a single high-energy photon and a large missing momentum and energy, consistent with production of a spin-1 particle A' through the process e+e- -> gamma A', A' -> invisible. Such particles, referred to as "dark photons", are motivated by theories applying a U(1) gauge symmetry to dark matter.
We find no evidence for such processes and set 90% confidence level upper limits on the coupling strength of A' to e+e- for a dark photon with a mass lower than 8 GeV. In particular, our limits exclude the values of the A' coupling suggested by the dark-photon interpretation of the muon (g-2) anomaly, as well as a broad range of parameters.

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Abstract Title:

Search for invisible decay of a dark photon produced in e+e- collisions at BABAR

Subject:

BSM+DM

Parallel Session BSM+DM / 70

Displaced vertices from pseudo-Dirac dark matter

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We generalize the pseudo-Dirac dark matter (pDDM) model, already considered in the literature in the context of effective field theories. In particular, we consider a simplified model in which a heavy Z'-vector boson couples the Standard Model sector to a Dirac fermion whose mass eigenstates are slightly separated in mass, with separation Δm. The lightest eigenstate (of mass m_1) is stable, and then represents a natural candidate for dark matter. The heaviest one, on the other hand, is unstable and can leave a trace at colliders in the form of jet(s)+missing energy. The effective cross section for coannihilations, which determines the relic abundance of DM, can be related to the predictions for collider signatures, and these can be used together to fix several free parameters of the model. As a result, for specific efficiency cuts and luminosity, we provide excluded regions in the $(m_1, \Delta m)$ plane, due to the lack of any signal at LHC.

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Abstract Title:

Pseudo-Dirac dark matter revisited

Subject:

BSM+DM

Parallel Session BSM+DM / 71

Dark matter search with the SABRE experiment

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The SABRE (Sodium Iodide with Active Background Rejection) experiment will search for an annually modulating signal from dark matter using an array of ultra-pure NaI(Tl) detectors surrounded by an active scintillator veto to further reduce the intrinsic background. The rate of interactions

between DM particles and the detector is expected to modulate due to Earth's changing velocity relative to the DM halo. The first phase of the experiment is the SABRE Proof of Principle (PoP), a single 5kg crystal detector operated in a liquid scintillator filled vessel at the Laboratori Nazionali del Gran Sasso (LNGS). The PoP installation is underway with the goal of running in 2017 and performing the first in situ measurement of the crystal background and testing the veto efficiency, thus validating the SABRE concept. GEANT4-based Monte Carlo simulations have been developed to estimate the background in the PoP. The most recent simulation is based on radio-purity measurements of the detector components and includes detailed versions of the detector part geometries. The second phase of SABRE will be twin arrays of NaI(Tl) detectors operating at LNGS and at the Stawell Underground Physics Laboratory (SUPL) in Australia. By locating detectors in both hemispheres, SABRE will minimize seasonal systematic effects. In this talk, the SABRE PoP activities at LNGS and results from the most recent Monte Carlo simulations will be presented.

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Abstract Title:

Dark matter search with the SABRE experiment

Subject:

BSM+DM

Parallel Session Neutrinos / **72**

Survey of neutrino-nucleus cross-section measurements from MINERvA

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Precision measurements of neutrino oscillation probabilities require an improved understanding of neutrino-nucleus interactions. MINERvA is a neutrino scattering experiment at Fermilab that utilizes the intense neutrino beam from the NuMI beam-line and a finely segmented scintillator based tracking detector to measure neutrino cross sections on various nuclear targets. MINERvA has published results using its low-energy data sets and is presently taking NOvA-era medium energy data. These results cover both exclusive and inclusive channels for muon and electron neutrino and anti-neutrino interactions. A summary of recent results from MINERvA will be presented.

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Abstract Title:

Survey of neutrino-nucleus cross-section measurements from MINERvA

Subject:

Neutrinos

Parallel Session BSM+DM / 74

Direct Dark Matter Detection with the XENON1T Experiment

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Dual-phase time-projection chambers based on noble gases are a very efficient particle detection technology which leads the field of dark matter searches. The XENON collaboration aims at a direct detection of dark matter with experiments based on liquid xenon.
The current step of the research program, the XENON1T experiment, is fully operational since May 2016 and is currently acquiring data. It features 2t of liquid xenon in the target, the ~10m water tank for background reduction via Cherenkov muon veto, and an innovative system for gas storage, liquefaction and purification.
In this talk I will discuss the technological aspects of the XENON1T detector, summarise the status and detector performance, and present the results from the first science run.

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Abstract Title:

Direct Dark Matter Detection with the XENON1T Experiment

Subject:

BSM+DM

Parallel Session BSM+DM / 75

Domain Walls in the Early Universe and Matter-Antimatter Domains

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We present a model of spontaneous (or dynamical) C and CP violation where it is possible to generate domains of matter and antimatter separated by cosmologically large distances. Such C(CP) violation existed only in the early universe and later it disappeared with the only trace of generated baryonic and/or antibaryonic domains. So the problem of domain walls in this model does not exist. These features are achieved through a postulated form of interaction between inflaton and a new scalar field, realizing short time C(CP) violation.

For the realization of this scenario the width of the domain wall should grow exponentially. Though there is a classical result found in paper by Basu and Vilenkin that the width of the wall tends to the one of the stationary solution. That is why we considered thick domain walls in a de Sitter universe following paper by Basu and Vilenkin. However, we are interested not only in stationary solutions found therein, but also investigated the general case of domain wall evolution with time. When the wall thickness parameter, δ_0, is smaller than $H^{-1}/\sqrt{2}$, where H is the Hubble parameter in de Sitter space-time, then the stationary solutions exist, and initial field configurations tend with time to the stationary ones. However, there are no stationary solutions for $\delta_0 \geq H^{-1}/\sqrt{2}$. We have calculated numerically the rate of the wall expansion in this case and have found that the width of the wall grows exponentially fast for $\delta_0 \gg H^{-1}$. An explanation for the critical value $\delta_{0c} = H^{-1}/\sqrt{2}$ is also proposed.

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Abstract Title:

Domain Walls in the Early Universe and Matter-Antimatter Domains

Subject:

Astro/Cosmo

Dark Matter / **77**

Axion Dark Matter Search Experiments

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The nature of dark matter is one of the great mysteries of modern physics and may be the result of new particles beyond the standard model. The Axion, originally conceived as a solution to the strong-CP problem in nuclear physics, is one well-motivated candidate. In 1983 Pierre Sikivie proposed an experimental search technique, known as an axion haloscope, that relies on a large microwave cavity immersed in a strong static magnetic field to resonantly convert dark matter axions to detectable photons. This became the foundation of the Axion Dark Matter eXperiment (ADMX), which has recently began taking data at unprecedented sensitivity in the classical QCD-axion mass range of several μeV. In addition, several new detection techniques have been proposed to cover a large span

of potential axion masses beyond that of the classical window. In this talk I will describe the history of axion dark matter searches and give a survey of the R&D efforts currently underway to explore the entire axion dark matter mass window.

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Axion Dark Matter Search Experiments

Subject:

BSM+DM

Parallel Session BSM+DM / 78

Low-mass WIMP search with the EDELWEISS experiment

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EDELWEISS is an experiment dedicated to direct dark matter searches using high-purity germanium detectors equipped with a full charge and thermal signal readout. The detectors are operated at 18 mK in the underground laboratory of Modane, in the Frejus tunnel. Recent results on the spin-independent WIMP-nucleon cross-section for WIMP masses below 30 GeV for a fiducial exposure of 582kg.day will be shown. In addition, we present a measurement of the cosmogenic activation of tritium in germanium detectors, an important background to consider in searches for low-mass WIMPs. Technical developments to explore the region from 1 to 20 GeV will be presented as well.

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Abstract Title:

Low-mass WIMP search with the EDELWEISS experiment

Subject:

BSM+DM

Parallel Session Neutrinos / 79

Results of the Daya Bay experiment

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Parallel Session Neutrinos / 80

Sterile neutrino

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Parallel Session Neutrinos / 81

Results of NOvA

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Parallel Session Neutrinos / 82

KM3NeT/ORCA and the neutrino mass ordering

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Parallel Session Neutrinos / 83

CP-Violation and Non-Standard Interactions at the MOMENT

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To measure the last unknown 3ν oscillation parameter (δ), several long baseline neutrino experiments have been designed or proposed. Recently it has been shown that turning on neutral current Non-Standard Interactions (NSI) of neutrinos with matter can induce degeneracies that may even hinder the proposed state-of-the-art DUNE long baseline experiment from measuring the value of δ. After a brief review of models that can give rise to sizeable NSI, we show how the result of the proposed MOMENT experiment with a baseline of 150 km and 200 MeV<Eν<600 MeV can help to solve the degeneracy induced by NSI and determine the true value of δ.

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Subject:

Parallel Session Neutrinos / **84**

Results of Cuore

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85

Hightlight of Charm meson Physics at BESIII

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Recently, BESIII have some studies about Charm meson Physics, such as Leptonic, Semileptonic and hadronic decays.
In the HF&QCD parallel session, I will introduce these results.

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Hightlight of Charm meson Physics at BESIII

Subject:

QCD+Flavour

Parallel Session Higgs+Top+EW / **86**

Inclusive and differential W/Z measurements in ATLAS and CMS

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Parallel Session Higgs+Top+EW / 87

Measurement of W-boson mass in ATLAS

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Subject:

Parallel Session Higgs+Top+EW / 88

Factorisation of the Drell-Yan qT spectrum with massive quarks

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Subject:

Parallel Session Higgs+Top+EW / 89

Electroweak boson production with jets in CMS

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The production of electroweak bosons (W, Z or gamma) in association with jets is a stringent test of perturbative QCD and is a background process in searches for new physics. Total and

differential cross-section measurements of electroweak bosons produced in association with jets (and heavy flavour quarks) in proton-proton collisions are presented. The data have been recorded with the CMS detector at the LHC and are compared to the predictions of event generators and theoretical calculations.

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Subject:

Parallel Session Higgs+Top+EW / 90

Multiboson production in ATLAS and CMS

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Parallel Session Higgs+Top+EW / 91

Measurements of diboson production at 13 TeV in ATLAS

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Subject:

Parallel Session Higgs+Top+EW / 92

Automatised computations of electroweak corrections

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Subject:

Parallel Session Higgs+Top+EW / 93

VBF and VBS production in SM processes in ATLAS and CMS

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Subject:

Parallel Session Astro+Cosmo / 94

Highlight results from H.E.S.S.

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H.E.S.S. (High Energy Stereoscopic System) is a hybrid array of Imaging Atmospheric Cherenkov Telescopes observing the very high energy gamma-ray sky. In the past decade, this experiment has significantly contributed to the field of ground-based gamma-ray astronomy. In particular, the H.E.S.S. Galactic plane survey (HGPS), conducted from 2004 to 2013, was the first high-resolution (~0.1 deg) and sensitive (~1.5% Crab Nebula point-source sensitivity) survey of the Milky Way in TeV gamma-rays. Comprising ~2800-hrs of observation time, it revealed the existence of a diverse population of cosmic accelerators in the Galaxy.
In 2012, a fifth telescope was added at the center of the original array. This new phase of the experiment - H.E.S.S. II - provides the first hybrid array of Cherenkov telescopes and allows to lower the energy threshold from 100 to ~ 20 GeV, bridging the gap with Fermi-LAT and preparing the path for

CTA.
In this talk, selected highlights from recent results obtained with H.E.S.S. will be presented.

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Highlight results from H.E.S.S.

Subject:

Astro/Cosmo

Parallel Session Astro+Cosmo / 95

The Very-High-Energy Gamma-ray Sky: Recent Results from VERITAS

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Parallel Session Higgs+Top+EW / 96

Top mass measurements in ATLAS and CMS

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Parallel Session Higgs+Top+EW / 97

Measurements of top quark properties in ATLAS and CMS

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Parallel Session Higgs+Top+EW / 98

Pair production of top quarks in ATLAS and CMS

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Parallel Session Higgs+Top+EW / 99

Differential ttbar cross section measurements in ATLAS

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Parallel Session Higgs+Top+EW / 100

Study of top production in complementary phase space regions and impact on PDFs in CMS

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Parallel Session Higgs+Top+EW / 101

Single top production in ATLAS and CMS

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Parallel Session Higgs+Top+EW / 102

Search for deviations from SM in top precision measurements in CMS

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Parallel Session Higgs+Top+EW / 103

2HDM effects in top-quark pair production

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Parallel Session Higgs+Top+EW / 104

ttH/tH/tWH production

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Parallel Session Higgs+Top+EW / 105

Measurement of Higgs boson cross sections and couplings in ATLAS

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Parallel Session Higgs+Top+EW / 106

Perspectives on the Higgs p_T as a probe BSM physics

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Parallel Session Higgs+Top+EW / 107

Searches for h(125) BSM properties in CMS

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Parallel Session Higgs+Top+EW / 108

Searches for BSM Higgs bosons in ATLAS

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Parallel Session Higgs+Top+EW / 109

Searches for BSM Higgs bosons in CMS

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Subject:

Parallel Session Higgs+Top+EW / 110

VBF production of Higgs boson pairs

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Parallel Session Higgs+Top+EW / 111

Measurement of the Higgs properties in bosonic decay channels at 13 TeV in ATLAS

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Parallel Session BSM+DM / 114

Searches for dark matter and new physics in ATLAS and CMS

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Parallel Session BSM+DM / 115

Searches with boosted objects in ATLAS and CMS

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Parallel Session BSM+DM / 116

Searches for supersymmetry in ATLAS

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Parallel Session BSM+DM / 117

Searches for electroweak SUSY production at CMS

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Parallel Session BSM+DM / 118

Searches for s-channel production of new resonances in ATLAS

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Parallel Session BSM+DM / 119

Searches for new heavy resonances in final states with dileptons, diphotons and dijets in CMS

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Parallel Session BSM+DM / 120

Directional detection of Dark Matter with a nuclear emulsion based detector

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Direct dark matter searches are promising techniques to identify the nature of dark matter particles. A variety of experiments have been developed over the past decades, aiming at detecting Weakly Interactive Massive Particles (WIMPs) via their scattering in a detector medium. Exploiting directionality would give a proof of the galactic origin of dark matter making it possible to provide a clear and unambiguous signal to background separation. In particular, the directionality appears as the only way to overcome the neutrino background that is expected to finally prevent standard techniques to further lower cross-section limits. The directional detection of Dark Matter requires very sensitive experiment combined with highly performing technology. The NEWSdm experiment, based on nuclear emulsions, is proposed to measure the direction of WIMP-induced nuclear recoils and it is expected to produce a prototype in 2017. We discuss the discovery potential of a directional experiment based on the use of a solid target made by newly developed nuclear emulsions and read-out systems reaching sub-micrometric resolution.

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Parallel Session BSM+DM / 121

Effects of QCD bound states on DM relic abundance

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Parallel Session BSM+DM / 122

Composite dark matter

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Parallel Session BSM+DM / 123

Dark Matter and Enlarged Higgs Sectors Extended with Vector Like Leptons

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Parallel Session QCD+HF / 124

Heavy flavour production and properties in ATLAS and CMS

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Parallel Session QCD+HF / 125

Status of mixing and CP-violation measurements at LHCb

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Parallel Session QCD+HF / 126

CP Violation sensitivity at the Belle II Experiment

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Parallel Session QCD+HF / 127

Hightlight of Charm meson Physics at BESIII

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Parallel Session QCD+HF / 128

New physics searches via rare decays at LHCb

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Parallel Session QCD+HF / 129

Recent Heavy Flavour results from Tevatron

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Belle II early physics program

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QCD with jets and photons in CMS and ATLAS

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Soft QCD in CMS and Atlas

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Higgs-differential cross sections

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Top-bottom interference effects in Higgs plus jet production at the LHC

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Nucleon Form Factors at BESIII

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Nucleon Form Factors at BESIII

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Enhanced strangeness production in high-multiplicity proton-proton collisions in ALICE

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Measurement of hadronic cross sections for the calculation of the muon g-2 with BaBar

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Heavy flavour production and spectroscopy at LHCb

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Recent results with heavy ion and fixed target collisions at LHCb

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Recent B -> D* tau nu study at Belle

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Searches for LFU breaking using semileptonic B decays at LHCb

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Discussion on Higgs boson

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Discussion on flavour physics anomalies

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Discussion on neutrinos

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