California EIC Consortium Collaboration Meeting

Monday 18 July 2022 - Tuesday 19 July 2022

Physics Building

Book of Abstracts

Contents

Investigation of Vector Meson Backward-Production Capabilities at the EIC 1

Welcome 1

EIC Project Overview 1

Detector 1 Physics and Pverview 1

A new era for small-x physics 1

Investigation of Vector Meson Backward-Production Capabilities at the EIC 1

UC Davis Overview 1

UCB Overview 2

LBNL Overview 2

LLNL Overivew 2

UCLA Overview 2

UCR Overview 2

LANL Overview 2

Cal Poly SLO Overview 2

Performance of a proposed high-granularity calorimeter insert for the EIC 2

”Flash Talk” Light yield measurement of SiPM-on-tile with cosmic rays 2

Probing nucleon spin structure with inclusive DIS 3

Unveiling Nucleon 3D Chiral-Odd Structure with Jet Axes 3

QED radiative effects at the EIC 3

Geant4 Simulations of High-Granularity HCAL Insert 3

”Flash Talk” Laboratory Set Up and the Modify of Sipm Waveform Collections 3

”Flash Talk” Studies of scintillators with wavelength-shifting fiber readout 3

Forward Charm Production 3

J/psi Production in e+p in the ICEM . . . 3
D0 double ratio measurement at the EIC . . . 4
Track finding at the EIC . . . 4
MC studies to optimize pixel tracker . . . 4
Jet Physics at the EIC . . . 4
”Flash Talk” Simulations of jets and jet charge at the EIC . . . 4
Benefits of Machine Learning in DIS reconstruction and unfolding . . . 4
Conformal Colliders Meet the LHC (and the EIC) . . . 4
EIC Detector-1 pECal performance study . . . 4
The Gluon Sivers Asymmetry in Dijet Production at the EIC . . . 4
Electron showers in calorimeter insert . . . 5
SiPM-on-tile uniformity and cross-talk measurements . . . 5

2

Investigation of Vector Meson Backward-Production Capabilities at the EIC

Author: Zachary Sweger[1]

[1] *University of California, Davis*

Backward (u-channel) production of vector mesons in ep collisions is characterized by a final state consisting of a nearly-stopped proton and a vector meson with a large forward momentum. In conventional (forward, t-channel) production, the momentum transfer from the proton to the meson is small and is modeled by pomeron-exchange trajectories. The less well-understood u-channel production is modeled by a baryon-exchange trajectory and can provide unique insight into the nucleon wave function and inform contributions to baryon stopping in heavy-ion collisions. The Electron-Ion Collider presents the nuclear physics community with an opportunity to measure u-channel production at higher center-of-mass energies than previously available. Measurements of backward-production events require far-forward detectors for observing high-rapidity mesons. eSTARlight, a code for modeling vector-meson production, is used to simulate backward-production events at the EIC. Several production channels will be analyzed at the known EIC collision energies, and detection capabilities for proposed detector designs will be assessed.

9

Welcome

12

EIC Project Overview

13

Detector 1 Physics and Pverview

14

A new era for small-x physics

15

Investigation of Vector Meson Backward-Production Capabilities at the EIC

16

UC Davis Overview

17

UCB Overview

18

LBNL Overview

19

LLNL Overivew

20

UCLA Overview

21

UCR Overview

22

LANL Overview

23

Cal Poly SLO Overview

24

Performance of a proposed high-granularity calorimeter insert for the EIC

25

”Flash Talk” Light yield measurement of SiPM-on-tile with cosmic rays

26

Probing nucleon spin structure with inclusive DIS

27

Unveiling Nucleon 3D Chiral-Odd Structure with Jet Axes

28

QED radiative effects at the EIC

29

Geant4 Simulations of High-Granularity HCAL Insert

30

”Flash Talk” Laboratory Set Up and the Modify of Sipm Waveform Collections

31

”Flash Talk” Studies of scintillators with wavelength-shifting fiber readout

32

Forward Charm Production

33

J/psi Production in e+p in the ICEM

34

D0 double ratio measurement at the EIC

35

Track finding at the EIC

36

MC studies to optimize pixel tracker

40

Jet Physics at the EIC

41

”Flash Talk” Simulations of jets and jet charge at the EIC

42

Benefits of Machine Learning in DIS reconstruction and unfolding

43

Conformal Colliders Meet the LHC (and the EIC)

44

EIC Detector-1 pECal performance study

45

The Gluon Sivers Asymmetry in Dijet Production at the EIC

46

Electron showers in calorimeter insert

47

SiPM-on-tile uniformity and cross-talk measurements