2019 Joint Workshop on Future charm-tau Factory

Report of Contributions

https://rich2018.org/indico/e/2019ctau

Contribution ID : 1 Type : Talk

Dark photons in particle collisions

Tuesday, 24 September 2019 10:10 (20)

New physics may show itself in vector portal via the kinetic mixing of the ordinary photon with the dark one. For very light dark photon its production in particle collisions occur via oscillations with the ordinary photon. We discuss probability of light dark photon production and its possible signatures at collider experiments.

Primary author(s) : DEMIDOV, Sergey (INR RAS)

Presenter(s) : DEMIDOV, Sergey (INR RAS)

Session Classification : Physics Day

Track Classification : Physics

Contribution ID : 3 Type : Talk

Measurement of Michel parameters in tau decays at the Super Charm-Tau factory with polarized electron beam

Tuesday, 24 September 2019 14:20 (25)

Michel parameters (MP) determine the Lorentz structure of the charged weak interaction, they are in the list of the basic properties of every lepton. The difference of the measured MP from their Standard Model expectation will exhibit clear signature of the New Physics. Feasibility study of Michel parameters at the Super Charm-Tau factory and Belle II with polarized electron beam has been carried out. This simple generator level study allows us to estimate the statistical sensitivities to MP as a function of electron beam polarization. Two analysis techniques were tested: the unbinned maximum likelihood fit of the (tau --> lep nu nu; tau --> pi pi0 nu) events in the full nine-dimensional phase space, and unbinned maximum likelihood fit of the (tau --> lep nu nu; tau --> all) in the three-dimensional phase space. Sensitivities to MP were estimated for the whole expected Super Charm-Tau factory and Belle II tau data samples. The impact of the electron beam polarization at the Super Charm-Tau factory is discussed.

Primary author(s) : EPIFANOV, Denis (BINP)

Presenter(s) : EPIFANOV, Denis (BINP)

Session Classification : Physics Day

Track Classification : Physics

Contribution ID : 4 Type : Talk

Search for CPV in tau-> K pi nu at e+ e- colliders, effect of the polarized electron beam

Tuesday, 24 September 2019 15:15 (25)

Recent results of high-statistics studies of the tau -> K pi nu decays at e+ e- B factories, Belle and BABAR, are reviewed. Complementary searches for CP symmetry violation in the tau -> K_S pi (>= 0 pi0) nu decays at BABAR and tau -> K_S pi nu at Belle are discussed. The new technique to search for CPV in tau -> K_S pi nu decay is proposed where the CPV phase is extracted in the unbinned maximum likelihood fit of the (tau -> K_S pi nu; tau -> pi pi0 nu) events in the 12-dimensional phase space. The impact of the electron beam polarization at the Super Charm-Tau factory is analyzed.

Primary author(s) : EPIFANOV, Denis (BINP)

Presenter(s) : EPIFANOV, Denis (BINP)

Session Classification : Physics Day

Track Classification : Physics

Contribution ID : 5 Type : Talk

Status of the R&D on the calorimeter based on pure CsI crystals for the Super Charm-Tau factory

Wednesday, 25 September 2019 14:30 (20)

Modern high luminosity e+ e- factory requires fast electromagnetic calorimeter to collect the data efficiently at high trigger rates and suppress severe beam background. The prototype of the calorimeter for the Super Charm-Tau factory based on pure CsI scintillation crystals, wavelength shifters with the novel nanostructured organosilicon luminophores, and avalanche photodiodes Hamamatsu S8664-55 is discussed. The results of the beam test of the basic element of the calorimeter are reported. Simulation of the calorimeter response is also briefly discussed.

Primary author(s) : Mr ORESHKIN, Sergey (BINP)

Presenter(s) : Mr ORESHKIN, Sergey (BINP)

Session Classification : Detector Day

Track Classification : Detectors

Contribution ID : 6 Type : Talk

Readout electronics for PID systems based on Large Area Picosecond Photodetectors

Wednesday, 25 September 2019 18:40 (20)

Large Area Picosecond Photodetectors (LAPPD) are a new generation of microchannel plate based photomultipliers being manufactured by Incom. These devices feature large sensitive area of 350 cm^2, high quantum efficiency (∼20%), and tens of picosecond single photon level timing resolution. Initial devices use a stripline anode structure, allowing for high spatial resolution of 1-3 mm while minimizing the number of readout channels. These characteristics make LAPPD a very attractive option as a photodetector for collider experiments in High Energy Physics, such as future Charm-Tau Factories. In this report we present readout electronics which has been developed to be used with LAPPD devices. This electronics read out all channels of a single stripline-anode LAPPD. Waveform sampling up to 5GSPS is performed with the DRS4 switched-capacitor array ASIC. All DRS4 channels are digitized in parallel with two 32-channel ADCs. An on-board FPGA coordinates digitization and readout of waveforms, and could further be expanded to include some waveform processing. Data packages built in the FPGA are sent to a DAQ system via optical fiber, with a baseline Gigabit Ethernet interface implemented entirely on the FPGA. The electronics has different triggering options: self-triggering using DRS4 transparent mode and external triggering, making event control very flexible. Further flexibility is enhanced with embedded software for an on-FPGA soft-core processor, as well as DAQ readout and control software. This open-source ecosystem is being developed to provide full control of the device operation and an easy way to integrate it to any environment. In the report we describe the status of the electronics development along with its firmware and readout software.

Primary author(s) : Dr CROKER, Kevin (University of Hawaii at Manoa); Prof. NISHIMURA, Kurtis (University of Hawaii at Manoa); SHEBALIN, Vasily (University of Hawaii); Dr JOCHER†, Glenn (Ultralytics LLC)

Presenter(s) : SHEBALIN, Vasily (University of Hawaii)

Session Classification : Detector Day

Track Classification : Detectors

Contribution ID : 7 Type : Talk

ARICH system operation and performance in Belle2 experiment

Wednesday, 25 September 2019 12:25 (20)

We developed Aerogel RICH (ARICH) detector as a forward endcap PID detector in the Belle II spectrometer. ARICH consists of 248 aerogel tiles as radiators and 420 Hybrid Avalanche Photodetectors (HAPDs) as photon detectors. Belle II conducted the commissioning operation in 2018, and then started the physics run this year. In this presentation, the operation and experience as well as the initial performance of the ARICH detector is reported.

Primary author(s) : NISHIDA, Shohei (KEK)

Presenter(s) : NISHIDA, Shohei (KEK)

Session Classification : Detector Day

Track Classification : Detectors

Contribution ID : 8 Type : Talk

Measurement of the cross section $e^+e^- \to n\bar{n}$ near threshold at Super Charm-Tau Factory

Tuesday, 24 September 2019 10:30 (20)

We presented new technique of the measurement cross section at e^+e^- collider. This approach base on study angular distribution in laboratory frame as function of energy near threshold, when center mass system has non-zero velocity. Such technique can be used at Super Charm-Tau Factory. Super Charm-Tau Factory has Crab Waist collision scheme of the interaction point. It gives the velocity of the center mass system $\sim 0.03c$. We complied feasibility study of this technique for the $e^+e^- \to n\bar{n}$ process. In case standard way, main contribution in invariant mass resolution is beam energy spread. Our study allows one obtain invariant mass resolution from beam energy spread much smaller then gives widely used approach. On the threshold, relative resolution depend on $\delta E_b/E_b \sim 10^{-3}$ for widely used approach. For new one technique relative invariant mass resolution depend as $(\delta E_b/E_b)^2 \sim 10^{-6}$. We assume that contributions from other factors are large. New technique allows one reach invariant mass resolution $\delta W/W \sim 10^{-4}$. This gives possibility study fine structure of the cross section near threshold.

Primary author(s) : Mr BOBROV, Alexander (BINP, NSU); Prof. BONDAR, Alexander (BINP, NSU)

Presenter(s) : Mr BOBROV, Alexander (BINP, NSU)

Session Classification : Physics Day

Track Classification : Physics

Contribution ID : 9 Type : Talk

The BabaYaga Event Generator for future e+e– colliders

Tuesday, 24 September 2019 16:00 (20)

Presenter(s) : CARLONI CALAME, Carlo Michel (Istituto Nazionale di Fisica Nazionale, Sezione di Pavia, Italy)

Session Classification : Physics Day

Contribution ID : 10 Type : Talk

Status of the Hefei STC project

Tuesday, 24 September 2019 09:30 (20)

Presenter(s) : PENG, Haiping (USTC)

Session Classification : Physics Day

Contribution ID : 11 Type : Talk

Status of the BINP SCT project

Tuesday, 24 September 2019 09:50 (20)

Presenter(s) : LOGASHENKO, Ivan (BINP/NSU)

Session Classification : Physics Day

Contribution ID : 14 Type : Talk

Hyperon physics at SCT with polarized beams

Tuesday, 24 September 2019 11:10 (20)

Presenter(s) : KUPSC, Andrzej (Uppsala University)

Session Classification : Physics Day

Contribution ID : 15 Type : Talk

CPV in hyperon and charmed baryon decays

Tuesday, 24 September 2019 11:30 (20)

Presenter(s) : LI, Hai-Bo (Institute of High Energy Physics)

Session Classification : Physics Day

Contribution ID : 17 Type : Talk

CPV in tau decays with polarization

Tuesday, 24 September 2019 14:45 (30)

Presenter(s) : PASSEMAR, Emilie (Indiana University/JLab)

Session Classification : Physics Day

Contribution ID : 18 Type : Talk

Progress in simulation of SCT calorimeter

Tuesday, 24 September 2019 16:55 (15)

Presenter(s) : BULYZHENKOV, Ivan

Session Classification : Physics Day

Contribution ID : 19 Type : Talk

MC for bremsstrahlung in decays

Tuesday, 24 September 2019 16:20 (20)

Presenter(s) : ANTROPOV, Sergii (Institute of Nuclear Physics Polish Academy of Sciences)

Session Classification : Physics Day

Contribution ID : 20 Type : Talk

Physics backgrounds simulation

Tuesday, 24 September 2019 16:40 (15)

Presenter(s) : SHEKHTMAN, Lev

Session Classification : Physics Day

Contribution ID : 21 Type : Talk

Software for SCT detector: status

Tuesday, 24 September 2019 17:10 (15)

Presenter(s) : SUKHAREV, Andrey (Budker INP)

Session Classification : Physics Day

Contribution ID : 22 Type : Talk

Software for STC detector: status

Tuesday, 24 September 2019 17:25 (20)

Presenter(s) : HUANG, Xingtao

Session Classification : Physics Day

Contribution ID : 23 Type : Talk

Turnkey software for future collider experiments

Tuesday, 24 September 2019 17:45 (20)

Presenter(s) : SAILER, Andre (CERN)

Session Classification : Physics Day

Contribution ID : 24 Type : Talk

Inner tracker options for SCTF: status and perspectives

Wednesday, 25 September 2019 09:30 (20)

Presenter(s) : SOKOLOV, Andrey (Budker INP)

Session Classification : Detector Day

Contribution ID : 25 Type : Talk

Tracking and PID with MPGD-based Time Projection Chambers

Wednesday, 25 September 2019 09:55 (20)

Presenter(s) : GASIK, Piotr (TUM, CERN)

Session Classification : Detector Day

Contribution ID : 26 Type : Talk

Drift chamber R&D progress in Novosibirsk

Wednesday, 25 September 2019 10:20 (20)

Presenter(s) : TODYSHEV, Korneliy (BINP)

Session Classification : Detector Day

Contribution ID : 27 Type : Talk

STCF DIRC-like TOF detector R&D (canceled)

Wednesday, 25 September 2019 10:45 (20)

Presenter(s) : LI, Xin (USTC)

Session Classification : Detector Day

Contribution ID : 29 Type : Talk

FARICH PID system option: prototyping and simulation results

Wednesday, 25 September 2019 12:00 (20)

Presenter(s) : KONONOV, Sergey (Budker Institute of Nuclear Physics & Novosibirsk State University)

Session Classification : Detector Day

Contribution ID : 31 Type : Talk

STCF RICH detector design and R&D

Wednesday, 25 September 2019 12:50 (20)

Presenter(s) : LIU, Qian (university of Chinese academy of sciences)

Session Classification : Detector Day

Contribution ID : 33 Type : Talk

STCF ECAL detector design and R&D

Wednesday, 25 September 2019 14:55 (20)

Presenter(s) : ZHANG, Yunlong (USTC)

Session Classification : Detector Day

Contribution ID : 34 Type : Talk

The mu2e crystal calorimeter

Wednesday, 25 September 2019 15:20 (20)

Presenter(s) : HAPPACHER, fabio (INFN-LNF)

Session Classification : Detector Day

Contribution ID : 35 Type : Talk

Muon system for SCTF: Belle2 design adaptation status

Wednesday, 25 September 2019 15:45 (20)

Presenter(s) : UGLOV, Timofey (LPI RAS)

Session Classification : Detector Day

Contribution ID : 36 Type : Talk

Thin solenoid option proposal

Wednesday, 25 September 2019 16:10 (20)

Presenter(s) : BRAGIN, ALEKSEI (Budker Institute of Nuclear Physics)

Session Classification : Detector Day

Contribution ID : 37 Type : Talk

MCP-PMTs as a reliable device for future high energy physics experiments (LAPPD)

Wednesday, 25 September 2019 18:15 (20)

Presenter(s) : NISHIMURA, Kurtis (University of Hawaii)

Session Classification : Detector Day

Contribution ID : 38 Type : Talk

High-speed readout electronics with pico-second resolution for fast MCP-PMTs

Wednesday, 25 September 2019 17:25 (20)

Presenter(s) : Dr WANG, Yonggang (University of Science and Technology of China)

Session Classification : Detector Day

Contribution ID : 40 Type : Talk

Development of readout electronics for the STCF ECAL detector

Wednesday, 25 September 2019 17:50 (20)

Presenter(s) : SHEN, Zhongtao

Session Classification : Detector Day

Contribution ID : 41 Type : Talk

High-speed readout systems

Wednesday, 25 September 2019 17:05 (15)

Presenter(s) : LANGE, Soeren (University Giessen)

Session Classification : Detector Day

Contribution ID : 42 Type : Talk

Status of accelerator conceptual design of super tau charm facility at China

Thursday, 26 September 2019 09:30 (25)

Presenter(s) : LUO, Qing (National Synchrotron Radiation Laboratory, University of Science and Technology of China)

Session Classification : Accelerator Day

Contribution ID : 43 Type : Talk

Status of Novosibirsk SCTF

Thursday, 26 September 2019 10:00 (25)

Presenter(s) : BOGOMYAGKOV, Anton (BINP)

Session Classification : Accelerator Day

Contribution ID : 44 Type : Talk

Luminosity and beam-beam effects for Novosibirsk SCTF

Thursday, 26 September 2019 10:30 (25)

Presenter(s) : SHATILOV, Dmitry (BINP)

Session Classification : Accelerator Day

Contribution ID : 45 Type : Talk

Status of injection facility for Novosibirsk SCTF

Thursday, 26 September 2019 11:00 (25)

Presenter(s) : PETRENKO, Alexey (BINP)

Session Classification : Accelerator Day

Contribution ID : 46 Type : Talk

A novel injection system with no disturbance to storage beam

Thursday, 26 September 2019 12:00 (25)

Presenter(s) : LIU, Tao (USTC)

Session Classification : Accelerator Day

Contribution ID : 47 Type : Talk

Advantages of hybrid positron sources for e+e- colliders

Thursday, 26 September 2019 12:30 (25)

Presenter(s) : Dr CHEHAB, Robert (LAL-IN2P3)

Session Classification : Accelerator Day

Contribution ID : 48 Type : Talk

Beam feedback and IP feedback for STCF

Thursday, 26 September 2019 13:00 (25)

Presenter(s) : ZHOU, Zeran (NSRL/USTC)

Session Classification : Accelerator Day

Contribution ID : 49 Type : Talk

Longitudinal polarization

Thursday, 26 September 2019 14:30 (25)

Presenter(s) : KOOP, Ivan (BINP)

Session Classification : Accelerator Day

Contribution ID : 50 Type : Talk

Compton backscattering for energy calibration

Thursday, 26 September 2019 15:00 (25)

Presenter(s) : MUCHNOI, Nickolai (Budker INP Novosibirsk)

Session Classification : Accelerator Day

Contribution ID : 51 Type : Talk

Machine-detector interface

Thursday, 26 September 2019 15:30 (25)

Presenter(s) : SINYATKIN, Sergey (BINP)

Session Classification : Accelerator Day

Contribution ID : 52 Type : Talk

Superconducting magnets of the final focus

Thursday, 26 September 2019 16:00 (25)

Presenter(s) : OKUNEV, Ivan

Session Classification : Accelerator Day

Contribution ID : 53 Type : Talk

Study on secondary electron emission characteristics of laser etched material surface

Thursday, 26 September 2019 17:00 (25)

Presenter(s) : WANG, Yigang (University of Science and Technology of China)

Session Classification : Accelerator Day

Contribution ID : 54 Type : Talk

Deposition and characterization of low activation temperature TiZrHfV films by DC magnetron sputtering

Thursday, 26 September 2019 17:30 (25)

Presenter(s) : GE, Xiaoqin

Session Classification : Accelerator Day

Contribution ID : 55 Type : Talk

Compact low cost low energy intersecting rings for high current e+e- study and other experiments

Thursday, 26 September 2019 18:00 (25)

Presenter(s) : BOGOMYAGKOV, Anton (BINP)

Session Classification : Accelerator Day

Contribution ID : 57 Type : Talk

Welcome

Tuesday, 24 September 2019 09:20 (10)

Session Classification : Physics Day

Contribution ID : 58 Type : Talk

DIRC options for the SCTF Detector

Wednesday, 25 September 2019 11:10 (20)

In order to guarantee an excellent PID at SCTF, two Cherenkov counters are proposed as one possible design option of the final SCTF detector. Both detectors use the method of detection of internally reflected Cherenkov light, what is called the DIRC concept. The main purpose of these DIRCs is to separate pions and muons up to a momentum of 1 GeV/c with a 4π angular coverage.

Two endcap DIRCs are proposed that cover the forward and backward regions. They consist of a thin fused silica radiator plate each, with attached focusing optics. A third DIRC detector, that will contain fused silica bars and expansion volumes, is going to be designed in a barrel shape around the e^+e^- interaction point. The concept of these detectors is based on existing models that have already been developed for the PANDA detector at FAIR.

This talk will mainly cover the simulation studies that are currently ongoing, which aim to optimize the performance of these detectors with respect to the Cherenkov angle resolution and timing information. The results of these simulations will be used to identify the best optical parameters and readout systems for both detectors. According to the actual plan, silicon photomultipliers (SiPMs) with a high granularity are going to be used to measure single Cherenkov photons. Special optics is going to be required for obtaining a high detector resolution. In addition to that, it will be important to use fast readout electronics to correct for dispersion effects of the created Cherenkov light in fused silica.

Primary author(s) : SCHMIDT, Mustafa (II. Physikalische Institut, Justus-Liebig-Universität Gießen)

Presenter(s) : SCHMIDT, Mustafa (II. Physikalische Institut, Justus-Liebig-Universität Gießen)

Session Classification : Detector Day

Track Classification : Detectors

Contribution ID : 59 Type : Talk

Decays-in-flight muon polarization measurement to extract the Michel parameter ξ' in tau decays.

Tuesday, 24 September 2019 14:00 (20)

We present a feasibility study of muon polarization measurement to extract the Michel parameter ξ' in tau decays. We suggest as method using the angular distribution of electron in the rest frame of decayed in the drift chamber muon, as electron momentum correlates with muon polarization. The Monte Carlo simulation of Belle detector with parameters of SCT beams was used to generate signal events. The possible background was studied and methods of its suppression were suggested. The most contribution is expected from the light mesons decayed in flight and from particles scattering. The reconstruction efficiency and statistical uncertainties were estimated depend on muon polarization.

Primary author(s) : BODROV, Denis (Moscow Institute of Physics and Technology (MIPT))

Presenter(s) : BODROV, Denis (Moscow Institute of Physics and Technology (MIPT))

Session Classification : Physics Day

Track Classification : Physics

Contribution ID : 60 Type : Talk

Semileptonic kaon decays for strong phase measurement

Tuesday, 24 September 2019 11:50 (20)

This work is dedicated to measurement of the strong phases difference between the Cabibbo favoured and doubly Cabibbo suppressed decays of the neutral D-meson for extraction of the D0 anti-D0 mixing parameters. Key feature of this new method is the reconstruction of the neutral kaon (D0->K0 pi0) in semileptonic final state. Using this method time-dependent decay rate of the kaon can provide us with information about strong phase difference. To estimate potential accuracy we perform a feasibility study.

Primary author(s) : POPOV, Vitalii (MIPT)

Presenter(s) : POPOV, Vitalii (MIPT)

Session Classification : Physics Day

Track Classification : Physics

Contribution ID : 61 Type : Talk

Partial-Wave Analysis perspectives in Charm and τ decays

Tuesday, 24 September 2019 12:10 (20)

The large data sets a SCTF facility will produce will new opportunities for Partial-Wave Analyses (PWA) of various final states, of which we will study two example cases.

For τ-events, we study the effects of the missing kinematic information due to the escaping neutrinos and their effect on the results of a PWA.

In D meson decays, how PWA can help to extract CP violating effects and introduce a method to perform such an analysis in a model-independent way, exceeding the model independence of common MIPWA approaches.

Primary author(s) : Dr KRINNER, Fabian (Max Planck Institut für Physik)

Presenter(s) : Dr KRINNER, Fabian (Max Planck Institut für Physik)

Session Classification : Physics Day

Track Classification : Physics