

NuFact 2018, 20th workshop on neutrinos from accelerators

Report of Contributions

Contribution ID: **1**

Type: **not specified**

Welcome

Contribution ID: 2

Type: **not specified**

Overview of Neutrino Physics

Monday, August 13, 2018 9:00 AM (45 minutes)

Presenter: ATSUKO, Ichikawa (Kyoto University)

Session Classification: Plenary I

Contribution ID: 3

Type: **not specified**

Status of accelerator-based Neutrino Physics

Monday, August 13, 2018 9:45 AM (45 minutes)

Presenter: VAHLE, Patricia (William & Marry)

Session Classification: Plenary I

Contribution ID: 4

Type: **not specified**

Welcome

Monday, August 13, 2018 8:45 AM (15 minutes)

Contribution ID: 5

Type: **not specified**

WG1 Goals for the Meeting

Monday, August 13, 2018 11:00 AM (15 minutes)

Presenter: MCCAULEY, Neil

Session Classification: Plenary II

Contribution ID: 6

Type: **not specified**

WG2 Goals for the Meeting

Monday, August 13, 2018 11:15 AM (15 minutes)

Presenter: Mr NIEWCZAS, Kajetan

Session Classification: Plenary II

Contribution ID: 7

Type: **not specified**

WG3 Goals for the Meeting

Monday, August 13, 2018 11:30 AM (15 minutes)

Presenter: SEKIGUCHI, Tetsuro

Session Classification: Plenary II

Contribution ID: 8

Type: **not specified**

WG4 Goals for the Meeting

Monday, August 13, 2018 11:45 AM (15 minutes)

Presenter: GROUP, Craig

Session Classification: Plenary II

Contribution ID: 9

Type: **not specified**

WG5 Goals for the Meeting

Monday, August 13, 2018 12:00 PM (15 minutes)

Presenter: BONIVENTO, Water (INFN Cagliari)

Session Classification: Plenary II

Contribution ID: **10**

Type: **not specified**

Status and Future of high-power Proton Drivers

Tuesday, August 14, 2018 9:00 AM (30 minutes)

Presenter: COUSINEAU, Sarah (ORNL)

Session Classification: Plenary III

Contribution ID: **11**

Type: **not specified**

Status and Future of high-power Neutrino Target Stations

Tuesday, August 14, 2018 9:30 AM (30 minutes)

Presenter: HYLEN, Jim (FNAL)

Session Classification: Plenary III

Contribution ID: 12

Type: **not specified**

Results and Prospects from NOvA

Tuesday, August 14, 2018 10:00 AM (30 minutes)

Presenter: BIAN, Jianming (U Minnesota)

Session Classification: Plenary III

Contribution ID: 13

Type: **not specified**

Results and Prospects from T2K

Tuesday, August 14, 2018 11:00 AM (30 minutes)

Presenter: DENNIS, Stephen

Session Classification: Plenary IV

Contribution ID: **14**

Type: **not specified**

Results from IceCube

Tuesday, August 14, 2018 11:30 AM (30 minutes)

Presenter: ARGUELLES, Carlos (MIT)

Session Classification: Plenary IV

Contribution ID: 15

Type: **not specified**

Status and Physics of JUNO

Tuesday, August 14, 2018 12:00 PM (30 minutes)

Presenter: DING, Xuefeng (Gran Sasso Science Insitute)

Session Classification: Plenary IV

Contribution ID: **16**

Type: **not specified**

Coherent Scattering Results and Future

Friday, August 17, 2018 12:00 PM (30 minutes)

Presenter: BARBEAU, Phil (Duke)

Session Classification: Plenary X

Contribution ID: 17

Type: **not specified**

LHC Results on heavy Neutrino Searches

Thursday, August 16, 2018 9:30 AM (20 minutes)

Presenter: YANG, Un Ki

Session Classification: Plenary VII

Contribution ID: **18**

Type: **not specified**

FNAL SBL Program Status

Thursday, August 16, 2018 9:50 AM (20 minutes)

Presenter: FAVA, Angela (FNAL)

Session Classification: Plenary VII

Contribution ID: **19**

Type: **not specified**

Status of T2HK

Thursday, August 16, 2018 10:10 AM (20 minutes)

Presenter: BLONDEL, Alain

Session Classification: Plenary VII

Contribution ID: **20**

Type: **not specified**

Status of DUNE

Thursday, August 16, 2018 11:00 AM (30 minutes)

Presenter: GOLLAPINNI, Sowjana

Session Classification: Plenary VIII

Contribution ID: **21**

Type: **not specified**

Status of ESSnuB

Thursday, August 16, 2018 11:30 AM (20 minutes)

Presenter: DRACOS, Marcos

Session Classification: Plenary VIII

Contribution ID: 22

Type: **not specified**

MICE Results

Thursday, August 16, 2018 11:50 AM (20 minutes)

Presenter: SOLER, Paul

Session Classification: Plenary VIII

Contribution ID: 23

Type: **not specified**

Low Emittance Muon Accelerator

Thursday, August 16, 2018 12:10 PM (20 minutes)

Presenter: BOSCOLO, Manuela

Session Classification: Plenary VIII

Contribution ID: 24

Type: **not specified**

Electron Scattering

Wednesday, August 15, 2018 8:00 AM (30 minutes)

Presenter: PANDEY, Vishvas (Virginia Tech)

Session Classification: Plenary V

Contribution ID: 25

Type: **not specified**

Recent Results from MINERVA

Wednesday, August 15, 2018 8:30 AM (30 minutes)

Presenter: CARNEIRO, Mateus

Session Classification: Plenary V

Contribution ID: 26

Type: **not specified**

Review of Tension in Data/Models of Neutrino Cross Sections

Wednesday, August 15, 2018 9:00 AM (30 minutes)

Presenter: MAHN, Kendall

Session Classification: Plenary V

Contribution ID: 27

Type: **not specified**

Recent Results from the T2K Near Detector

Wednesday, August 15, 2018 10:00 AM (20 minutes)

Presenter: LU, Xianguo

Session Classification: Plenary VI

Contribution ID: **28**

Type: **not specified**

T2K Near Detector Upgrades and Plans for T2HK

Wednesday, August 15, 2018 10:20 AM (20 minutes)

Presenter: LUX, Thorsten

Session Classification: Plenary VI

Contribution ID: **29**

Type: **not specified**

DUNE Near Detector Plans

Wednesday, August 15, 2018 10:40 AM (20 minutes)

Presenter: DE ROECK, Albert

Session Classification: Plenary VI

Contribution ID: **30**

Type: **not specified**

nuSTORM Facility and Report from Cross Section Workshop

Wednesday, August 15, 2018 11:00 AM (30 minutes)

Presenter: LONG, Ken (Imperial College London)

Session Classification: Plenary VI

Contribution ID: **31**

Type: **not specified**

Pulsed Muon Beam Physics

Friday, August 17, 2018 9:00 AM (30 minutes)

Presenter: LANCASTER, Mark

Session Classification: Plenary IX

Contribution ID: **32**

Type: **not specified**

DC Muon Beam Physics

Friday, August 17, 2018 9:30 AM (30 minutes)

Presenter: PAPA, Angela

Session Classification: Plenary IX

Contribution ID: 33

Type: **not specified**

SBL Reactor Experiments

Friday, August 17, 2018 10:00 AM (30 minutes)

Presenter: ZHANG, Chao (BNL)

Session Classification: Plenary IX

Contribution ID: **34**

Type: **not specified**

Global Neutrino Oscillation Fits

Friday, August 17, 2018 11:00 AM (30 minutes)

Presenter: KARAGIORGI, Georgia (Columbia)

Session Classification: Plenary X

Contribution ID: 35

Type: **not specified**

Neutrino Dark Matter Connections

Friday, August 17, 2018 11:30 AM (30 minutes)

Presenter: KRNJAIC, Gordon

Session Classification: Plenary X

Contribution ID: 36

Type: **not specified**

BSM Neutrino Theory

Session Classification: Plenary X

Contribution ID: 37

Type: **not specified**

WG4 Summary

Saturday, August 18, 2018 11:00 AM (30 minutes)

Presenter: GROUP, Craig

Session Classification: Plenary Summary II and Closeout

Contribution ID: **38**

Type: **not specified**

WG5 Summary

Saturday, August 18, 2018 11:30 AM (30 minutes)

Presenter: BONIVENTO, Water (INFN Cagliari)

Session Classification: Plenary Summary II and Closeout

Contribution ID: **39**

Type: **not specified**

Closing Talk

Saturday, August 18, 2018 12:00 PM (45 minutes)

Presenter: FRIEDLAND, Alex (SLAC)

Session Classification: Plenary Summary II and Closeout

Contribution ID: **40**

Type: **not specified**

WG1 Summary

Saturday, August 18, 2018 9:00 AM (30 minutes)

Presenter: BIAN, Jianming (U Minnesota)

Session Classification: Plenary Summary I

Contribution ID: 41

Type: **not specified**

WG2 Summary

Saturday, August 18, 2018 9:30 AM (30 minutes)

Presenter: Dr PANDEY, Vishvas

Session Classification: Plenary Summary I

Contribution ID: 42

Type: **not specified**

WG3 Summary

Saturday, August 18, 2018 10:00 AM (30 minutes)

Presenter: FREEMIRE, Ben (Northern Illinois University)

Session Classification: Plenary Summary I

Contribution ID: 43

Type: **not specified**

Final results from the OPERA experiment in the CNGS neutrino beam

The OPERA experiment at the Gran Sasso Laboratory was designed to study $\nu_\mu \rightarrow \nu_\tau$ oscillations in appearance mode in the CERN-to-Gran Sasso neutrino beam. We report the final analysis of the full data sample based on looser selection criteria than in previous analyses and multivariate approach. Oscillation parameters have been determined with a reduced statistical uncertainty, and the discovery of tau neutrino appearance is confirmed with an improved significance level. Moreover, the search for electron neutrino events has been extended to the full dataset exploiting an improved method for the electron neutrino energy estimation. New limits have been set in the 3+1 neutrino model.

Primary author: TENTI, Matteo (INFN)

Presenter: TENTI, Matteo (INFN)

Session Classification: Posters & welcome reception

Contribution ID: 44

Type: **not specified**

Modeling neutrino-nucleus interactions in the few-GeV region

A good understanding of neutrino-nucleus scattering mechanisms is essential to reduce the systematic errors in neutrino oscillation experiments. Recent interest of the Ghent group focus on providing a consistent description of this process in the intermediate energy region. We describe the low energy response with collective nuclear excitations and the quasielastic peak using a Hartree-Fock-CRPA (continuum random phase approximation) model that takes into account nuclear long-range correlations as well as hadronic final-state interactions. The two-body current mechanisms, which are especially important in the region between the quasielastic and the delta-resonance peak, are included through short-range correlations and meson-exchange currents, treated within the same mean-field based model. Our description of intermediate-energy neutrino-nucleus scattering is completed by modeling neutrino-induced pion production. For that, we consider the dominant contribution from the decay of the delta resonance as well as other terms required by chiral symmetry, working in a fully relativistic formalism with a refined treatment of nuclear effects.

Primary author: Mr NIEWCZAS, Kajetan (Ghent University)

Co-authors: Mr NIKOLAKOPOULOS, Alexis (Ghent University); Dr NYS, Jannes (Ghent University); Prof. JACHOWICZ, Natalie (Ghent University); Mr VAN DESSEL, Nils (Ghent University); Dr GONZÁLEZ-JIMÉNEZ, Raúl (Complutense University of Madrid); Dr PANDEY, Vishvas (Virginia Tech)

Presenter: Mr NIEWCZAS, Kajetan (Ghent University)

Session Classification: Posters & welcome reception

Contribution ID: 45

Type: **not specified**

Distinguishing muon LFV effective couplings using $\mu^+e^- \rightarrow e^+e^-$

We discuss how to discriminate muon LFV couplings one from the other using the mode $\mu^+e^- \rightarrow e^+e^-$.

Primary author: SATO, Joe (Saitama University)

Presenter: SATO, Joe (Saitama University)

Session Classification: Posters & welcome reception

Contribution ID: 47

Type: **not specified**

The Mu2e Experiment at Fermilab

The Muon-to-Electron-Conversion (Mu2e) Experiment is a high-precision, intensity-frontier experiment being developed at Fermilab which will search for coherent, neutrino-less muon to electron conversion in the presence of an atomic nucleus. Such a process would exhibit charged lepton flavor violation (CLFV), which has not yet been observed. Continuing the search for CLFV, Mu2e will improve the sensitivity by four orders of magnitude over the present limits. In the search for beyond the standard model (BSM) physics, Mu2e is uniquely sensitive to a wide range of models by indirectly probing mass scales up to the energy scale of 10^4 TeV. While muon-to-electron-conversion is permissible in the standard model through neutrino oscillations, the rate is extremely low at about one event in 10^{12} . By design, the background for the experiment will be well-understood and kept at a sub-event level, which will mean the observation of muon-to-electron conversion is a direct confirmation of BSM physics. The physics motivation, the design, and the current status of the experiment will be presented.

Primary author: BOI, Steve (Virginia)

Co-author: GROUP, Craig (University of Virginia)

Presenter: BOI, Steve (Virginia)

Session Classification: Posters & welcome reception

Contribution ID: 48

Type: **not specified**

A High-efficiency Cosmic Ray Veto Detector for the Mu2e Experiment

The Mu2e experiment at Fermilab will search for the charged lepton flavor violating process of coherent muon-to-electron conversion in the presence of a nucleus with a sensitivity four orders of magnitude beyond current limits. The experiment will have a single event sensitivity of about 3×10^{-17} while limiting the total background to about 0.5 events. One potential background is due to cosmic-ray muons producing an electron that is indistinguishable from signal within the Mu2e apparatus. The cosmic-ray-veto system of the Mu2e experiment is tasked with vetoing cosmic-ray-induced backgrounds with high efficiency, without inducing significant dead time and while operating in a high-intensity environment. The design of the cosmic-ray-veto system will be discussed.

Primary authors: BARTON, Ben (Virginia); MILLS, Danny (Virginia)

Co-author: GROUP, Craig (University of Virginia)

Presenters: BARTON, Ben (Virginia); MILLS, Danny (Virginia)

Session Classification: Posters & welcome reception

Contribution ID: 49

Type: **not specified**

Performance of Scintillation Counters as Measured at the Fermilab Test Beam Facility for the Mu2e Cosmic Ray Veto System

Photoelectron yields of extruded scintillation counters with titanium dioxide coating and embedded wavelength shifting fibers read out by silicon photomultipliers have been measured at the Fermilab Test Beam Facility using 120 GeV protons. The yields were measured as a function of transverse, longitudinal, and angular positions for a variety of scintillator compositions, reflective coating mixtures, and fiber diameters. Timing performance was also studied. These studies were carried out by the Cosmic Ray Veto Group of the Mu2e collaboration as part of their R&D program.

Primary author: CHEN, Ningshun (Virginia)

Co-author: GROUP, Craig (University of Virginia)

Presenter: CHEN, Ningshun (Virginia)

Session Classification: Posters & welcome reception

Contribution ID: 50

Type: **not specified**

Fabrication of A High-efficiency Cosmic Ray Veto Detector for the Mu2e Experiment

The Mu2e experiment at Fermilab will search for the charged-lepton-flavor-violating process of coherent muon-to-electron conversion in the presence of a nucleus with a sensitivity four orders of magnitude beyond the current strongest limits. The goal of single-event sensitivity requires that all backgrounds must sum to significantly less than one event. One potential background is due to cosmic-ray muons producing an electron with signal characteristics within the Mu2e apparatus. The cosmic-ray-veto system of the Mu2e experiment is tasked with vetoing such cosmic-ray-induced backgrounds with high efficiency while inducing low dead time and while operating in the high-intensity environment of the Mu2e experiment. The UVA HEP group has been leading the effort to design and prototype the CRV and has recently started the fabrication this detector on site. Highlights of this effort including production detector performance will be presented.

Primary authors: BARTON, Ben (Virginia); MILLS, Danny (Virginia)

Co-author: GROUP, Craig (University of Virginia)

Presenters: BARTON, Ben (Virginia); MILLS, Danny (Virginia)

Session Classification: Posters & welcome reception

Contribution ID: 51

Type: **not specified**

Performance of Wavelength-Shifting Fibers for the Mu2e Cosmic Ray Veto Detector

The Mu2e experiment will search for a neutrino-less muon-to-electron conversion process with almost four orders of magnitude of sensitivity improvement relative to the current best limit. One important background is caused by cosmic ray muons, and particles produced by their decay or interactions, mimicking the conversion electron signature. In order to reach the design sensitivity, Mu2e needs to obtain a cosmic ray veto (CRV) efficiency of 99.99%. The CRV system consists of four layers of plastic scintillating counters read out by silicon photo-multipliers (SiPM) through wavelength shifting fibers. The CRV counters must produce sufficient photo statistics in order to achieve the required veto efficiency. We study the light properties of several wavelength shifting fiber sizes in order to optimize the total light yield for the CRV system. The measurements are performed using a scanner designed to ensure fiber quality for the CRV. Results from prototype and production fiber studies will be presented.

Primary author: FARRIS, Peter (Virginia)

Co-author: GROUP, Craig (University of Virginia)

Presenter: FARRIS, Peter (Virginia)

Session Classification: Posters & welcome reception

Contribution ID: 52

Type: **not specified**

Studies of the Aging Properties of the Mu2e Cosmic Ray Veto System

The Muon-to-Electron Conversion experiment (Mu2e) operates at extremely high sensitivities, requiring a means of reducing experimental background. The Cosmic Ray Veto system (CRV) is a particle detector that will surround the Mu2e apparatus to veto penetrating particles that present background. The CRV must have a detection efficiency of 99.99% throughout the expected three year lifetime of the Mu2e experiment. The CRV is comprised of extruded polystyrene scintillating strips and fiber which degrade over time, decreasing the efficiency of the CRV. Using a standard accelerated aging technique, several scintillator and fiber samples were heated to increase their rate of degradation. The results of these studies and the impact of aging on the CRV will be presented.

Primary author: OKSUZIAN, Yuri (Virginia)

Co-author: GROUP, Craig (University of Virginia)

Presenter: OKSUZIAN, Yuri (Virginia)

Session Classification: Posters & welcome reception

Contribution ID: 53

Type: **not specified**

Neutrino trident production at near detectors

The large statistics expected at the near detectors of neutrino oscillation experiments opens up the possibility to search for rare neutrino interactions. One example is neutrino trident production, the scattering of a neutrino by the Coulomb field of a nucleus producing a pair of charged leptons. In this talk, I will revisit the calculation of the trident scattering rate, addressing certain inconsistencies in the literature and presenting revised predictions for the total and differential event rates for relevant experiments. I will then argue that backgrounds can be kept under control and that certain channels could be seen for the first time at these facilities. Finally, I will dedicate some time to discuss what kind of new physics one can look for in these processes.

Primary author: Mr HOSTERT, Matheus (IPPP, Durham University)

Presenter: Mr HOSTERT, Matheus (IPPP, Durham University)

Session Classification: Posters & welcome reception

Contribution ID: 54

Type: **not specified**

Search for $K^+ \rightarrow \pi^+ \nu \nu$ at CERN

The decay $K^+ \rightarrow \pi^+ \nu \nu$, with a very precisely predicted branching ratio of less than 10^{-10} , is one of the best candidates to reveal indirect effects of new physics at the highest mass scales. The NA62 experiment at CERN SPS is designed to measure the branching ratio of the $K^+ \rightarrow \pi^+ \nu \nu$ with a decay-in-flight technique, novel for this channel. NA62 took data in 2016, 2017 and another year run is scheduled in 2018. Statistics collected in 2016 allows NA62 to reach the Standard Model sensitivity for $K^+ \rightarrow \pi^+ \nu \nu$, entering the domain of 10^{-10} single event sensitivity and showing the proof of principle of the experiment. The analysis data is reviewed and the preliminary result from the 2016 data set presented.

Primary author: Mr TRILOV, Stoyan

Presenter: Mr TRILOV, Stoyan

Session Classification: Posters & welcome reception

Contribution ID: 55

Type: **not specified**

The search for neutral currents in muonic X-rays

Muonic X-ray measurements at the Paul Scherrer Institute

Negative muons at rest quickly get captured by nearby atoms in highly excited atomic states. These muonic atoms subsequently de-excite via radiative and Auger transitions until the muon ends up in the 1s orbital. At the lower orbits, there is substantial overlap between the muon wave function and the nucleus, making this system an excellent laboratory to study the interaction between the muon and atomic nucleus.

MuX is a renewed effort at the Paul Scherrer to measure muonic X-rays in medium- and high-Z nuclei, fully exploiting the coverage and multiplicity of a germanium detector array and the high yield of negative muons available. The physics program focuses on atomic parity violation (APV). A measurement of the charge radius of ^{226}Ra , derived from the 2s-1s transition energy, will serve as crucial input for an upcoming APV experiment with a single Ra ion. A second measurement program is exploring the possibility of measuring APV directly in muonic atoms. In the Standard Model, APV arises from the mixing of the opposite parity 2p and 2s atomic states, leading to parity violation in the 2s-1s transition. We focus on $Z=30$ nuclei, where a measurable branching ratio of the single photon 2s-1s transition is expected. The high granularity of a large solid angle germanium detector array is exploited to suppress background from more intense transitions in the cascade.

In the summer of 2017, we successfully commissioned a novel target for the ^{226}Ra charge radius measurement, which is planned to run in 2018. In addition, 2 weeks of beam time were dedicated to observe the 2s-1s transition for the first time, and quantify the background.

Primary author: WAUTERS, Frederik (Johannes Gutenberg Universitaet Mainz)

Presenter: WAUTERS, Frederik (Johannes Gutenberg Universitaet Mainz)

Session Classification: Posters & welcome reception

Contribution ID: 56

Type: **not specified**

Recent results of neutrino interactions from the T2K Near Detector

Neutrino-nucleus cross-section measurements in the GeV regime are crucial for future accelerator-based precision neutrino oscillation measurements. The T2K Near Detector has provided important results for the study of nuclear effects in neutrino-nucleus interactions and therefore stringent constraints on model development. In this talk, I will present our recent cross-section measurements, highlight on-going progress and discuss future possible developments in T2K.

Primary author: LU, Xianguo

Presenter: LU, Xianguo

Session Classification: Posters & welcome reception

Contribution ID: 57

Type: **not specified**

Details of the T2K oscillation analyses

T2K is a long-baseline neutrino experiment in which a muon neutrino beam produced by J-PARC in Tokai is sent 295 km across Japan to the Super-Kamiokande detector. The experiment studies neutrino oscillations via the disappearance of muon neutrinos and the appearance of electron neutrinos. T2K has conclusively observed muon neutrino to electron neutrino oscillations, opening the door to the observation of CP violation in the lepton sector. Since 2014, the experiment has run alternating neutrino and antineutrino beams in order to precisely measure the corresponding oscillation probabilities, resulting in leading measurements of the muon antineutrino disappearance parameters and results on CP violation in the lepton sector. Different oscillation analyses are performed. They differ for the adopted statistical approach, either frequentist or bayesian, and the kinematical variables used for the analysis templates. In this talk, we will present recently-updated results, focusing on the details of the oscillation analysis methods.

Primary author: SGALABERNA, Davide (CERN)

Presenter: SGALABERNA, Davide (CERN)

Session Classification: Posters & welcome reception

Contribution ID: 58

Type: **not specified**

Constraining neutrino transition magnetic moments

We are presenting a preliminary results on the studies of neutrino transition magnetic moments using DUNE LAr, HK and JUNO detectors. Neutrinos, if Majorana particles, the combined effect of magnetic field and matter effect in core-collapse Super Nova can transform some of ν_e to $\bar{\nu}_e$ due to spin flavour conversions. As a result of this conversions the inverse beta decay signal will have an increment indicating evidence of transition magnetic moments. The DUNE LAr is sensitive to ν_e so will observed a deficiency of ν_e due to this conversion whereas both HK and JUNO which are sensitive to $\bar{\nu}_e$ will see excess of $\bar{\nu}_e$. The DUNE LAr and JUNO are more or less sensitive to other type of neutrinos due to use of ^{40}Ar and ^{12}C . So can estimate the event ratio using both neutrinos and hence sensitivity on transition magnetic moments. Even an non observation of such conversion put a restrictive bounds on the neutrino transition magnetic moments.

Primary authors: Dr DASH, Nitali (Institute of Hienergy Physics, Chinese Academy of Sciences, Beijing 100049, China); Dr MOHARANA, Reetanjali (The Racha Institute of Physics, 91904 Jerusalem, Israel); Dr CAO, Guofu (Institute of Hienergy Physics, Chinese Academy of Sciences, Beijing 100049, China)

Presenter: Dr DASH, Nitali (Institute of Hienergy Physics, Chinese Academy of Sciences, Beijing 100049, China)

Session Classification: Posters & welcome reception

Contribution ID: 59

Type: **not specified**

Muonic X-ray measurements with radioactive elements

Muonic X-rays are an excellent tool to measure the nuclear charge radius, the radii of almost all stable nuclei have been measured with this method. More challenging are radioactive nuclei due to the amount of material needed to stop negative muons produces at accelerator facilities. At the Paul Scherrer Institute we have developed a novel method, stopping the muons is a gaseous hydrogen-deuterium mixture. Initially muonic hydrogen is formed, then the muon transfers to deuterium. Due to a minimum in the scattering cross section, this muonic deuterium quickly reaches the target chambers walls, where the muons transfer a higher Z element. A layer as thin as a few nanometers of the element of interest is sufficient to produce the muonic atoms with a efficiency of O(10%). We aim to measure the muonic X-rays in ^{226}Ra . The charge radius derived from this data will serve as a crucial input for an upcoming atomic parity violation experiment with a single trapped radium atom.

Primary authors: WAUTERS, Frederik (Johannes Gutenberg Universitaet Mainz); Mr SKAWRAN, Alexander (ETH)

Presenter: WAUTERS, Frederik (Johannes Gutenberg Universitaet Mainz)

Session Classification: Posters & welcome reception

Contribution ID: 60

Type: **not specified**

Constraints on neutrino decay scenarios with electron anti-neutrino disappearance experiments.

Neutrino decay provides a very interesting case for the “beyond PMNS” neutrino physics. It has been shown that this phenomenon can also explain some of the anomalies seen in neutrino experiments. We study the constraints that $\bar{\nu}_e$ disappearance experiments like JUNO and KamLAND can put on neutrino decay scenarios. In particular, we consider a model where a heavier neutrino can decay giving active daughter neutrinos which can then be detected in these experiments. We find that the experiments JUNO and KamLAND can together constrain $\tau_3/m_3 \ 10^{-10} \text{ s/eV}$ for the normal hierarchy and $\tau_2/m_2 \ 10^{-9} \text{ s/eV}$ for the inverted hierarchy. We discuss an interesting physics case because of which the bounds are better for the inverted hierarchy. Unlike ν_e appearance experiments, the $\bar{\nu}_e$ disappearance events do not change much depending on whether the decay products are visible or not. This is due to the smallness of $|U_{e3}|$.

Primary author: PRAKASH, Suprabh (IFGW, Unicamp)

Co-authors: Mr PORTO SILVA, Yago Phillipe (Instituto de Fisica Gleb Watagin); Dr L. G. PERES, Orlando (Instituto de Fisica Gleb Wataghin); Dr NUNOKAWA, Hiroshi (PUC, Rio de Janeiro); Dr MINAKATA, Hisakazu (IFT, UAM)

Presenter: PRAKASH, Suprabh (IFGW, Unicamp)

Session Classification: Posters & welcome reception

Contribution ID: 61

Type: **not specified**

Recent Cross Section Results from T2K

Measurements of the PMNS oscillation parameters by the T2K experiment are improving our understanding of neutrino mixing. Using the two multi-purpose near detectors, ND280 and INGRID, T2K also extensively measures neutrino-nucleus interactions in the low GeV region. With multiple targets and on/off-axis detector placement, the near detectors investigate target dependence and the effects of different neutrino fluxes. This talk introduces T2K and its cross section measurements, with emphasis on recent and upcoming results.

Primary author: Mr WRET, Clarence (University of Rochester)

Presenter: Mr WRET, Clarence (University of Rochester)

Session Classification: Posters & welcome reception

Contribution ID: 62

Type: **not specified**

The Role of Cross Sections in the Oscillation Analysis: The T2K Experience

The T2K experiment measures long baseline neutrino oscillations with neutrinos in the 0.1-1.5 GeV energy range. Thanks to excellent beam performance T2K is rapidly gathering statistics, increasing the relative importance of the parameterisation of systematics. Neutrino-nucleus interactions are large contributors to the error budget at T2K, affecting crucial components such as neutrino energy estimation and event selection. This talk gives an overview of T2K's treatment of interaction systematics, the constraints that are placed upon them, and their impact on oscillation analyses.

Primary author: WRET, Clarence (University of Rochester)

Presenter: WRET, Clarence (University of Rochester)

Session Classification: Posters & welcome reception

Contribution ID: 63

Type: **not specified**

Mini-CAPTAIN measurements in the LANSCE WNR Neutron Beam

All neutrino experiments face the problem of reconstructing the incoming neutrino energy using the visible interaction products. Unfortunately, the initial neutrino interaction is not well understood, not all of the interaction products are visible, and the secondary interactions may not be well understood. In preparation the analysis of neutrino oscillation data collected using liquid argon time projection chambers, the CAPTAIN collaboration is addressing this problem with a measurement of the cross section of neutrons impinging on an argon target. Using the WNR neutron facility, which produces a well known flux of neutrons up to a kinetic energy of 800 MeV, the total cross section will be measured for neutron kinetic energies above approximately 50 MeV, and partial cross sections will be measured for $n + \text{Ar} \rightarrow p + X$ and $n + \text{Ar} \rightarrow \pi^\pm + X$. Data for this measurement was collected during the Summer of 2017 using a 400 kg fiducial Liquid Argon TPC that was instrumented with a photon-detection system (PDS). The interaction by interaction neutron energy is determined using time of flight as determined by the PDS while the ionization yield is measured in the TPC.

Primary author: MCGREW, Clark (Stony Brook University)

Presenter: MCGREW, Clark (Stony Brook University)

Session Classification: Posters & welcome reception

Contribution ID: 64

Type: **not specified**

Future prospects for CAPTAIN experiment

The CAPTAIN (Cryogenic Apparatus for Precision tests of Argon Interactions with Neutrinos) experiment is a five-ton liquid argon time projection chamber (LArTPC) at Los Alamos National Laboratory. CAPTAIN is designed to make measurements of liquid argon interactions relevant to neutrino physics in particular for the proposed Deep Underground Neutrino Experiment (DUNE). A prototype detector called Mini-CAPTAIN, with 400 kg of liquid argon, collected data at a neutron beam at LANL in the summer of 2017. We present plans for the future of the CAPTAIN experiment to take data at other neutrino sources and measure low-energy neutrino interactions on argon.

Primary author: CHAVES, Jorge (University of Pennsylvania)

Presenter: CHAVES, Jorge (University of Pennsylvania)

Session Classification: Posters & welcome reception

Contribution ID: 65

Type: **not specified**

Studying Neutral Current Elastic Scattering and the Strange Axial Form Factor in MicroBooNE

One of the least constrained contributions to the neutral current (NC) elastic neutrino-proton cross section is the strange axial form factor, which represents the strange quark spin contribution to the spin of the proton. Knowledge of this form factor is important for many areas of physics including sterile neutrino searches, spin-dependent dark matter searches, and supernova explosion mechanisms. The strange axial form factor can be determined by studying NC elastic scattering events in the MicroBooNE detector at low negative four-momentum transfer squared (Q^2). MicroBooNE's unique ability to detect low-energy protons is expected to allow the measurement of these events with a Q^2 as low as 0.10 GeV^2 . We present a selection of neutral current elastic events in a subset of MicroBooNE neutrino data, as well as our plan to extract the strange axial form factor from this selection in the full data set.

Primary author: WOODRUFF, Katherine (New Mexico State University)

Presenter: WOODRUFF, Katherine (New Mexico State University)

Session Classification: Posters & welcome reception

Contribution ID: 66

Type: **not specified**

Recent progress on radiation damage studies at RaDIATE

In the recent past, major accelerator facilities have been limited in beam power not by their accelerators but by target and/or window survivability. With present plans to upgrade accelerator facilities at FNAL and J-PARC to higher beam powers (1.2+ MW) in the next decade, timely R&D of robust high power targets and beam windows is needed to fully realize the physics benefits of the higher beam power. An international team of researchers, under the aegis of the Radiation Damage In Accelerator Target Environments (RaDIATE) Collaboration, fabricated test specimens which were irradiated by 181 MeV protons in the Brookhaven Linac Isotope Producer (BLIP) facility at BNL, starting in spring of 2017. Test specimens, including candidate materials for various beam intercepting device applications, were provided by participating facilities. Post-irradiation examination (PIE) is being conducted at participating RaDIATE institutions with appropriate “hot-cell” facilities. The work includes efforts to provide BLIP irradiated samples to in-beam thermal shock test at CERN’s HiRadMat beam-line facility. Thermal shock testing in beam allows observation of how the radiation damaged property data affects material behavior when exposed to actual beam loading conditions. The HiRadMat beam-line experiment proposal was accepted by the HiRadMat Scientific Board and is currently scheduled to run in October, 2018. In this talk up-to-date status of the experiments, PIEs, and prospect for the works conducted by RaDIATE collaboration will be over-viewed.

Primary author: Dr ISHIDA, Taku (J-PARC/KEK)

Co-author: Mr HURH, Patrick G. (FNAL)

Presenter: Dr ISHIDA, Taku (J-PARC/KEK)

Session Classification: Posters & welcome reception

Contribution ID: 67

Type: **not specified**

Nuclear Theory, Data and Event Generators

Monday, August 13, 2018 2:00 PM (30 minutes)

Presenter: Dr VAN ORDEN, Wally

Session Classification: WG2

Contribution ID: **68**

Type: **not specified**

Ab Initio Methods

Monday, August 13, 2018 2:30 PM (30 minutes)

Presenter: Dr LOVATO, Alessandro

Session Classification: WG2

Contribution ID: **69**

Type: **not specified**

Theory of neutrino pion production

Monday, August 13, 2018 3:00 PM (30 minutes)

Presenter: Dr GONZÁLEZ-JIMÉNEZ, Raúl

Session Classification: WG2

Contribution ID: 70

Type: **not specified**

Lattice QCD and neutrinos

Monday, August 13, 2018 3:30 PM (30 minutes)

Presenter: Dr KRONFELD, Andreas (Fermilab)

Session Classification: WG2

Contribution ID: 71

Type: **not specified**

NOvA Cross Section Results

Monday, August 13, 2018 4:30 PM (30 minutes)

Presenter: Dr JUDAH, Matt

Session Classification: WG2

Contribution ID: 72

Type: **not specified**

T2K Cross Section Results

Monday, August 13, 2018 5:00 PM (30 minutes)

Presenter: WRET, Clarence (University of Rochester)

Session Classification: WG2

Contribution ID: 73

Type: **not specified**

LArIAT Cross Section Results

Monday, August 13, 2018 5:30 PM (30 minutes)

Presenter: Dr TZANOV, Martin

Session Classification: WG2

Contribution ID: 74

Type: **not specified**

MINERvA Cross Section Results

Tuesday, August 14, 2018 2:00 PM (30 minutes)

Presenter: LU, Xianguo

Session Classification: WG1+WG2

Contribution ID: 75

Type: **not specified**

MicroBooNE Cross Section Results

Tuesday, August 14, 2018 2:30 PM (30 minutes)

Presenter: Dr JIANG, Libo (University of Pittsburgh)

Session Classification: WG1+WG2

Contribution ID: 76

Type: **not specified**

FNAL SBN Status

Tuesday, August 14, 2018 3:00 PM (30 minutes)

Presenter: Dr ZENNAMO, Joseph (Fermilab)

Session Classification: WG1+WG2

Contribution ID: 77

Type: **not specified**

Open Issues in Nuclear SIS and DIS Scattering

Thursday, August 16, 2018 2:00 PM (30 minutes)

Presenter: MORFIN, Jorge (Fermilab)

Session Classification: WG2

Contribution ID: 78

Type: **not specified**

Electron vs Muon Neutrinos

Thursday, August 16, 2018 2:30 PM (30 minutes)

Presenter: ANKOWSKI, Artur (Virginia Tech)

Session Classification: WG2

Contribution ID: 79

Type: **not specified**

Theory of electron scattering and neutrinos

Thursday, August 16, 2018 3:00 PM (30 minutes)

Presenter: Dr ROCCO, Noemi

Session Classification: WG2

Contribution ID: **80**

Type: **not specified**

Removal and Binding Energy in Lepton-Nucleus Scattering

Thursday, August 16, 2018 3:30 PM (30 minutes)

Presenter: Dr BODEK, Arie (University of Rochester)

Session Classification: WG2

Contribution ID: **81**

Type: **not specified**

Probing neutrino coupling to a light scalar with coherent neutrino scattering

Monday, August 13, 2018 2:00 PM (30 minutes)

Presenter: XU, Xun-Jie

Session Classification: WG5

Contribution ID: 82

Type: **not specified**

Average CsI neutron density distribution from COHERENT data

Monday, August 13, 2018 2:30 PM (30 minutes)

Presenter: CADEDDU, Matteo

Session Classification: WG5

Contribution ID: **83**

Type: **not specified**

A short travel for neutrinos in Large Extra Dimensions

Monday, August 13, 2018 3:30 PM (30 minutes)

Presenter: VITTI STENICO, Gabriela (UNICAMP)

Session Classification: WG5

Contribution ID: 84

Type: **not specified**

Coherent Elastic Neutrino Nucleus Scattering (CEvNS) as a probe of Z-prime through kinetic and mass mixing effects

Monday, August 13, 2018 3:00 PM (30 minutes)

Presenter: DENT, James

Session Classification: WG5

Contribution ID: 85

Type: **not specified**

Neutrino flavor transformation in supernova as a probe for nonstandard neutrino-scalar interactions

Monday, August 13, 2018 4:30 PM (30 minutes)

Presenter: KNELLER, Jim

Session Classification: WG5

Contribution ID: **86**

Type: **not specified**

Standard and non-standard neutrino physics at reactor experiments

Monday, August 13, 2018 5:00 PM (30 minutes)

Presenter: FORERO , David Vanegas

Session Classification: WG5

Contribution ID: 87

Type: **not specified**

Boosted Dark Matter at DUNE

Tuesday, August 14, 2018 2:00 PM (30 minutes)

Presenter: KIM, Doo Jin

Session Classification: WG5

Contribution ID: **88**

Type: **not specified**

Probing secret interactions of eV-scale sterile neutrinos with the diffuse supernova neutrino background

Tuesday, August 14, 2018 2:30 PM (30 minutes)

Presenter: RENO, Mary Hall

Session Classification: WG5

Contribution ID: **89**

Type: **not specified**

Neutrino Oscillations in Dark Backgrounds

Tuesday, August 14, 2018 3:00 PM (30 minutes)

Presenter: VECCHI, Luca

Session Classification: WG5

Contribution ID: **90**

Type: **not specified**

Light scalar dark matter at neutrino oscillation experiments

Tuesday, August 14, 2018 3:30 PM (30 minutes)

Presenter: WHISNANT, Kerry

Session Classification: WG5

Contribution ID: 91

Type: **not specified**

A reappraisal of constraints on Z-prime models from unitarity and direct searches at the LHC

Thursday, August 16, 2018 2:00 PM (30 minutes)

Presenter: BHANDOPDHAY, Triparno

Session Classification: WG5

Contribution ID: **92**

Type: **not specified**

Model independent non-unitarity

Thursday, August 16, 2018 2:30 PM (30 minutes)

Presenter: MINAKATA, Hisakazu

Session Classification: WG5

Contribution ID: 93

Type: **not specified**

Exploring the Potential of Short-Baseline Physics at Fermilab

Thursday, August 16, 2018 3:00 PM (30 minutes)

Presenter: PASQUINI, Pedro

Session Classification: WG5

Contribution ID: **94**

Type: **not specified**

Status of the ISODAR project

Thursday, August 16, 2018 3:30 PM (30 minutes)

Presenter: AXANI, Spencer

Session Classification: WG5

Contribution ID: 95

Type: **not specified**

Lepton-Number-Charged Scalars and Neutrino Beamstrahlung

Thursday, August 16, 2018 4:30 PM (30 minutes)

Presenter: KELLY, Kevin

Session Classification: WG5

Contribution ID: **96**

Type: **not specified**

Sterile neutrinos searches

Thursday, August 16, 2018 5:00 PM (30 minutes)

Presenter: HERNANDEZ-GARCIA, Josu

Session Classification: WG5

Contribution ID: 97

Type: **not specified**

Single Ion Barium Tagging for Neutrino-less Double-Beta Decay Searches. A multi-disciplinary technique in development for the NEXT experiment

Thursday, August 16, 2018 5:30 PM (30 minutes)

Presenter: PSIHAS, Fernanda

Session Classification: WG5

Contribution ID: **98**

Type: **not specified**

DUNE and CPT-violating Neutrinos

Friday, August 17, 2018 2:00 PM (30 minutes)

Presenter: TERNES, Christophe

Session Classification: WG5

Contribution ID: 99

Type: **not specified**

Future DUNE constraints on EFT

Friday, August 17, 2018 2:30 PM (30 minutes)

Presenter: DI CORTONA, Giovanni Grilli

Session Classification: WG5

Contribution ID: **100**

Type: **not specified**

Solar nu at DUNE and BSM

Friday, August 17, 2018 3:00 PM (30 minutes)

Presenter: LI, Shirley

Session Classification: WG5

Contribution ID: **101**

Type: **not specified**

Neutrino trident at DUNE

Friday, August 17, 2018 3:30 PM (30 minutes)

Presenter: HOSTERT, Matheus

Session Classification: WG5

Contribution ID: **102**

Type: **not specified**

WG4 Charge

Monday, August 13, 2018 2:00 PM (10 minutes)

Session Classification: WG4 -CLFV I

Contribution ID: **103**

Type: **not specified**

Status of the MEG II Experiment

Monday, August 13, 2018 2:10 PM (25 minutes)

Presenter: PAPA, Angela

Session Classification: WG4 -CLFV I

Contribution ID: **104**

Type: **not specified**

The search for Lepton-Flavour Violation with the Mu3e Experiment

Monday, August 13, 2018 2:35 PM (25 minutes)

Presenter: WAUTERS, Frederik (Johannes Gutenberg Universitaet Mainz)

Session Classification: WG4 -CLFV I

Contribution ID: **105**

Type: **not specified**

Status of the DeeMe Experiment

Monday, August 13, 2018 3:00 PM (25 minutes)

Presenter: NAGAO, Daiki (Osaka)

Session Classification: WG4 -CLFV I

Contribution ID: **106**

Type: **not specified**

Status of the COMET Experiment

Monday, August 13, 2018 3:25 PM (25 minutes)

Presenter: MORITSU, Manabu (KEK)

Session Classification: WG4 -CLFV I

Contribution ID: **107**

Type: **not specified**

The Mu2e Experiment at Fermilab

Monday, August 13, 2018 4:30 PM (25 minutes)

Presenter: BOI, Steve (Virginia)

Session Classification: WG4 - CLFV 2

Contribution ID: **108**

Type: **not specified**

Mu2e II - A Proposed Evolution of the Mu2e Experiment

Monday, August 13, 2018 4:55 PM (25 minutes)

Presenter: GROUP, Craig

Session Classification: WG4 - CLFV 2

Contribution ID: **109**

Type: **not specified**

Studies of PRISM/PRIME - the next generation muon to electron conversion experiment

Monday, August 13, 2018 5:20 PM (25 minutes)

Presenter: PASTERNAK, Jaroslaw (Imperial)

Session Classification: WG4 - CLFV 2

Contribution ID: **110**

Type: **not specified**

The g-2 experiment at Fermilab

Tuesday, August 14, 2018 2:00 PM (45 minutes)

Presenter: KASPAR, Jarek (Wisconsin)

Session Classification: WG4 - g-2, precision physics with muons

Contribution ID: **111**

Type: **not specified**

Standard Model prediction for the muon g-2

Tuesday, August 14, 2018 2:45 PM (25 minutes)

Presenter: NOMURA, Daisuke (KEK)

Session Classification: WG4 - g-2, precision physics with muons

Contribution ID: **112**

Type: **not specified**

Working Group Discussion Time

Tuesday, August 14, 2018 3:10 PM (50 minutes)

Session Classification: WG4 - g-2, precision physics with muons

Contribution ID: **113**

Type: **not specified**

Search for lepton favour violation with the ATLAS detector

Thursday, August 16, 2018 2:00 PM (25 minutes)

Presenter: CHAN, Wing Sheung (Nikhef)

Session Classification: WG4 - CLFV at Colliders

Contribution ID: **114**

Type: **not specified**

Status of Charged Lepton Flavor Violation searches at CMS and future prospects

Thursday, August 16, 2018 2:25 PM (25 minutes)

Presenter: BEGHIN, Diego (Univ. Libre de Bruxelles)

Session Classification: WG4 - CLFV at Colliders

Contribution ID: **115**

Type: **not specified**

Lepton Flavour Universal at LHCb

Thursday, August 16, 2018 2:50 PM (25 minutes)

Presenter: DORDEI, Francesca (CERN)

Session Classification: WG4 - CLFV at Colliders

Contribution ID: **116**

Type: **not specified**

BELLEII (TBC)

Session Classification: WG4 - CLFV at Colliders

Contribution ID: **117**

Type: **not specified**

Working Group Discussion Time

Thursday, August 16, 2018 3:15 PM (45 minutes)

Session Classification: WG4 - CLFV at Colliders

Contribution ID: **118**

Type: **not specified**

Test on lepton flavor universality at BESIII

Presenter: MA, Xinxin

Session Classification: WG4

Contribution ID: **119**

Type: **not specified**

Searches for Electric Dipole Moments (EDM) at a Storage Ring with JEDI

Friday, August 17, 2018 4:30 PM (25 minutes)

Presenter: ZUREK, Maria (Jülich Research Centre)

Session Classification: WG4

Contribution ID: **120**

Type: **not specified**

Distinguishing muon LFV effective couplings using $\mu^+e^- \rightarrow e^+e^-$

Friday, August 17, 2018 4:55 PM (25 minutes)

Presenter: SATO, Joe

Session Classification: WG4

Contribution ID: **121**

Type: **not specified**

Searches for heavy neutral lepton production and lepton flavour violation in kaon decays at the NA62 experiment

Friday, August 17, 2018 5:20 PM (25 minutes)

Presenter: Mr TRILOV, Stoyan

Session Classification: WG4

Contribution ID: **122**

Type: **not specified**

The MUon Scattering Experiment (MUSE) at the Paul Scherrer Institute

Thursday, August 16, 2018 4:30 PM (25 minutes)

Presenter: STRAUCH, Steffen (South Carolina)

Session Classification: WG4 - Muonic atoms/proton radius

Contribution ID: **123**

Type: **not specified**

Data Analysis and Preliminary Results of the Proton Charge Radius Experiment at JLab

Thursday, August 16, 2018 4:55 PM (25 minutes)

Presenter: GU, Chao (Duke)

Session Classification: WG4 - Muonic atoms/proton radius

Contribution ID: **124**

Type: **not specified**

Precision spectroscopy of exotic atoms involving muon

Thursday, August 16, 2018 5:20 PM (25 minutes)

Presenter: KANDA, Sohtaro (RIKEN)

Session Classification: WG4 - Muonic atoms/proton radius

Contribution ID: 125

Type: **not specified**

Towards a new High Intensity Muon Beam at PSI: Status and Prospects

Friday, August 17, 2018 2:00 PM (25 minutes)

Presenter: PAPA, Angela

Session Classification: WG3 and WG4 - Muon Beam Facilities

Contribution ID: 126

Type: **not specified**

Status of the Facility/Accelerator/Beam-line for Muon Programs at J-PARC

Friday, August 17, 2018 2:25 PM (25 minutes)

Presenter: NISHIGUCHI, Hajime (KEK)

Session Classification: WG3 and WG4 - Muon Beam Facilities

Contribution ID: **127**

Type: **not specified**

Cold muonium beam for atomics physics and gravity experiments

Friday, August 17, 2018 2:50 PM (25 minutes)

Presenter: SOTER, Anna (PSI)

Session Classification: WG3 and WG4 - Muon Beam Facilities

Contribution ID: **128**

Type: **not specified**

Commissioning and first results of the Fermilab Muon Campus

Friday, August 17, 2018 3:15 PM (25 minutes)

Presenter: STRATAKIS, Diktys (FNAL)

Session Classification: WG3 and WG4 - Muon Beam Facilities

Contribution ID: **129**

Type: **not specified**

WG4 and WG5 - Working Time

Friday, August 17, 2018 3:40 PM (20 minutes)

Session Classification: WG3 and WG4 - Muon Beam Facilities

Contribution ID: **130**

Type: **not specified**

CAPTAIN Results

Tuesday, August 14, 2018 3:30 PM (30 minutes)

Presenter: CHAVES, Jorge (University of Pennsylvania)

Session Classification: WG1+WG2

Contribution ID: **131**

Type: **not specified**

Electron scattering data and neutrinos

Thursday, August 16, 2018 4:30 PM (30 minutes)

Presenter: Dr WEINSTEIN, Larry

Session Classification: WG2

Contribution ID: **132**

Type: **not specified**

WAGASCI

Thursday, August 16, 2018 5:00 PM (30 minutes)

Presenter: Dr HALLSJO, Sven-Patrick

Session Classification: WG2

Contribution ID: **133**

Type: **not specified**

Low energy neutrino interactions

Thursday, August 16, 2018 5:30 PM (30 minutes)

Presenter: Dr HEDGES, Sam

Session Classification: WG2

Contribution ID: **134**

Type: **not specified**

NOvA Cross Section Model / Oscillation Needs

Friday, August 17, 2018 2:00 PM (30 minutes)

Presenter: Dr WOLCOTT, Jeremy (Tufts University)

Session Classification: WG2

Contribution ID: 135

Type: **not specified**

T2K Cross Section Model / Oscillation Needs

Friday, August 17, 2018 2:30 PM (30 minutes)

Presenter: WRET, Clarence (University of Rochester)

Session Classification: WG2

Contribution ID: **136**

Type: **not specified**

GENIE Physics Tuning

Friday, August 17, 2018 3:00 PM (30 minutes)

Presenter: Dr JIANG, Libo

Session Classification: WG2

Contribution ID: **137**

Type: **not specified**

Discussion

Friday, August 17, 2018 3:30 PM (30 minutes)

Session Classification: WG2

Contribution ID: 138

Type: **not specified**

Nucleon axial form-factor from a Bayesian neural network analysis of scattering data

Friday, August 17, 2018 4:30 PM (30 minutes)

Presenter: Dr SAUL SALA, Eduardo

Session Classification: WG2

Contribution ID: **139**

Type: **not specified**

NUISANCE for neutrino cross section fits

Friday, August 17, 2018 5:00 PM (30 minutes)

Presenter: Dr PICKERING, Luke

Session Classification: WG2

Contribution ID: **140**

Type: **not specified**

Discussion

Friday, August 17, 2018 5:30 PM (30 minutes)

Session Classification: WG2

Contribution ID: **141**

Type: **not specified**

Shedding light on low energy excess anomaly with MiniBooNE and MicroBooNE

Thursday, August 16, 2018 9:00 AM (30 minutes)

Presenter: PAVLOVIC, Zarko

Session Classification: Plenary VII

Contribution ID: 142

Type: **not specified**

Recent Progress on Radiation Damage Studies at RaDIATE

Monday, August 13, 2018 2:30 PM (30 minutes)

Presenter: ISHIDA, Taku (J-PARC/KEK)

Session Classification: WG3 Parallel Session 1

Contribution ID: **143**

Type: **not specified**

Future Upgrade of J-PARC Target and Beam Window

Monday, August 13, 2018 2:00 PM (30 minutes)

Presenter: DENSHAM, Chris (STFC)

Session Classification: WG3 Parallel Session 1

Contribution ID: 144

Type: **not specified**

Status and Physics Potential of MOMENT Study

Monday, August 13, 2018 3:00 PM (30 minutes)

Presenter: TANG, Jian (Sun Yat-Sen University, China)

Session Classification: WG3 Parallel Session 1

Contribution ID: 145

Type: **not specified**

ESSnuSB Target and Horn Studies and Future Development

Monday, August 13, 2018 3:30 PM (30 minutes)

Presenter: DRACOS, Marcos

Session Classification: WG3 Parallel Session 1

Contribution ID: 146

Type: **not specified**

Recent Results from MICE on Multiple Coulomb Scattering and Energy Loss

Monday, August 13, 2018 4:30 PM (30 minutes)

Presenter: NUGENT, John

Session Classification: WG3 Parallel Session 2

Contribution ID: **147**

Type: **not specified**

Recent Results from the Study of Emittance Evolution in MICE

Monday, August 13, 2018 5:00 PM (30 minutes)

Presenter: HUNT, Chris

Session Classification: WG3 Parallel Session 2

Contribution ID: **148**

Type: **not specified**

Measurement of Phase-Space Density Evolution in MICE

Monday, August 13, 2018 5:30 PM (30 minutes)

Presenter: TORUN, Yagmur

Session Classification: WG3 Parallel Session 2

Contribution ID: **149**

Type: **not specified**

The LBNF Beamline

Tuesday, August 14, 2018 2:00 PM (1 hour)

Presenter: BISHAI, Mary

Session Classification: WG3 Parallel Session 3

Contribution ID: **150**

Type: **not specified**

Upgrade Possibility of the ESS Linac for the ESSnuSB Project

Tuesday, August 14, 2018 3:00 PM (30 minutes)

Presenter: GÄLNANDER, Björn

Session Classification: WG3 Parallel Session 3

Contribution ID: **151**

Type: **not specified**

Discussion

Tuesday, August 14, 2018 3:30 PM (30 minutes)

Presenters: FREEMIRE, Ben (Northern Illinois University); SEKIGUCHI, Tetsuro

Session Classification: WG3 Parallel Session 3

Contribution ID: **152**

Type: **not specified**

Development and operational experience of T2K magnetic horn for over-MW beam

Thursday, August 16, 2018 2:00 PM (30 minutes)

Presenter: SEKIGUCHI, Tetsuro

Session Classification: WG3 Parallel Session 4

Contribution ID: **153**

Type: **not specified**

Design and Challenges of ESSnusB Accumulator

Thursday, August 16, 2018 2:30 PM (30 minutes)

Presenter: ZOU, Ye

Session Classification: WG3 Parallel Session 4

Contribution ID: 154

Type: **not specified**

Integrable Optics Test Accelerator

Thursday, August 16, 2018 3:00 PM (30 minutes)

Presenter: FREEMIRE, Ben (Northern Illinois University)

Session Classification: WG3 Parallel Session 4

Contribution ID: **155**

Type: **not specified**

The g-2 Beamline

Friday, August 17, 2018 4:30 PM (30 minutes)

Presenter: FROEMMING, Nathan (NIU/Fermilab)

Session Classification: WG3 Parallel Session 7

Contribution ID: **156**

Type: **not specified**

IsoDAR

Friday, August 17, 2018 5:00 PM (30 minutes)

Presenter: SMOLSKY, Joseph

Session Classification: WG3 Parallel Session 7

Contribution ID: **157**

Type: **not specified**

Discussion

Friday, August 17, 2018 5:30 PM (30 minutes)

Presenters: FREEMIRE, Ben (Northern Illinois University); SEKIGUCHI, Tetsuro

Session Classification: WG3 Parallel Session 7

Contribution ID: **158**

Type: **not specified**

EMuS at CSNS Updated Studies

Thursday, August 16, 2018 4:30 PM (30 minutes)

Presenter: VASSILOPOULOS, Nikos

Session Classification: WG3 Parallel Session 5

Contribution ID: **159**

Type: **not specified**

Status of NA61/SHINE Measurements for Neutrino Experiments

Thursday, August 16, 2018 5:00 PM (30 minutes)

Presenter: WICKREMASINGHE, Athula

Session Classification: WG3 Parallel Session 5

Contribution ID: **160**

Type: **not specified**

Status of the ENUBET

Thursday, August 16, 2018 5:30 PM (30 minutes)

Presenters: BRUNETTI, Giulia; BRUNETTI, Giulia

Session Classification: WG3 Parallel Session 5

Contribution ID: **161**Type: **not specified**

Neutrino Physics with Deep Learning on NOvA

The NOvA experiment has made both ν_μ disappearance and ν_e appearance measurements in Fermilab's NuMI beam, and is working on cross section measurements using near detector data. At the core of NOvA's measurements is the use of deep learning algorithms for identification and reconstruction of the neutrino flavor and energy.

Presented here is the extension of our deep learning efforts for identification of neutrino signal events, final state identification, single particle tagging, and reconstruction using instance segmentation techniques. I will describe the new implementations of modified Convolutional Neural Networks for anti-neutrino events which yield a 14% improvement in efficiency. I will also show the performance of our single particle ID network, data driven performance tests, standard candle measurements, and advances for reconstruction.

Primary author: PSIHAS, Fernanda

Presenter: PSIHAS, Fernanda

Session Classification: Posters & welcome reception

Contribution ID: **162**

Type: **not specified**

Low Emittance Muon Beams

Thursday, August 16, 2018 3:30 PM (30 minutes)

Presenter: BOSCOLO, Manuela

Session Classification: WG3 Parallel Session 4

Contribution ID: **169**

Type: **not specified**

Atmospheric neutrino results from Super-Kamiokande

Presenter: Dr BRONNER, Christophe (ICRR)

Session Classification: WG1

Contribution ID: **170**

Type: **not specified**

Atmospheric Neutrino Oscillations with IceCube/DeepCore

Presenter: Prof. COWAN, Doug (Penn State)

Session Classification: WG1

Contribution ID: 171

Type: **not specified**

Neutrino physics with KM3NeT/ORCA

Presenter: Dr ZABOROV, Dmitry (CPPM)

Session Classification: WG1

Contribution ID: 172

Type: **not specified**

Final results from the OPERA experiment in the CNGS neutrino beam

Presenter: TENTI, Matteo (INFN)

Session Classification: WG1

Contribution ID: **173**

Type: **not specified**

Double Chooz

Session Classification: WG1 Neutrino oscillation

Contribution ID: **174**

Type: **not specified**

New Results from RENO

Monday, August 13, 2018 2:00 PM (30 minutes)

Presenter: Dr JANG, JeeSeung (GIST)

Session Classification: WG1 Neutrino oscillation

Contribution ID: 175

Type: **not specified**

Latest Results from the Daya Bay Reactor Neutrino Experiment

Monday, August 13, 2018 2:30 PM (30 minutes)

Presenter: Dr WENQIANG, Gu (Brookhaven National Laboratory)

Session Classification: WG1 Neutrino oscillation

Contribution ID: 176

Type: **not specified**

Probing Neutrino Mass Ordering and Solar neutrinos with JUNO detector

Monday, August 13, 2018 3:00 PM (30 minutes)

Presenter: DING, Xuefeng (Gran Sasso Science Insitute)

Session Classification: WG1 Neutrino oscillation

Contribution ID: 177

Type: **not specified**

The design and research progresses of the Central Detector in JUNO

Monday, August 13, 2018 3:30 PM (30 minutes)

Presenter: Prof. HENG, Yuekun (IHEP)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **178**

Type: **not specified**

Atmospheric neutrino results from Super-Kamiokande

Monday, August 13, 2018 4:30 PM (23 minutes)

Presenter: Dr BRONNER, Christophe (ICRR)

Session Classification: WG1 Neutrino oscillation

Contribution ID: 179

Type: **not specified**

Atmospheric Neutrino Oscillations with IceCube/DeepCore

Monday, August 13, 2018 4:53 PM (23 minutes)

Presenter: Prof. COWEN, Doug (Penn State)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **180**

Type: **not specified**

Neutrino physics with KM3NeT/ORCA

Monday, August 13, 2018 5:16 PM (23 minutes)

Presenter: Dr ZABOROV, Dmitry (CPPM)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **181**

Type: **not specified**

Final results from the OPERA experiment in the CNGS neutrino beam

Monday, August 13, 2018 5:39 PM (23 minutes)

Presenter: TENTI, Matteo (INFN)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **182**

Type: **not specified**

Details of the NOvA oscillation analyses

Thursday, August 16, 2018 2:00 PM (30 minutes)

Presenter: Dr SMITH, Erica (Indiana University)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **183**

Type: **not specified**

Details of the T2K oscillation analyses

Thursday, August 16, 2018 2:30 PM (30 minutes)

Presenter: SGALABERNA, Davide (CERN)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **184**

Type: **not specified**

Global analysis of neutrino oscillation experiments

Thursday, August 16, 2018 3:00 PM (30 minutes)

Presenter: TERNES, Christophe

Session Classification: WG1 Neutrino oscillation

Contribution ID: **185**

Type: **not specified**

MicroBooNE Search for Low-Energy Excess Using Deep Learning Algorithms

Thursday, August 16, 2018 3:30 PM (30 minutes)

Presenter: YATES, Lauren (MIT)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **186**

Type: **not specified**

DUNE Oscillation Physics

Thursday, August 16, 2018 4:30 PM (23 minutes)

Presenter: Dr CHATTERJEE, Animesh (University of Texas at Arlington)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **187**

Type: **not specified**

Physics potential of Hyper-Kamiokande for neutrino oscillation measurements

Thursday, August 16, 2018 4:53 PM (23 minutes)

Presenter: Dr SEKIGUCHI , Tetsuro (KEK)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **188**

Type: **not specified**

Physics potential of the ESSvSB facility

Thursday, August 16, 2018 5:16 PM (23 minutes)

Presenter: ROSAURO ALCARAZ, Salvador (Universidad Autónoma de Madrid)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **189**

Type: **not specified**

Status of ProtoDUNE Experiments at CERN

Thursday, August 16, 2018 5:39 PM (23 minutes)

Presenter: Dr WANG, Jingbo (UC Davis)

Session Classification: WG1 Neutrino oscillation

Contribution ID: **190**

Type: **not specified**

Sterile Neutrinos search via NC dis at NOvA

Friday, August 17, 2018 4:53 PM (23 minutes)

Presenter: Dr WALLBANK, Michael (University of Cincinnati)

Session Classification: WG1+WG5

Contribution ID: **191**

Type: **not specified**

Latest Results from MINOS+ on Sterile Neutrinos search

Friday, August 17, 2018 5:16 PM (23 minutes)

Presenter: TODD, Jacob (University of Cincinnati)

Session Classification: WG1+WG5

Contribution ID: **192**

Type: **not specified**

Sterile neutrino searches with the ICARUS detector

Friday, August 17, 2018 4:30 PM (23 minutes)

Presenter: Dr TSAI, Yun-Tse (SLAC)

Session Classification: WG1+WG5

Contribution ID: **193**

Type: **not specified**

First Results from the PROSPECT Short Baseline Reactor Experiment

Friday, August 17, 2018 5:39 PM (23 minutes)

Presenter: BOWDEN, Nathaniel (LLNL)

Session Classification: WG1+WG5

Contribution ID: **194**

Type: **not specified**

Measuring the Leptonic Dirac CP Phase with Muon Decay at Rest

Monday, August 13, 2018 5:30 PM (30 minutes)

Presenter: GE, Shao-Feng (Kavli IPMU (WPI), UTIAS, The University of Tokyo, Japan Department of Physics, University of California, Berkeley, USA)

Session Classification: WG5

Contribution ID: **195**

Type: **not specified**

Welcome and introduction

Sunday, August 12, 2018 10:30 AM (15 minutes)

Presenter: HUBER, Patrick

Session Classification: Session 1

Contribution ID: **196**

Type: **not specified**

Sketch of physics case in preparation for the EU Strategy Update

Sunday, August 12, 2018 10:45 AM (15 minutes)

Presenter: LONG, Ken (Imperial College London)

Session Classification: Session 1

Contribution ID: **197**

Type: **not specified**

Cross section issues for the next decade

Sunday, August 12, 2018 11:00 AM (30 minutes)

Presenter: MORFIN, Jorge (Fermilab)

Session Classification: Session 1

Contribution ID: **198**

Type: **not specified**

Detector concepts for nuSTORM

Sunday, August 12, 2018 11:30 AM (30 minutes)

Presenter: SOLER, Paul

Session Classification: Session 1

Contribution ID: **199**

Type: **not specified**

Status of consideration of implementation of nuSTORM at CERN

Sunday, August 12, 2018 12:00 PM (30 minutes)

Presenter: LAMONT, Mike (CERN)

Session Classification: Session 1

Contribution ID: **200**

Type: **not specified**

nuSTORM accelerator concept to serve cross-section programme

Sunday, August 12, 2018 2:00 PM (25 minutes)

Presenters: PASTERNAK, Jaroslaw; APPLEBY, Rob (Manchester); TYGIER, Sam (Manchester)

Session Classification: Session 2

Contribution ID: **201**

Type: **not specified**

Simulation studies of a detector for nuSTORM

Sunday, August 12, 2018 2:25 PM (25 minutes)

Presenter: Dr HALLSJO, Sven-Patrick

Session Classification: Session 2

Contribution ID: **202**

Type: **not specified**

Discussion: (re)forming a nuSTORM collaboration

Sunday, August 12, 2018 2:50 PM (40 minutes)

Session Classification: Session 2

Contribution ID: 203

Type: **not specified**

Daya Bay Reactor Neutrino Experiment

Starting in 2011, the Daya Bay Reactor Neutrino Experiment observed anti-neutrinos from six nuclear reactors with eight identically designed underground anti-neutrino detectors in three experimental halls, and has accumulated the world's largest dataset of anti-neutrino candidates. The measurement of the neutrino mixing angle θ_{13} and the neutrino mass squared difference $|\Delta m^2_{ee}|$ have reached a precision of better than 4%. The large dataset allows study of a variety of topics in neutrino physics, such as absolute reactor flux and spectrum. In this poster, we will present the latest results from Daya Bay on several topics.

Primary author: LI, Shengchao

Presenter: LI, Shengchao

Session Classification: Posters & welcome reception

Contribution ID: 204

Type: **not specified**

ANNIE Phase II Detector and Event Reconstruction

The Accelerator Neutrino Neutron Interaction Experiment (ANNIE), deployed on the Booster Neutrino Beam (BNB) at Fermilab, has recently finished the neutron background measurement in the Phase I data taking. The primary physics goal of Phase II is to measure the multiplicity of final state neutrons from neutrino-nucleus interactions in water, which provides a strong handle to study the systematic uncertainties relevant to the neutrino energy reconstruction in the future long baseline oscillation experiments. The ANNIE Phase II detector will use Gadolinium-loaded water to detect the final state neutrons from neutrino interactions. It will also incorporate five Large Area Picosecond PhotoDetectors (LAPPDs) to improve the vertex and track reconstruction capability required by the physics goals. This presentation will give an overview of the Phase II detector upgrade and focus on the event reconstruction capability improved by the LAPPDs.

Primary author: WANG, Jingbo**Presenter:** WANG, Jingbo**Session Classification:** Posters & welcome reception

Contribution ID: **205**Type: **not specified**

The NOvA Test Beam Program

NOvA is a long-baseline off-axis beam neutrino experiment. By measuring ν_μ disappearance and ν_e appearance at the 14 kiloton NOvA Far Detector, the experiment is addressing outstanding questions in neutrino physics, including the neutrino mass hierarchy and existence of leptonic CP violation. The NOvA Test Beam program, under deployment at the Fermilab Test Beam Facility, will use a scaled-down NOvA detector to sample beams of tagged electrons, muons, pions, and protons in the momentum range of 0.3 to 2 GeV/c. It will further the NOvA physics reach by precisely measuring the detector's muon energy scale and electromagnetic and hadronic response, and provide real data for detailed studies of particle identification techniques. Ongoing efforts on beamline instrumentation, data acquisition, simulation, momentum reconstruction and particle identification are presented. Implications for the neutrino oscillation measurements are discussed.

Primary author: SUTTON, Andrew

Presenter: SUTTON, Andrew

Session Classification: Posters & welcome reception

Contribution ID: 206

Type: **not specified**

Neutrino Physics with Deep Learning on NOvA

The NOvA experiment has made both ν_μ disappearance and ν_e appearance measurements in Fermilab's NuMI beam, and is working on cross section measurements using near detector data. At the core of NOvA's measurements is the use of deep learning algorithms for identification and reconstruction of the neutrino flavor and energy.

Presented here is the extension of our deep learning efforts for identification of neutrino signal events, final state identification, single particle tagging, and reconstruction using instance segmentation techniques. I will describe the new implementations of modified Convolutional Neural Networks for anti-neutrino events which yield a 14% improvement in efficiency. I will also show the performance of our single particle ID network, data driven performance tests, standard candle measurements, and advances for reconstruction.

Primary author: PSIHAS, Fernanda

Presenter: PSIHAS, Fernanda

Session Classification: Posters & welcome reception

Contribution ID: 207

Type: **not specified**

Reactor Antineutrino Detection Using CHANDLER : A New Portable Neutrino Detector Tulasi Subedi Abstract CHANDLER

CHANDLER is a neutrino detection technology to detect reactor antineutrino. It detects the end products (positron and neutron) from inverse beta decay (IBD) reaction, to tag an event. This technology can be used for nuclear non-proliferation and a sterile neutrino search.

Primary author: SUBEDI, Tulasi

Presenter: SUBEDI, Tulasi

Session Classification: Posters & welcome reception

Contribution ID: **208**

Type: **not specified**

Close

Saturday, August 18, 2018 12:45 PM (5 minutes)

Presenter: HUBER, Patrick

Session Classification: Plenary Summary II and Closeout