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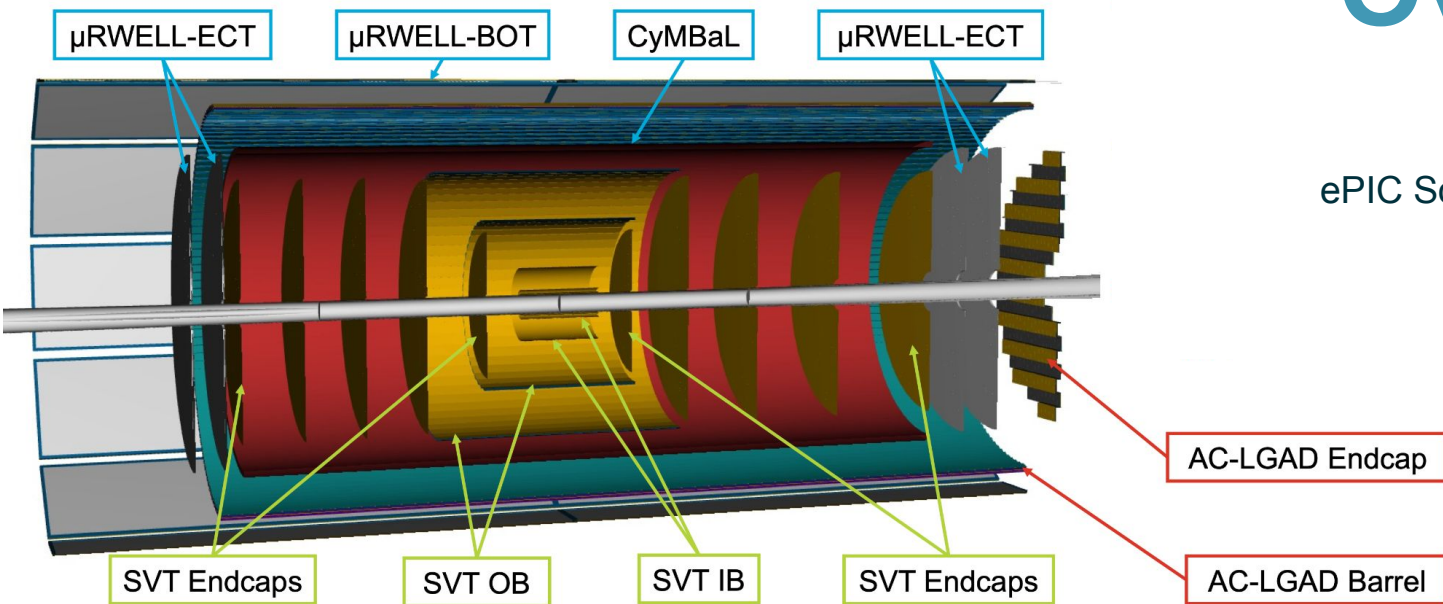
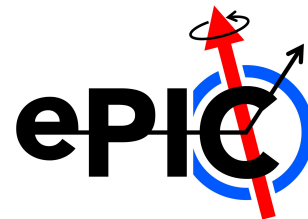
Office of Science

# ePIC/ACTS

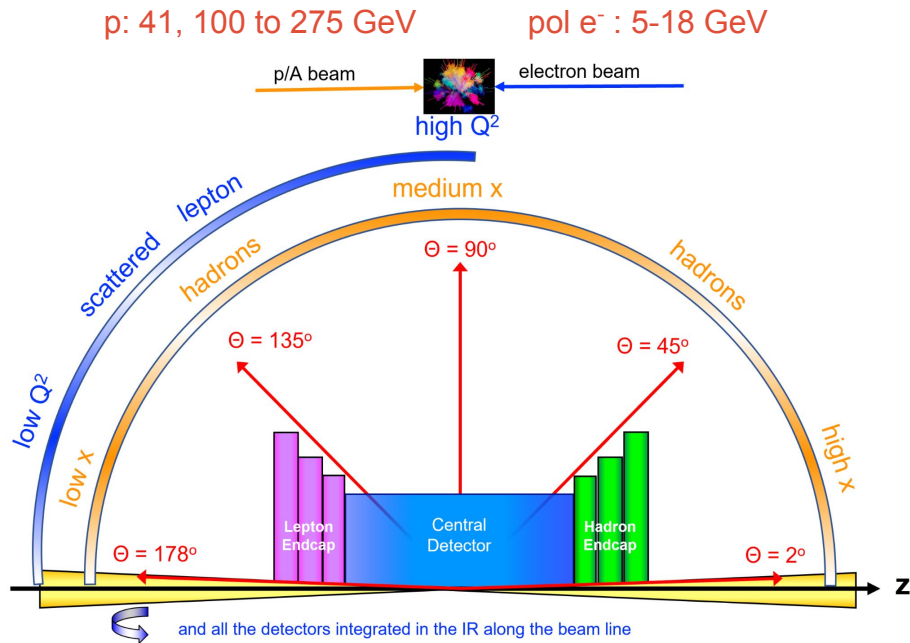
## Overview

Shujie Li

ePIC Software and Computing  
Meeting @ CERN  
April 23, 2024



# ePIC at EIC



far-forward/backward systems are not shown

- Luminosity:  $10^{33} - 10^{34} \text{ cm}^{-2}\text{s}^{-1}$
- Center-of-mass energy: 28 - 140 GeV
- Crossing angle: 25 mrad
- Central detector coverage:  $-4 < \eta < 4$
- Multiplicity  $< 10$

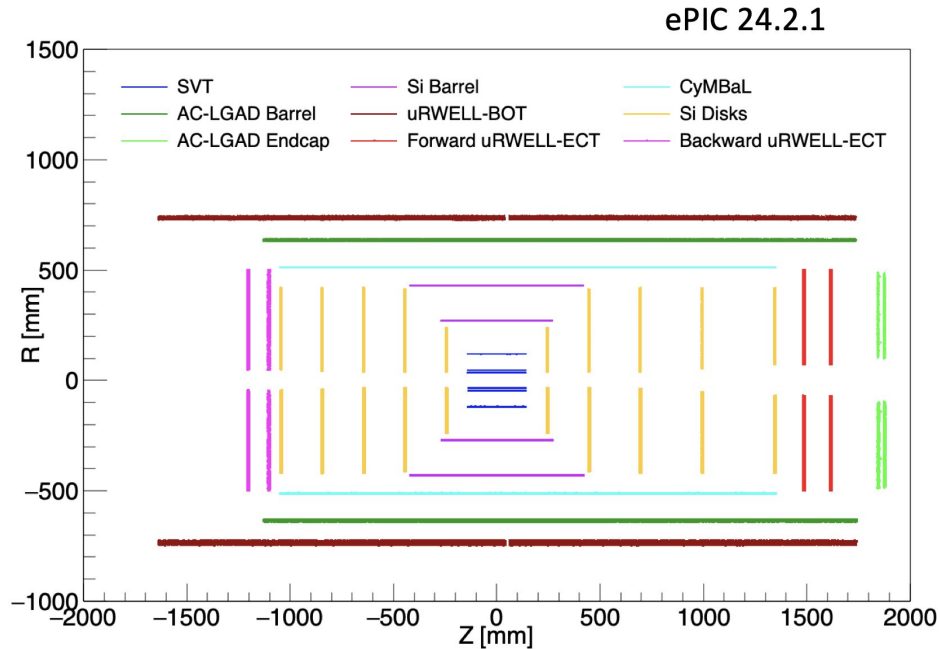
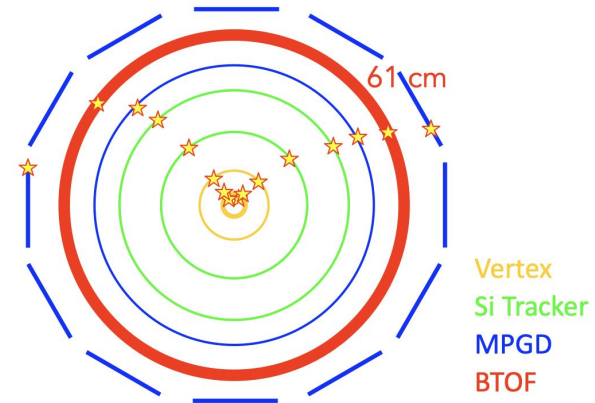
Resolution requirements (for  $p_T < 15 \text{ GeV}$ )

	Momentum Resolution	Spatial Resolution
Backward (-3.5 to -2.5)	$\sim 0.10\% \times p \oplus 2.0\%$	$\sim 30/p_T \mu\text{m} \oplus 40 \mu\text{m}$
Backward (-2.5 to -1.0)	$\sim 0.05\% \times p \oplus 1.0\%$	$\sim 30/p_T \mu\text{m} \oplus 20 \mu\text{m}$
Barrel (-1.0 to 1.0)	$\sim 0.05\% \times p \oplus 0.5\%$	$\sim 20/p_T \mu\text{m} \oplus 5 \mu\text{m}$
Forward (1.0 to 2.5)	$\sim 0.05\% \times p \oplus 1.0\%$	$\sim 30/p_T \mu\text{m} \oplus 20 \mu\text{m}$
Forward (2.5 to 3.5)	$\sim 0.10\% \times p \oplus 2.0\%$	$\sim 30/p_T \mu\text{m} \oplus 40 \mu\text{m}$

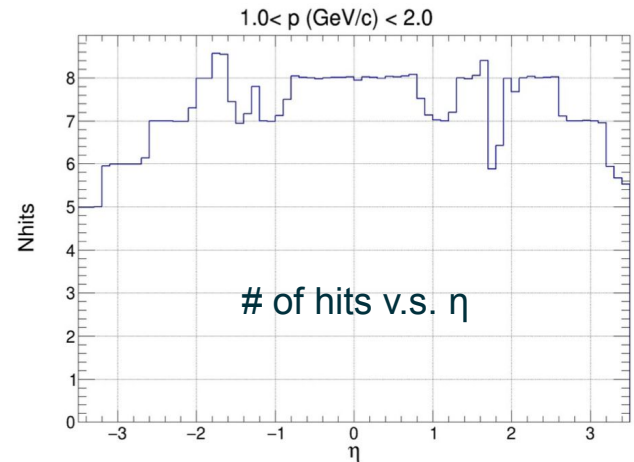
# ePIC Tracking Configuration

**Barrels:** 3 x ITS3 vertex layers + 2 x Silicon barrel + 2 x MPGD + 1 x AC-LGAD

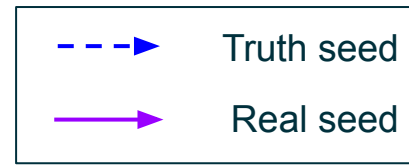
**Endcaps:** 5 x Silicon disks + 2 x MPGD disks + 1 forward AC-LGAD disk



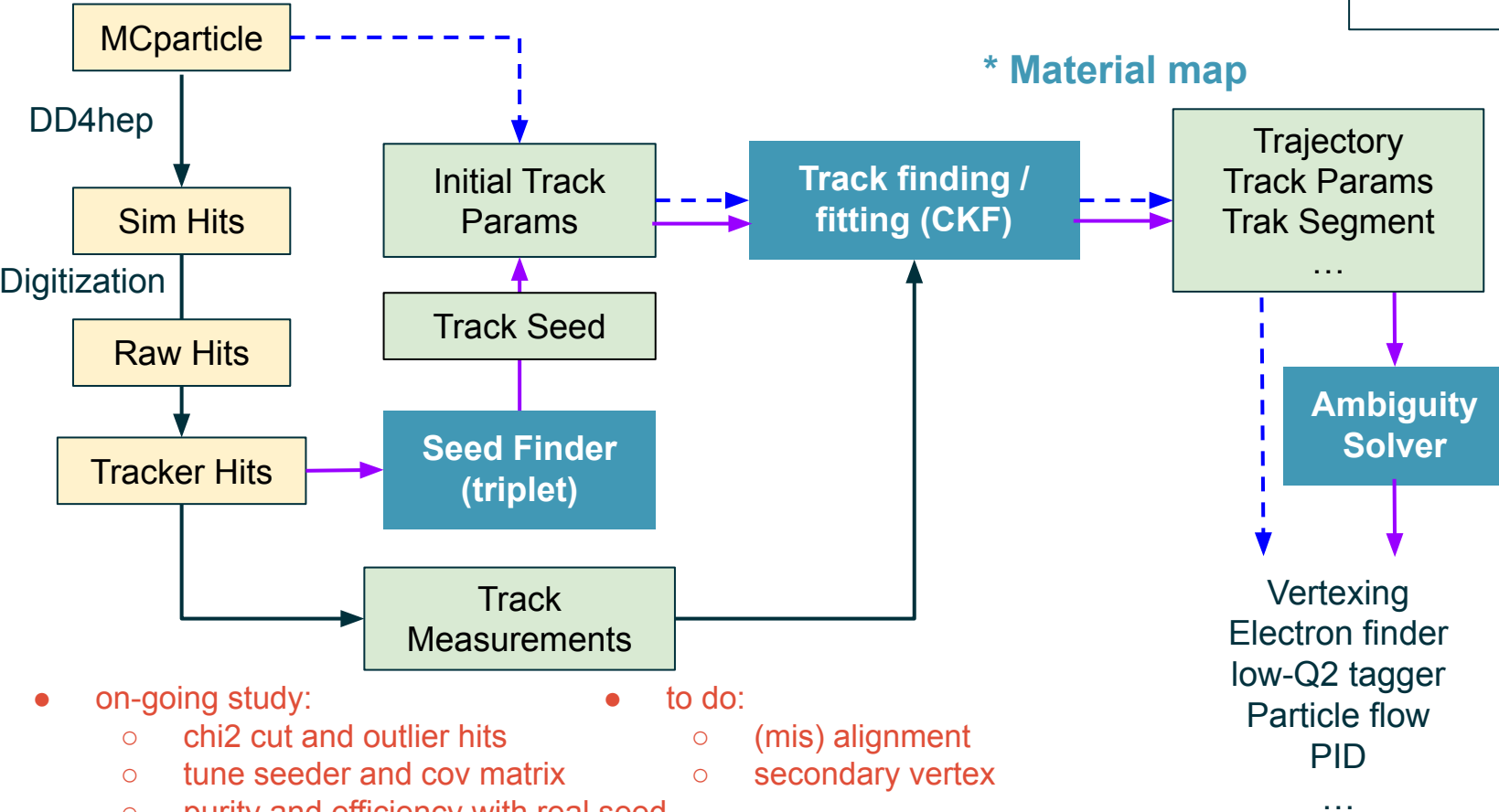
\*support and service structures not showing



# Track Reconstruction Workflow with ACTS



\* Material map



- on-going study:
  - chi2 cut and outlier hits
  - tune seeder and cov matrix
  - purity and efficiency with real seed

- to do:
  - (mis) alignment
  - secondary vertex