

Workshop RENAFAE 2018



Report of Contributions

Contribution ID: 2

Type: **not specified**

Status of the contribution of CBPF to the new Tracker of LHCb experiment

After many years of R&D the new Tracker of the LHCb experiment, one of the main components of its upgrade, based on thin scintillators fibers coupled to SiPM, named SciFi project, has recently started in production phase. I will review the SciFi project, concentrating on the description of the new Front-end electronics and the test suite mass-production results, the main CBPF contribution.

Primary authors: Dr MASSAFFERRI, André (CBPF); Prof. CARNEIRO, Ulisses (CEFET-RJ)

Presenters: Dr MASSAFFERRI, André (CBPF); Dr BEHALF OF CBPF/LHCB GROUP (CBPF)

Session Classification: Instrumentação

Track Classification: Instrumentação

Contribution ID: 3

Type: **not specified**

Atividades Gaúchas de divulgação da Ciência

Monday, July 30, 2018 9:00 AM (15 minutes)

De forma a divulgar e popularizar a Física de Partículas e as investigações levadas a cabo no Grande Colisor de Hádrons do CERN, os grupos experimentais do CMS e do ALICE do Instituto de Física da Universidade Federal do Rio Grande do Sul (UFRGS) se uniram para promover um projeto piloto de divulgação junto a estudantes de Ensino Médio de escolas do Rio Grande do Sul. Este projeto visa promover atividades em escolas de Ensino Médio de cunho informativa, bem como experimentos que revelem a natureza das partículas elementares. Atividades desta natureza se propõem a motivar a participação de estudantes na Masterclass a ocorrer na UFRGS em 2019, tendo como público-alvo estudantes do terceiro ano do Ensino Médio com o objetivo de ser uma atividade de incentivo ao ingresso na carreira científica.

Primary authors: Prof. DA SILVEIRA, Gustavo Gil (Universidade do Estado do Rio de Janeiro (BR)); Ms MOSSI HAIDUK, Fernanda (Universidade Federal do Rio Grande do Sul)

Co-author: Dr PEZZI, Rafael (Univ. Federal do Rio Grande do Sul (BR))

Presenter: Prof. DA SILVEIRA, Gustavo Gil (Universidade do Estado do Rio de Janeiro (BR))

Session Classification: Divulgação Científica

Track Classification: Divulgação Científica

Contribution ID: 4

Type: **not specified**

The Giant Radio Array for Neutrino Detection (GRAND)

Tuesday, July 31, 2018 10:15 AM (15 minutes)

Ultra-high-energy extraterrestrial neutrinos can be used to study energetic processes taking place in the vicinity of astrophysical objects and in the intergalactic medium. They are useful to search for signs of Beyond the Standard Model physics, since energies of $E > 10^{17}$ eV cannot be attained by current particle accelerators.

The Giant Radio Array for Neutrino Detection (GRAND) will detect extensive air showers induced by the decay of tau leptons due to the interaction of high-energy neutrinos with the surface of the Earth. It consists of an array of antennas covering an area of 200000 km². The projected integrated 10-year all-flavour sensitivity is $\sim 4 \times 10^{-11}$ GeV cm⁻² s⁻¹ above 4×10^{17} eV, with sub-degree angular resolution. The detection of cosmogenic neutrinos with GRAND is guaranteed. Moreover, sources of neutrinos produced in ultra-high-energy cosmic-ray accelerators are also expected to be detected. In this talk I will present the preliminary design and the physics capabilities of the experiment, as well as the status of the ongoing efforts.

Primary author: ALVES BATISTA, Rafael (University of São Paulo)

Presenter: ALVES BATISTA, Rafael (University of São Paulo)

Session Classification: Instrumentação

Track Classification: Instrumentação

Contribution ID: 5

Type: **not specified**

Status of the JUNO observatory and Brazilian contribution

Tuesday, July 31, 2018 11:00 AM (15 minutes)

The Jiangmen Underground Neutrino Observatory (JUNO) is a 20 kiloton liquid scintillator detector to be placed 700-meter deep underground at 52.5Km from 10 nuclear reactors delivering at present 26.6TW of thermal power. The detector, designed for an unprecedented 3% energy resolution at 1MeV, has a rich physics potential including the determination of the neutrino mass hierarchy, improvement of precision of oscillation parameters, observation of supernovae and geo-neutrinos and so on. Control of the systematics of the energy response is crucial to archive the designed energy resolution as well as to reach 1% precision of the absolute energy scale. For this reason there are ~18,000 20-inch photo-multiplier tubes (PMTs) in the central detector with an optical coverage greater than 75%. MA Small-PMT system of 3-inch PMT has been approved to provide a unique way to calibrate the energy response. After an overview of the observatory, the physics concept of double calorimetry will be discussed. Finally the contribution of Brazilian institutions to this international effort will be described.

Primary author: CHIMENTI, Pietro

Presenter: CHIMENTI, Pietro

Session Classification: Instrumentação

Track Classification: Instrumentação

Contribution ID: 6

Type: **not specified**

Santos Dumont: uma infraestrutura computacional à serviço do desenvolvimento científico e tecnológico

Monday, July 30, 2018 3:15 PM (45 minutes)

Presenter: Prof. VIEIRA LÉO, Wagner

Contribution ID: 7

Type: **not specified**

Sirius: Desafio da instrumentação científica no Brasil

Monday, July 30, 2018 2:30 PM (45 minutes)

Presenter: Prof. ROQUE DA SILVA, José

Contribution ID: 8

Type: **not specified**

Paralela

Contribution ID: 9

Type: **not specified**

Paralela

Contribution ID: **10**

Type: **not specified**

Abertura do Workshop

Monday, July 30, 2018 2:00 PM (30 minutes)

Presenters: DE BEDIAGA HICKMAN, Ignacio (Centro Brasileiro de Pesquisas Físicas (CBPF)); GAMEIRO MUNHOZ, Marcelo (Universidade de Sao Paulo (BR)); Prof. MARTINS, Marcos (Instituto de Física da USP)

Contribution ID: 11

Type: **not specified**

Status do experimento de raios cósmicos CREAT na Antártica

Monday, July 30, 2018 9:00 AM (15 minutes)

Vou apresentar o status do projeto CREAT (Cosmic Ray Experiment at Antarctic) dedicado a estudar possíveis correlações entre a incidência de raios cósmicos e formação de nuvens. Este projeto, dividida em 3 fases, tem uma versão piloto tomando dados de fluxo de raios cósmicos desde 2014 na estação Criosfera 1 na latitude 84, a 640km do Polo Sul. A segunda fase deve ser instalada este ano e consiste no upgrade da versão piloto. A terceira fase consistirá na instalação de um telescópio de muons, com medidas de fluxo, distribuição e energia, representando a componente de mais alta energia, e de um detector de neutrons, cobrindo o espectro de baixa energia.

Primary authors: Dr MASSAFFERRI RODRIGUES, André (CBPF); Mr GUEDES, Leonardo (CBPF); Mr KOEBCKER, Marcos (CBPF); Prof. EVANGELISTA, Heitor (UERJ); Mr PASSOS, Heber (INPE); Mr CARNEIRO, Ulisses (CEFET); Mr MACEDO, Rafael (CBPF)

Presenter: Dr MASSAFFERRI RODRIGUES, André (CBPF)

Session Classification: Instrumentação

Track Classification: Instrumentação

Contribution ID: 12

Type: **not specified**

programa Beam-Line-4-Schools no Brasil

Tuesday, July 31, 2018 11:30 AM (15 minutes)

Beam-Line-for-Schools consiste em programa anual de divulgação científica do CERN no qual equipes formadas por estudantes de nível-médio são estimuladas a submeter propostas criativas para a realização de medidas utilizando o feixe PS e de um conjunto de detectores do CERN. As 2 melhores propostas do mundo são premiadas com a execução das propostas por 2 semanas. Motivado por essa iniciativa desde 2016 alguns grupos brasileiros vem submetendo propostas. Vou apresentar a experiência que tivemos no CBPF e uma proposta de sincronizar os esforços no sentido de agregar mais pessoas e estimular a cultura da instrumentação em física de altas energias.

Primary author: Dr MASSAFFERRI RODRIGUES, André (CBPF)

Presenter: Dr MASSAFFERRI RODRIGUES, André (CBPF)

Session Classification: Divulgação Científica

Track Classification: Divulgação Científica

Contribution ID: 13

Type: **not specified**

Status of The Coherent Neutrino Nucleus Interaction Experiment (CONNIE)

Tuesday, July 31, 2018 12:00 PM (15 minutes)

Coherent elastic neutrino-nucleus scattering (CEnNS) is an interaction process that was predicted by the Standard Model but only recently was observed. Although its cross-section is coherently enhanced at low neutrino energies, the resulting keV-range nuclear recoil energies are below the thresholds of most detectors. The detection of coherent scattering with different experimental techniques is of significant interest, since it can act as a probe for physics beyond the Standard Model and may also be useful to monitor nuclear power plants. The measurement of CEnNS will increase our knowledge on a limiting background for future dark matter searches and is useful in understanding the supernovae processes.

The Coherent Neutrino-Nucleus Interaction Experiment (CONNIE) uses fully depleted high-resistivity CCDs (charge coupled devices) as particle detectors with the goal of measuring for the first time CEnNS of reactor antineutrinos with silicon nuclei. The CONNIE detector has been operating since 2014 at a distance of 30 m from the core of the Angra II 3.8 GW nuclear reactor in Angra dos Reis, RJ, Brazil. The detector has demonstrated stable operation, low noise of less than 2e- RMS, and low background contamination levels achieved using passive shielding. In 2016 the experiment was upgraded, increasing its active mass from 4 g of silicon to 80 g, and implementing a number of improvements on the control and operations. We will report on the performance of the CONNIE detector, preliminary results from the current data, and future perspectives for detecting CEnNS.

Primary author: NASTEVA, Irina (Federal University of Rio de Janeiro (BR))

Co-authors: BONIFAZI, Carla (IF-UFRJ); MAKLER, Martin (CBPF); PESSOA LIMA JUNIOR, Herman (Instituto de Fisica); MOTA, Philipe (Goethe Universität Frankfurt)

Presenter: NASTEVA, Irina (Federal University of Rio de Janeiro (BR))

Session Classification: Análise de Dados

Track Classification: Análise de Dados

Contribution ID: 15

Type: **not specified**

Status of the contribution of CBPF to the new Tracker of LHCb experiment

Monday, July 30, 2018 10:00 AM (15 minutes)

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Primary authors: MASSAFFERRI RODRIGUES, Andre (CBPF - Brazilian Center for Physics Research (BR)); Mr AYRES ROCHA, Diogo (CBPF - Brazilian Center for Physics Research (BR)); DE FREITAS CARNEIRO DA GRACA, Ulisses (CBPF - Brazilian Center for Physics Research (BR))

Presenter: Mr AYRES ROCHA, Diogo (CBPF - Brazilian Center for Physics Research (BR))

Session Classification: Instrumentação

Track Classification: Instrumentação

Contribution ID: 16

Type: **not specified**

Brazilian participation in the Middle and Large Size Telescopes of the Cherenkov Telescope Array

Tuesday, July 31, 2018 11:15 AM (15 minutes)

In this talk we will present the development of instrumentation and analysis methods developed by several scientists in Brazil in connection with the Middle and Large Size telescopes of the CTA Observatory.

Primary authors: DE SOUZA, vitor (ifsc-usp); BARRES, Ulisses (Centro Brasileiro de Pesquisas Físicas)

Presenter: DE SOUZA, vitor (ifsc-usp)

Session Classification: Instrumentação

Track Classification: Instrumentação

Contribution ID: 17

Type: **not specified**

Brazilian Participation on the Resistive Plate Chambers (RPC) upgrade project of the CMS muon system

Monday, July 30, 2018 9:15 AM (15 minutes)

The Resistive Plate Chambers (RPC) are used in the barrel and forward region of the CMS muon system. They provide a muon trigger and are used in the muon trajectory reconstruction.

The future increase of the LHC luminosity (HL-LHC) imposes a challenge to the RPC system. In order to cope with the new conditions, an upgrade is planned. In the forward region, two additional RPC stations called RE3/1 and RE4/1, based on improved RPC technology will be installed. The link boards of the present RPC detectors will be upgraded allowing better time resolution and higher rate capabilities.

During the last years, several studies on the performance of new technologies and configurations have been done using Monte-Carlo simulations and testing new detectors in the Gamma Irradiation Facility at CERN. The results indicate that the technology to be used for the extension of the RPC system is HPL double gap RPC.

This talk will present the main activities are developing by Brazilian groups, in the special of the UERJ and UNICAMP, on RPC upgrade project Phase I and our proposal the contribution for the RPC Upgrade Phase II program will be finished with the installation of the chambers during the Yearly Technical Stops at the end of 2022 and 2023.

Primary author: FONSECA DE SOUZA, Sandro (Universidade do Estado do Rio de Janeiro (BR))

Presenter: FONSECA DE SOUZA, Sandro (Universidade do Estado do Rio de Janeiro (BR))

Session Classification: Instrumentação

Track Classification: Instrumentação