

4D Tracking workshop



Report of Contributions

Contribution ID: 1

Type: **not specified**

Introduction

Thursday, 7 November 2024 08:00 (15 minutes)

Workshop charge:

The central question driving this workshop is: What are the best technologies for developing a 4D tracker over the next 10 years, and how can we effectively integrate them? While this question cannot be definitively answered today, it is clear that significant generic R&D is required. This R&D should progress from proof-of-principle demonstrations of individual components to the development of a 4D tracking system demonstrator—something capable of performing 4D tracking in a test beam environment.

The goal of this workshop is to formulate concrete proposals for a U.S. program that enables steady progress towards such a demonstrator. A key initial step will be defining the necessary requirements and specifications. This doesn't mean that individual technologies (such as sensors) need to be selected and fixed at this stage. However, a hybrid approach could be outlined, where different sensors can be integrated with a common readout chip, allowing flexibility as the technologies evolve.

As future applications like HL-LHC Phase 3, MUC, FCC-ee/ILC, and FCC-hh continue to take shape, we aim to identify specific challenges these applications will demand. By focusing on challenges that are achievable with current technology, we can explore options that will guide the development of future detector systems before moving into application-specific R&D.

The workshop will conclude with a short report summarizing the key findings and recommendations related to these charge questions.

Contribution ID: 2

Type: **not specified**

FCC-ee electronics challenges and requirements

Thursday, 7 November 2024 13:15 (15 minutes)

Presenter: PARAMONOV, Alexander (Argonne National Laboratory)

Session Classification: Electronics

Contribution ID: 3

Type: **not specified**

HL-LHC & Muon collider electronics challenges and requirements

Thursday, 7 November 2024 13:30 (25 minutes)

Presenter: HEIM, Timon (Lawrence Berkeley National Lab (LBNL))

Session Classification: Electronics

Contribution ID: 4

Type: **not specified**

Showcase of current developments:

Thursday, 7 November 2024 13:55 (5 minutes)

Session Classification: Electronics

Contribution ID: 5

Type: **not specified**

---SLAC National Accelerator Laboratory

Thursday, 7 November 2024 14:00 (10 minutes)

Presenter: MARKOVIC, Bojan (SLAC)

Session Classification: Electronics

Contribution ID: 6

Type: **not specified**

---Lawrence Berkeley National Laboratory

Thursday, 7 November 2024 14:10 (10 minutes)

Presenter: HEIM, Timon (Lawrence Berkeley National Lab (LBNL))

Session Classification: Electronics

Contribution ID: 7

Type: **not specified**

---Fermi National Accelerator Laboratory

Thursday, 7 November 2024 14:20 (10 minutes)

Presenter: BRAGA, Davide (Fermilab)

Session Classification: Electronics

Contribution ID: 8

Type: **not specified**

---Argonne National Laboratory

Thursday, 7 November 2024 14:30 (10 minutes)

Presenter: PARAMONOV, Alexander (Argonne National Laboratory)

Session Classification: Electronics

Contribution ID: 9

Type: **not specified**

Discussion / Demonstrator proposal

Thursday, 7 November 2024 14:40 (50 minutes)

Session Classification: Electronics

Contribution ID: **10**

Type: **not specified**

LGADs

Thursday, 7 November 2024 09:45 (15 minutes)

Presenter: APRESYAN, Artur

Session Classification: Sensors

Contribution ID: 11

Type: **not specified**

3D sensors

Thursday, 7 November 2024 10:00 (15 minutes)

Presenters: KOK, Angela; Dr KOK, Angela (SLAC)

Session Classification: Sensors

Contribution ID: 12

Type: **not specified**

Thin Films

Thursday, 7 November 2024 11:25 (10 minutes)

Presenter: OTT, Jennifer (University of California, Santa Cruz (US))

Session Classification: Sensors

Contribution ID: 13

Type: **not specified**

Diamonds

Thursday, 7 November 2024 10:55 (10 minutes)

Presenter: Prof. SCHUMM, Bruce (Santa Cruz Institute for Particle Physics and the University of California, Santa Cruz (US))

Session Classification: Sensors

Contribution ID: 14

Type: **not specified**

Wide band gap materials

Thursday, 7 November 2024 11:05 (10 minutes)

Presenter: HABER, Carl (LBNL)

Session Classification: Sensors

Contribution ID: 15

Type: **not specified**

3D integration

Thursday, 7 November 2024 11:15 (10 minutes)

Presenter: SEGAL, Julie (SLAC)

Session Classification: Sensors

Contribution ID: **16**

Type: **not specified**

MAPS

Thursday, 7 November 2024 10:15 (15 minutes)

Presenter: PAOLOZZI, Lorenzo

Session Classification: Sensors

Contribution ID: 17

Type: **not specified**

Discussion

Thursday, 7 November 2024 11:35 (55 minutes)

Presenters: HABER, Carl (LBNL); MAZZA, Simone

Session Classification: Sensors

Contribution ID: 18

Type: **not specified**

Motivation, Environment and Challenges of Precision Timing in Future Colliders

Thursday, 7 November 2024 08:15 (25 minutes)

Session Classification: Simulation, reconstruction, and applications

Contribution ID: 19

Type: **not specified**

Technical Tools for Future Collider Studies

Thursday, 7 November 2024 09:05 (20 minutes)

Session Classification: Simulation, reconstruction, and applications

Contribution ID: **20**

Type: **not specified**

---**Brookhaven National Laboratory**

Session Classification: Electronics