2nd Open Meeting for the Hyper-Kamiokande Project

Report of Contributions

Contribution ID: **0** Type: **not specified**

tmp

Contribution ID: **2** Type: **not specified**

Excavation of the Hyper-K cavern

Monday, 14 January 2013 15:50 (30 minutes)

I will show updates on studies related to the cavern stability, excavation method, waste rock disposal.

Primary author: Prof. SHIOZAWA, Masato (The University of Tokyo, Institute for Cosmic Ray Research, ICRR)

Presenter: Prof. SHIOZAWA, Masato (The University of Tokyo, Institute for Cosmic Ray Research, ICRR)

Session Classification: Cavity and Tank

Track Classification: Cavity and Tanks

Contribution ID: **3** Type: **not specified**

Geomagnetic field compensation

Monday, 14 January 2013 16:50 (20 minutes)

I will present some results from studies on geomagnetic field compensation in the Hyper-K tank, especially an optimization of the compensation coil system.

Primary author: Dr NAKAYAMA, Shoei (Kamioka Observatory, ICRR, University of Tokyo)

Presenter: Dr NAKAYAMA, Shoei (Kamioka Observatory, ICRR, University of Tokyo)

Session Classification: Cavity and Tank

Track Classification: Cavity and Tanks

Contribution ID: **4** Type: **not specified**

Hyper-K liner and PMT support design

Monday, 14 January 2013 16:20 (30 minutes)

Updates of Hyper-K liner and PMT support design will be discussed.

Primary author: Dr TANAKA, Hide-Kazu (ICRR, University of Tokyo)

Presenter: Dr TANAKA, Hide-Kazu (ICRR, University of Tokyo)

Session Classification: Cavity and Tank

Track Classification: Cavity and Tanks

Contribution ID: **5** Type: **not specified**

Computing Strategy for Hyper-Kamiokande

Tuesday, 15 January 2013 14:35 (15 minutes)

A computing strategy that is capable of taking advantage of new technologies (such as Cloud technologies) with minimal impact is needed. The strategy needs to provide a scalable architecture that minimizes the operational overhead. Moreover, long-term data access and preservation are becoming a growing concern worldwide. It has become a requirement in the EU and the US. Incorporating long-term data management practices into the computing strategy from inception will guarantee data-reuse through the capture of sufficient tools and information to understand and reuse the data by a wider audience increasing the value of the data.

Primary author: Prof. DI LODOVICO, Francesca (Queen Mary, University of London)

Presenter: Prof. DI LODOVICO, Francesca (Queen Mary, University of London)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **6** Type: **not specified**

Water for Hyper-K

Monday, 14 January 2013 17:35 (25 minutes)

Plans of water source, pure water system, and water flow in the tank.

Primary author: Dr SEKIYA, Hiroyuki (ICRR/IPMU)

Presenter: Dr SEKIYA, Hiroyuki (ICRR/IPMU)

Session Classification: Water System

Track Classification: Water System

Contribution ID: **7** Type: **not specified**

Preliminary results on water-based liquid scintillator in a proton beam

Monday, 14 January 2013 18:20 (15 minutes)

Samples of water-based liquid scintillator, liquid scintillator and water were exposed to proton beams of kinetic energy 210, 475 and 2000 MeV. Preliminary results on light yield will be presented. Implications for the scientific agenda of future large water Cherenkov detectors will be discussed.

Primary author: JAFFE, David (BNL)

Presenter: JAFFE, David (BNL)

Session Classification: Water System

Track Classification: Water System

Contribution ID: **9** Type: **not specified**

SRN search with HK

Monday, 14 January 2013 14:35 (20 minutes)

In this presentation, SRN sensitivity at HK, with and without Gd option, will be discussed.

Primary author: Dr YANO, Takatomi (Okayama Univ.)

Presenter: Dr YANO, Takatomi (Okayama Univ.)

Session Classification: Physics Potential

Contribution ID: **10** Type: **not specified**

Off-Axis Detectors as Direct Measurements of Neutrino Energy Reconstruction

Monday, 14 January 2013 10:55 (20 minutes)

Uncertainties in neutrino energy reconstruction in quasi-elastic scattering due to nuclear effects may be a significant systematic uncertainty for oscillations measurements at Hyper-K. We investigate the possibility of directly measuring these misreconstructions in a model-independent way with a series of off-axis near detectors.

Primary authors: Prof. MCFARLAND, Kevin (University of Rochester); Dr HARTZ, Mark (University of Toronto and York University)

Presenters: Prof. MCFARLAND, Kevin (University of Rochester); Dr HARTZ, Mark (University of Toronto and York University)

Session Classification: Physics Potential

Contribution ID: **11** Type: **not specified**

Gadolinium for Hyper-K

Monday, 14 January 2013 18:00 (20 minutes)

Progress on the the design and pricing of the water system for the gadolinium option for Hyper-Kamiokande will be presented, as well as the current status of the EGADS gadolinium test project.

Primary author: Prof. VAGINS, Mark (IPMU)

Presenter: Prof. VAGINS, Mark (IPMU)

Session Classification: Water System

Track Classification: Water System

Contribution ID: **12** Type: **not specified**

Considerations for a Near Detector for the Tokai-to-HK experiment

Monday, 14 January 2013 10:35 (20 minutes)

I will discuss considerations for the design and desired capabilities for a near detector for the long-baseline component of the Hyper-Kamiokande physics program (Tokai-to-HK).
My comments will focus mainly on potential incremental upgrades to the existing ND280 off-axis detector for T2K, but will include thoughts on more substantial upgrades.

Primary author: Mr TANAKA, Hirohisa A. (University of British Columbia/Institute of Particle Physics)

Presenter: Mr TANAKA, Hirohisa A. (University of British Columbia/Institute of Particle Physics)

Session Classification: Physics Potential

Contribution ID: **13** Type: **not specified**

Update on Photomultiplier Evaluation and Development in the U.S.

Tuesday, 15 January 2013 10:55 (10 minutes)

A summary of the evaluation of the Hamamatsu 12-inch PMT will be given, along with a status update on the development of an 11-inch ADIT PMT.

Primary author: SVOBODA, Robert (UC Davis)

Presenter: SVOBODA, Robert (UC Davis)

Session Classification: Photodetectors

Track Classification: Photo-Detector and Support

Contribution ID: **14** Type: **not specified**

CP study

Monday, 14 January 2013 09:50 (20 minutes)

An update of CP sensitivity study will be given.

Primary author: YOKOYAMA, Masashi (University of Tokyo)

Presenter: YOKOYAMA, Masashi (University of Tokyo)

Session Classification: Physics Potential

Contribution ID: **15** Type: **not specified**

Considerations for the calibration of water properties and reflection at HK

Tuesday, 15 January 2013 15:45 (15 minutes)

I will discuss considerations for the measurement of the optical properties of the water and reflection off the photosensors at Hyper-Kamiokande, including the necessary calibration devices and analysis methods . The talk will include a review of relevant techniques employed at Super-Kamiokande, SNO and MiniBooNE.

Primary author: Mr TANAKA, Hirohisa A. (University of British Columbia/Institute of Particle Physics)

Presenter: Mr TANAKA, Hirohisa A. (University of British Columbia/Institute of Particle Physics)

Session Classification: Calibrations

Track Classification: Detector Calibration

Contribution ID: **16** Type: **not specified**

Overview of software development towards Hyper-K

Tuesday, 15 January 2013 13:05 (10 minutes)

Recently, we had several progresses in software development for Hyper-Kamiokande. In this talk, I will give a introduction about our activity.

Primary author: Dr MIURA, Makoto (Kamioka Observatory, ICRR, University of Tokyo)

Presenter: Dr MIURA, Makoto (Kamioka Observatory, ICRR, University of Tokyo)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **17** Type: **not specified**

Improvement of proton decay analysis in p−>nu-bar+K^+

Monday, 14 January 2013 13:40 (15 minutes)

The proton decay mode, p−> nu-bar+K^+ is favored by SUSY-GUTs and it is an important analysis for Hyper-K. Recently, there have been several improvement in the alaysis. I will discuss how much sensitivity of Hyper-K will be improved by these improvements.

Primary author: Dr MIURA, Makoto (Kamioka Observatory, ICRR, University of Tokyo)

Presenter: Dr MIURA, Makoto (Kamioka Observatory, ICRR, University of Tokyo)

Session Classification: Physics Potential

Track Classification: Physics Potential

Contribution ID: **18** Type: **not specified**

WCSim strategy and status

Tuesday, 15 January 2013 13:15 (15 minutes)

In this talk I will give an overview of the current use of WCSim for Hyper-K. I will explain our tuning and validation strategy, show current validation work by group members, and introduce the other talks in the session on geometry and calibration.

Primary author: Prof. WALTER, Chris (Duke University)

Presenter: Prof. WALTER, Chris (Duke University)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **19** Type: **not specified**

The Super-KAVE

Tuesday, 15 January 2013 15:15 (10 minutes)

This talk will describe the Super-KAVE, a 3D immersive and interactive event display developed using Duke University's DiVE (Duke immersive Virtual Environment) facility. This event display could easily be adapted to Hyper-K or other experiments, and could be ported to similar facilities elsewhere.

Primary author: Prof. SCHOLBERG, Kate Scholberg (Duke University)

Presenter: Prof. SCHOLBERG, Kate Scholberg (Duke University)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **20** Type: **not specified**

Recent Updates on fiTQun, a New Event Reconstruction Algorithm for Water Cherenkov Detectors

Tuesday, 15 January 2013 14:10 (25 minutes)

fiTQun is a new event reconstruction algorithm which has been developed for the Super-K detector. Using the charge and time information from the photomultiplier tubes in the detector, a likelihood function is constructed, which is then maximized to extract particle track parameters. The new algorithm has the potential to substantially improve particle identification performance as well as vertex and momentum resolutions compared to the existing Super-K reconstruction algorithm. Furthermore, the framework is naturally extendable to complex event topologies that are relevant to atmospheric neutrinos and proton decay. In this talk, an overview on the recent improvements of the fitter, its latest performance, and initial results of validation studies using Super-K controlled samples will be presented. The modularized nature of the new algorithm allows us to adopt the framework to Hyper-K, and the status and our plans for the implementation will also be discussed.

Primary author: Mr TOBAYAMA, Shimpei (University of British Columbia)

Co-authors: Dr WILKING, Michael (TRIUMF); Mr DE PERIO, Patrick (University of Toronto)

Presenter: Mr TOBAYAMA, Shimpei (University of British Columbia)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **21** Type: **not specified**

Muon charge identification with gadolinium-loaded water

Monday, 14 January 2013 11:30 (15 minutes)

A novel approach to muon charge-identification is described. The approach uses the neutron-capture signal available in the presence of gadolinium. Applications to atmospheric neutrino studies are discussed.

Primary author: Dr MAUGER, Christopher (LANL)

Presenter: Dr MAUGER, Christopher (LANL)

Session Classification: Physics Potential

Contribution ID: **22** Type: **not specified**

Neutrinographic imaging of the earth

Monday, 14 January 2013 15:20 (30 minutes)

Absorption neutrinography utilizes very high energy neutrinos with energies above 10 TeV to measure the nucleon density inside the earth whereas oscillation neutrinography measures the electron density by observing the MSW effect. Two independent physical quantities might provide new geophysical information, e.g., isotope ratio, to us. In this talk, a recent attempt to use atmospheric neutrinos for absorption neutrinography, based on a simulation of atmospheric neutrino events that can be collected with the IceCube neutrino detector, will be introduced as well as a possible oscillation neutrinography with Hyper-Kamiokande.

Primary author: TANAKA, Hiroyuki (Earthquake Research Institute)

Presenter: TAKETA, Akimichi (Earthquake Research Institute)

Session Classification: Physics Potential

Contribution ID: **23** Type: **not specified**

Improvement of event selection of proton decay searches

Monday, 14 January 2013 13:25 (15 minutes)

This talk will present studies toward the improvement of
proton decay event selection at HK using shape information from the signal and background distributions instead of pure counting methods used in proton decay searches at SK thus far. Emphasis will be on the p->e+pi0 mode.

Primary author: MINE, Shunichi (UCI)

Co-author: TAKHISTOV, Volodymyr (UCI)

Presenter: MINE, Shunichi (UCI)

Session Classification: Physics Potential

Contribution ID: **24** Type: **not specified**

Photo-detector development for maximizing the overall photon detection efficiency

Tuesday, 15 January 2013 11:05 (15 minutes)

Photo-detector development for maximizing the overall photon detection efficiency
The baseline Hyper-K concept relies on 99,000 20" photomultiplier tubes (PMTs) to provide 20% photo-coverage. We are investigating solutions that would enhance the photo-coverage without compromising either contrast or timing resolution. Contrast roughly quantifies the fraction of photons detected that retain the Cerenkov light directional information over the total number of photons detected including photons having scattered, been reflected or reemitted. Numerous observables, for example low energy neutrino would benefit from enhanced photo-coverage. A large fraction of the photons missing the PMTs could be detected by either using wavelength shifters to guide them towards either the primary PMT or additional PMTs or by using light concentrators to focus the light towards the primary PMTs. Wavelength shifters will worsen the contrast unless the reemitted light can be prevented from entering the active water volume. Dichroic mirrors may do just that by allowing the UV and blue light to be absorbed in the wavelength shifting material and then reflecting the reemitted green light. In general, we are planning to investigate possible applications of interference filters in Hyper-K whether they are used coupled to wavelength shifters, as broadband mirrors for the light collectors, or as anti-reflective films to maximize contrast. We will report our recent investigation of solutions that maximize the detection efficiency.

Primary author: Dr RETIERE, Fabrice (TRIUMF)

Presenter: Dr RETIERE, Fabrice (TRIUMF)

Session Classification: Photodetectors

Track Classification: Photo-Detector and Support

Contribution ID: **25** Type: **not specified**

Calibration source deployment system

Tuesday, 15 January 2013 16:40 (20 minutes)

In this talk I will present a review of the calibration systems that were implemented in the detectors of SNO and Borexino
experiments. I will cover the most important points of each of the systems that will be critical for the design of the Hyper-K source
deployment apparatus and its new requirements. Some of the major points in the discussion will be dedicated to the Borexino style source positioning system with CCD cameras and current ideas on how to achieve an automatic and lightweight design.

Primary author: Mr MANECKI, Szymon (VirginiaTech)

Presenter: Mr MANECKI, Szymon (VirginiaTech)

Session Classification: Calibrations

Track Classification: Detector Calibration

Contribution ID: **26** Type: **not specified**

Spallation background

Monday, 14 January 2013 13:55 (20 minutes)

An estimation of spallation background in HK will be reported.

Primary author: Prof. TAKEUCHI, Yasuo (Dept. of Physics, Grad. School of Science, Kobe Univ.)

Presenter: Prof. TAKEUCHI, Yasuo (Dept. of Physics, Grad. School of Science, Kobe Univ.)

Session Classification: Physics Potential

Contribution ID: **27** Type: **not specified**

Goals of Meeting

Monday, 14 January 2013 09:00 (15 minutes)

I will briefly explain discussion items of the meeting.

Primary author: Prof. SHIOZAWA, Masato (The University of Tokyo, Institute for Cosmic Ray Research, ICRR)

Presenter: Prof. SHIOZAWA, Masato (The University of Tokyo, Institute for Cosmic Ray Research, ICRR)

Session Classification: Opening Session

Track Classification: Opening Session

Contribution ID: **28** Type: **not specified**

Steering Report

Monday, 14 January 2013 09:15 (15 minutes)

Steering Report

Primary author: Prof. NAKAYA, Tsuyoshi (Kyoto University)

Presenter: Prof. NAKAYA, Tsuyoshi (Kyoto University)

Session Classification: Opening Session

Track Classification: Opening Session

Contribution ID: **29** Type: **not specified**

J-PARC and beam-line upgrade

Monday, 14 January 2013 09:30 (20 minutes)

J-PARC and beam-line upgrade

Primary author: Dr ISHIDA, Taku (KEK)

Presenter: Dr ISHIDA, Taku (KEK)

Session Classification: J-PARC and Beamline

Track Classification: Neutrino Beamline

Contribution ID: **30** Type: **not specified**

Atmospheric Neutrino Sensitivity Studies

Monday, 14 January 2013 11:15 (15 minutes)

This talk will present an update of the expected sensitivity to neutrino oscillations at Hyper-K after corrections to the analysis method and updates of the global value of theta_13.

Primary author: WENDELL, Roger (ICRR)

Presenter: WENDELL, Roger (ICRR)

Session Classification: Physics Potential

Contribution ID: **31** Type: **not specified**

Solar neutrinos and supernova burst neutrinos at Hyper-Kamiokande

Monday, 14 January 2013 14:15 (20 minutes)

The sensitivity of solar neutrinos is discussed in this presentation. The modification from the previous meeting will be updated back ground rate from spallation, therefore, the results will be more realistic. Another topics is supernova burst neutrinos. This will be more precise than the discussion in the previous meeting, especially, a correlation with another observation such as gravitational wave.

Primary author: Dr KOSHIO, Yusuke (Kamioka observatory, ICRR, Univ. of Tokyo)

Presenter: Dr KOSHIO, Yusuke (Kamioka observatory, ICRR, Univ. of Tokyo)

Session Classification: Physics Potential

Contribution ID: **32** Type: **not specified**

Low energy calibration

Tuesday, 15 January 2013 16:00 (15 minutes)

The higher level calibration for low energy physics in Hyper-K is discussed. In Super-K, the precise calibration using LINAC, DT and nickel was crucial for make a results. Because of several limitation in Hyper-K, it may not be easy to do the same calibration as Super-K. In this presentation, what is needed for a low energy physics will be discussed.

Primary author: Dr KOSHIO, Yusuke (Kamioka observatory, ICRR, Univ. of Tokyo)

Presenter: Dr KOSHIO, Yusuke (Kamioka observatory, ICRR, Univ. of Tokyo)

Session Classification: Calibrations

Track Classification: Detector Calibration

Contribution ID: **33** Type: **not specified**

HPD development

Tuesday, 15 January 2013 10:15 (20 minutes)

Hybrid Photodetector (HPD) is being developed for Hyper-K and a proof test is planned using a 200-ton tank at Kamioka site.
The development of an 8-inch HPD and a plan for the first proof test will be shown.

Primary author: Dr NISHIMURA, Yasuhiro (ICRR)

Presenter: Dr NISHIMURA, Yasuhiro (ICRR)

Session Classification: Photodetectors

Track Classification: Photo-Detector and Support

Contribution ID: **34** Type: **not specified**

Performance evaluation of 8-inch HPD

An 8-inch Hybrid Photodetector (HPD) for the first
proof-test is developed.
Measured performance will be presented.

Primary author: Ms HIROTA, Seiko (Kyoto Univ.)

Presenter: Ms HIROTA, Seiko (Kyoto Univ.)

Track Classification: Photo-Detector and Support

Contribution ID: **35** Type: **not specified**

HK calibration overview & PMT/electronics calibration

Tuesday, 15 January 2013 15:25 (20 minutes)

I will discuss PMT/electronics calibration and monitoring.

Primary author: Dr TANAKA, Hide-Kazu (ICRR, University of Tokyo)

Presenter: Dr TANAKA, Hide-Kazu (ICRR, University of Tokyo)

Session Classification: Calibrations

Track Classification: Detector Calibration

Contribution ID: **36** Type: **not specified**

A new design of large area MCP-PMT for the next generation neutrino experiments

Tuesday, 15 January 2013 10:35 (20 minutes)

The next generation neutrino experiments call for significantly increasing the total detector volume. Inexpensive PMTs with large size and high efficiency photocathode are needed in order for these experiments to become reality. We have developed a conceptual design of large focusing type PMT aiming for improving the PMT photon detection efficiency. The transmission photocathode coated on the front hemisphere and the reflection photocathode coated on the rear hemisphere are assembled in the same glass envelope to form nearly 4π viewing angle to enhance the efficiency of the photoelectron detection. The two sets of small MCP units replace the traditional dynodes in the center of the big glass pulp. The photoelectrons from the 4π photocathode are collected and amplified by the two sets of MCP units. Some calculations about the photon-electron moving and collecting are introduced. And the prototypes of this kinds of PMT are being made in China.

Primary author: Prof. HENG, Yuekun (Experimental Physics Center, Institute of High Energy Physics)

Presenter: Prof. HENG, Yuekun (Experimental Physics Center, Institute of High Energy Physics)

Session Classification: Photodetectors

Track Classification: Photo-Detector and Support

Contribution ID: **37** Type: **not specified**

Registration

Monday, 14 January 2013 08:00 (1 hour)

Session Classification: Registration

Contribution ID: **38** Type: **not specified**

Discussions

Tuesday, 15 January 2013 17:25 (1 hour)

Session Classification: Discussions

Contribution ID: **39** Type: **not specified**

Sensitivity study (TBD)

Contribution ID: **42** Type: **not specified**

High energy calibration

Tuesday, 15 January 2013 16:15 (15 minutes)

The SK detector calibrations only related to the higher energy physics data analyses (atmospheric neutrino, proton decay, T2K-SK, etc.) will be summarized for the HK detector calibration.

Primary author: Dr MINE, Shunichi (UCI)

Presenter: Dr MINE, Shunichi (UCI)

Session Classification: Calibrations

Track Classification: Detector Calibration

Contribution ID: **43** Type: **not specified**

Outer detector calibration

Tuesday, 15 January 2013 16:30 (10 minutes)

The SK OD calibrations will be reviewed for the HK OD calibration.

Primary author: Dr MINE, Shunichi (UCI)

Presenter: Dr MINE, Shunichi (UCI)

Session Classification: Calibrations

Track Classification: Detector Calibration

Contribution ID: **44** Type: **not specified**

Overview of the photodetector development

Tuesday, 15 January 2013 10:00 (15 minutes)

I will present a brief introduction of current activities in the photodetector sub-WG and the plan for the photodetector development.

Primary author: Dr NAKAYAMA, Shoei (Kamioka Observatory, ICRR, University of Tokyo)

Co-author: Dr NISHIMURA, Yasuhiro (Research Center for Cosmic Neutrinos, ICRR, University of Tokyo)

Presenter: Dr NAKAYAMA, Shoei (Kamioka Observatory, ICRR, University of Tokyo)

Session Classification: Photodetectors

Track Classification: Photo-Detector and Support

Contribution ID: **45** Type: **not specified**

Hyper-K Geometry for WCSim

Tuesday, 15 January 2013 13:30 (10 minutes)

This talk will describe the development of a parameterized geometry model of the Hyper-K detector for use in the WCSim simulation package. Both details of the geometry itself and the status of the implementation will be described.

Primary author: Dr GUMPLINGER, Peter (TRIUMF)

Presenter: Dr GUMPLINGER, Peter (TRIUMF)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **46** Type: **not specified**

WCsim tuning

Tuesday, 15 January 2013 13:40 (15 minutes)

This talk will describe how we used comparisons between SKDetSim, the SuperK detector simulation, and a WCSim simulation of the SuperK geometry to tune the optical properties of the simulation, like reflectivity, scattering, and absorption. The goal was to tune the physical properties of the detector materials in order to improve the simulation accuracy in any geometry.

Primary author: Dr HIMMEL, Alex (Duke University)

Presenter: Dr HIMMEL, Alex (Duke University)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **47** Type: **not specified**

High Energy reconstruction performance

Tuesday, 15 January 2013 13:55 (15 minutes)

This talk will show a comparison between the reconstruction performances of WCSim in its Super-K configuration and those of the actual Super-K simulation called SKDetSim. This comparison was done after the tuning of WCSim to SKDetSim. This talk will show many critical distributions as vertex, direction and momentum resolutions as well as the performances for a T2K-like set of cuts for the nue appearance analysis.

Primary author: Dr AKIRI, Tarek (Duke University)

Presenter: Dr AKIRI, Tarek (Duke University)

Session Classification: Softwares

Track Classification: Software

Contribution ID: **48** Type: **not specified**

Baseline design of the DAQ and Electronics System

Tuesday, 15 January 2013 11:20 (25 minutes)

Present expected trigger rate from dark hits, low energy backgrounds and muons, data rate from those events assuming various photo-sensors' dark rates, low energy background rates and muon rates. Also, discuss the applicability of the simple majority trigger scheme for single/3/5 compartments in one detector.
Referring to these estimation, baseline design will be presented
assuming realistic configurations of the detector.

Primary author: Dr HAYATO, Yoshinari (ICRR, Kamioka)

Presenter: Dr HAYATO, Yoshinari (ICRR, Kamioka)

Session Classification: DAQ and Electronics System

Track Classification: DAQ and Electronics