



Tracking Workshop Closing

Xiaocong Ai (ZZU)

2nd Tracking Workshop in Particle Physics Experiments, Huizhou, July 21-23, 2025

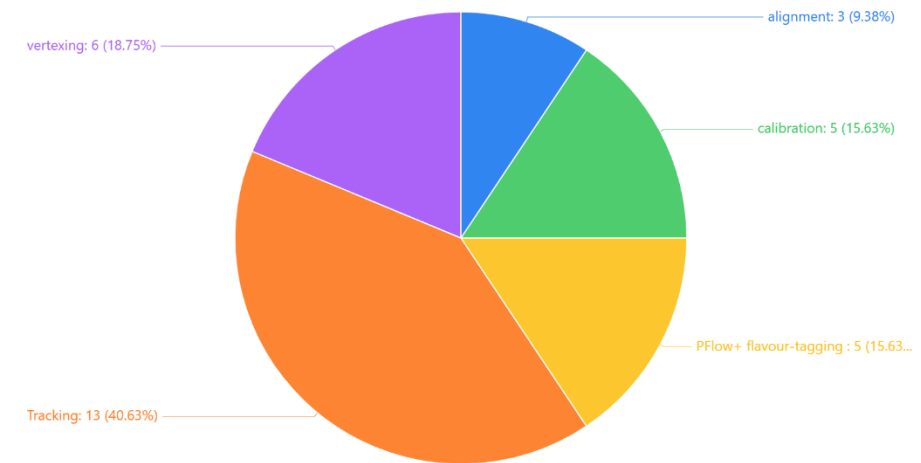
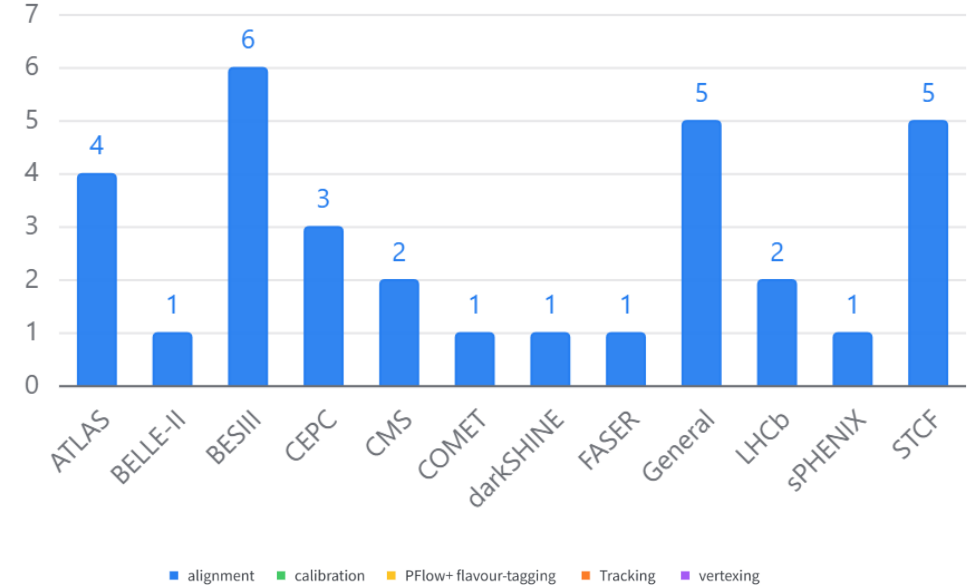
People

- ~70 participants (11 online) from 18 institutes (13 domestic + 5 international)



Talks

- 2 days, 8 sessions, 31 talks
 - Hybrid (onsite + remote, Chinese + English)
- Experiments:
 - BESIII, ATLAS, CMS, LHCb, sPHENIX, FASER, BELLE-II
 - CEPC, STCF, COMET, darkSHINE
- What's about:
 - **Core tracking** (13), **vertexing** (6), **PFlow+ flavour-tagging** (5), **calibration** (5), **alignment** (3)
- Emerging new methodology:
 - **ACTS** (8), **4D tracking** (4), **AI** (11), **Quantum Computing** (2), **GPU/FPGA tracking** (4)

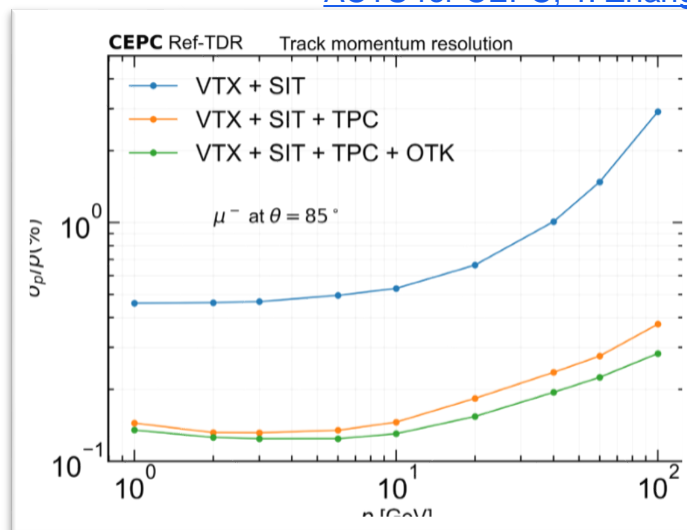


Core tracking

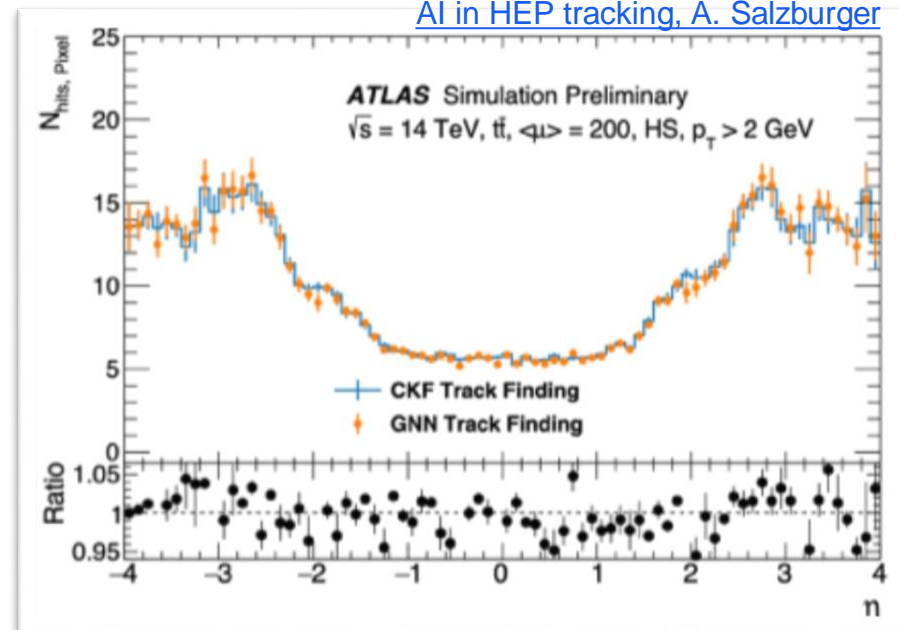
Hough Transform, Cellular Automaton, ACTS, GNN

- For silicon, CGEM, TPC, Drift Chamber ...

[ACTS for CEPC, Y. Zhang](#)

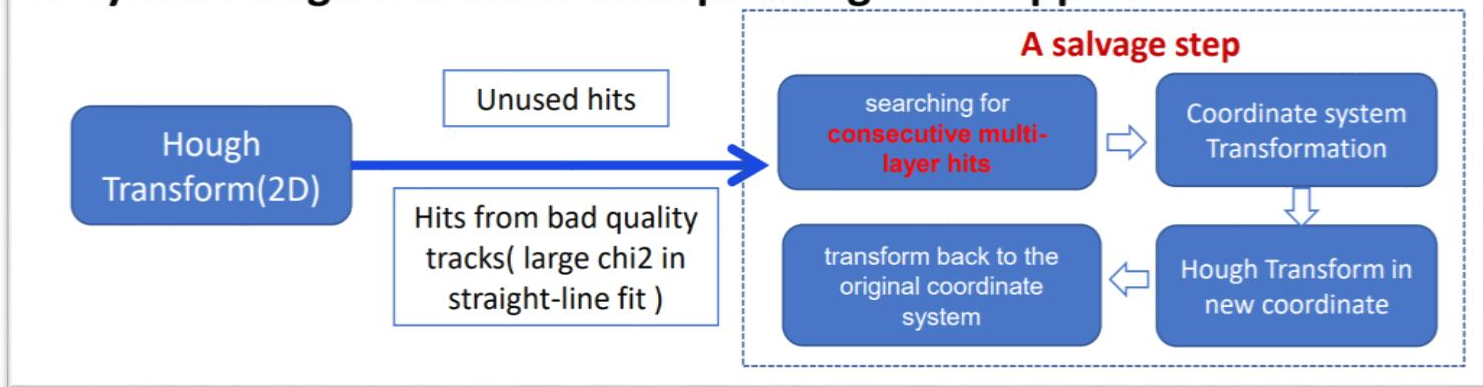


[AI in HEP tracking, A. Salzburger](#)

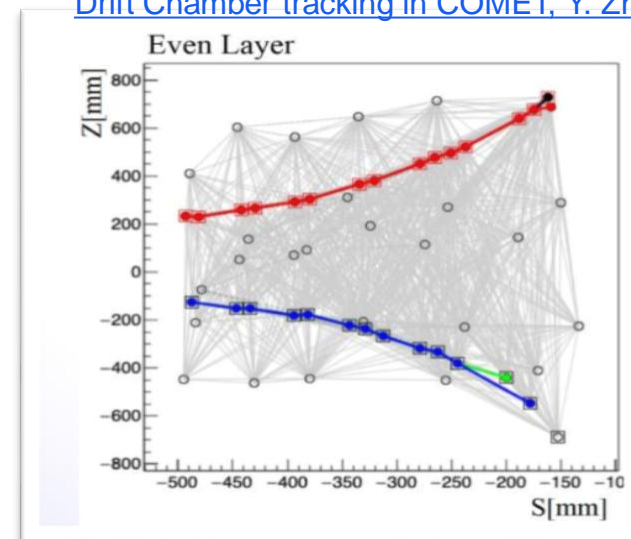


[STCF tracking, J. Zhang](#)

A Hybrid Hough Transform Incorporating Local Approach

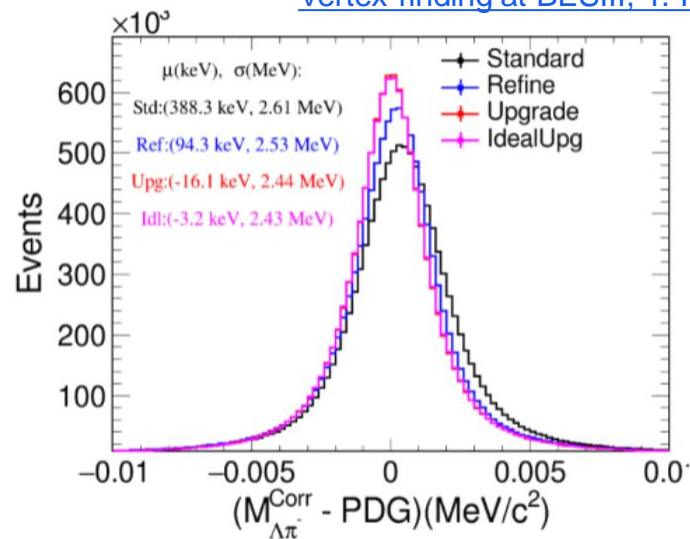
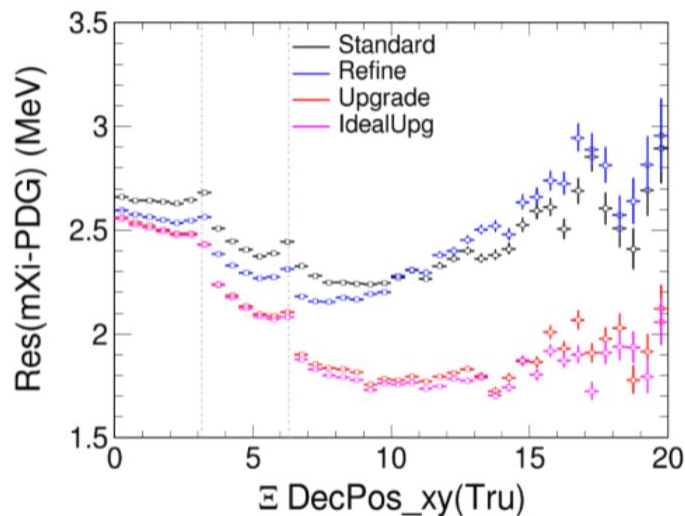


[Drift Chamber tracking in COMET, Y. Zhang](#)

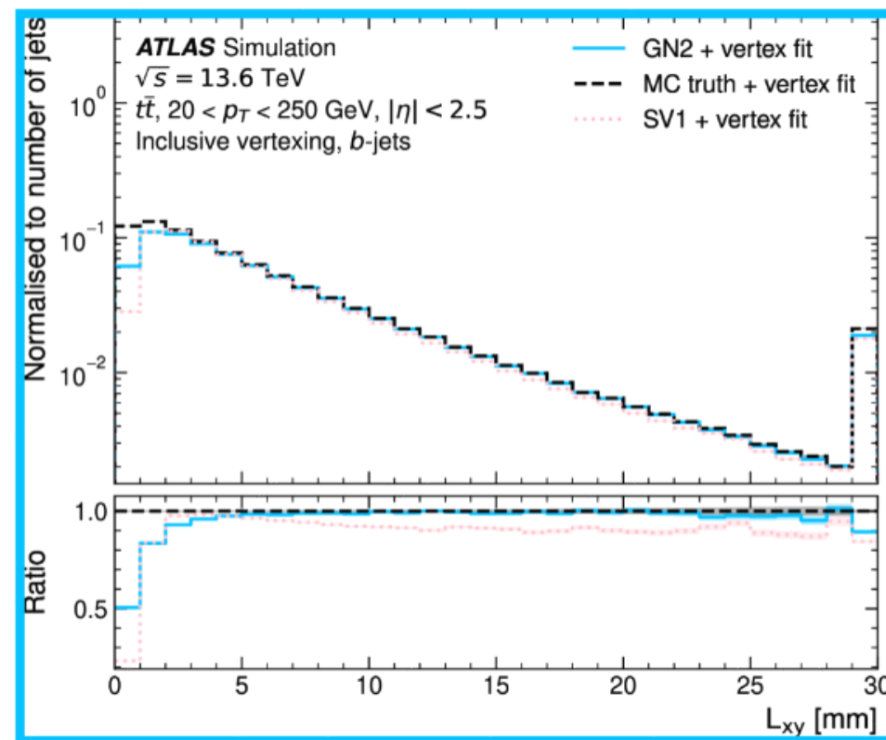


Vertexing

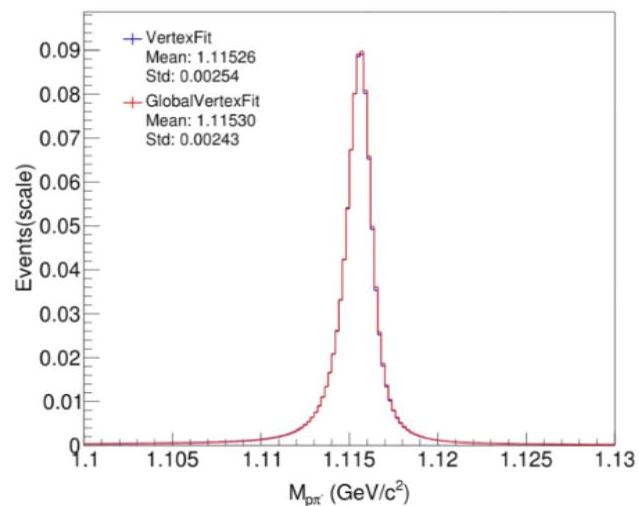
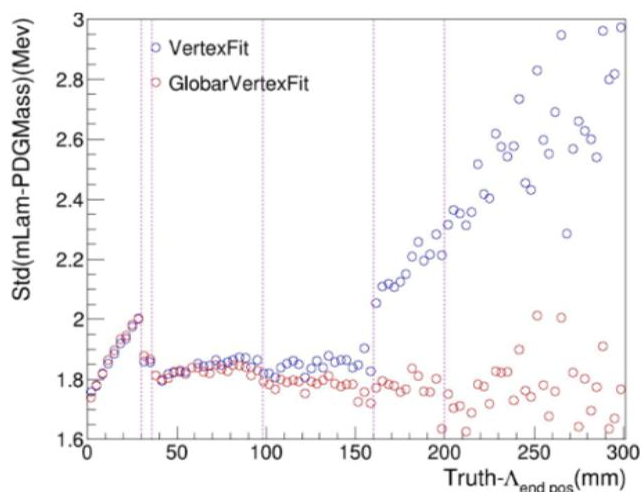
Vertex finding at BESIII, Y. Pei



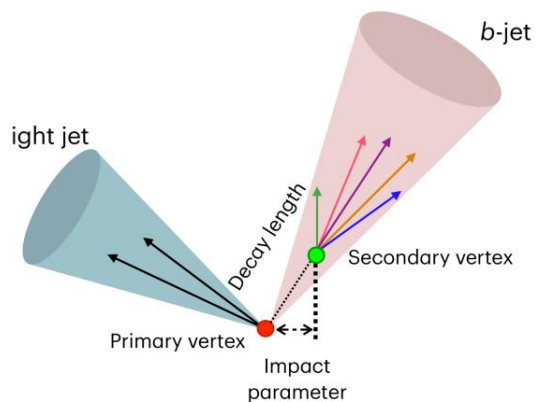
Secondary Vertexing and Flavour Tagging in ATLAS, B. Liu



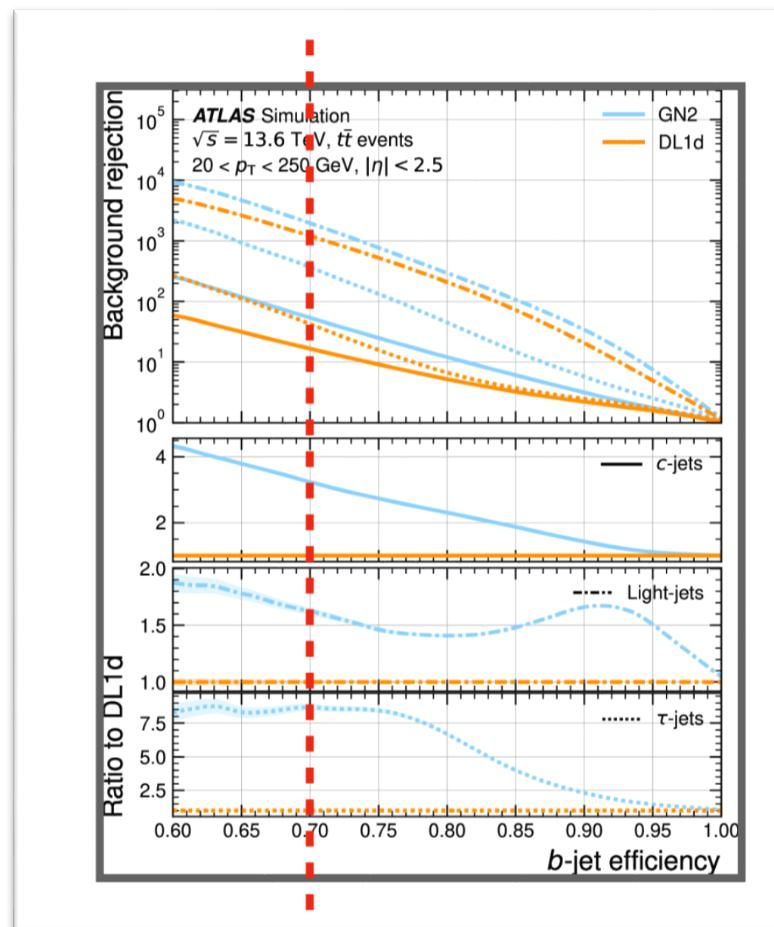
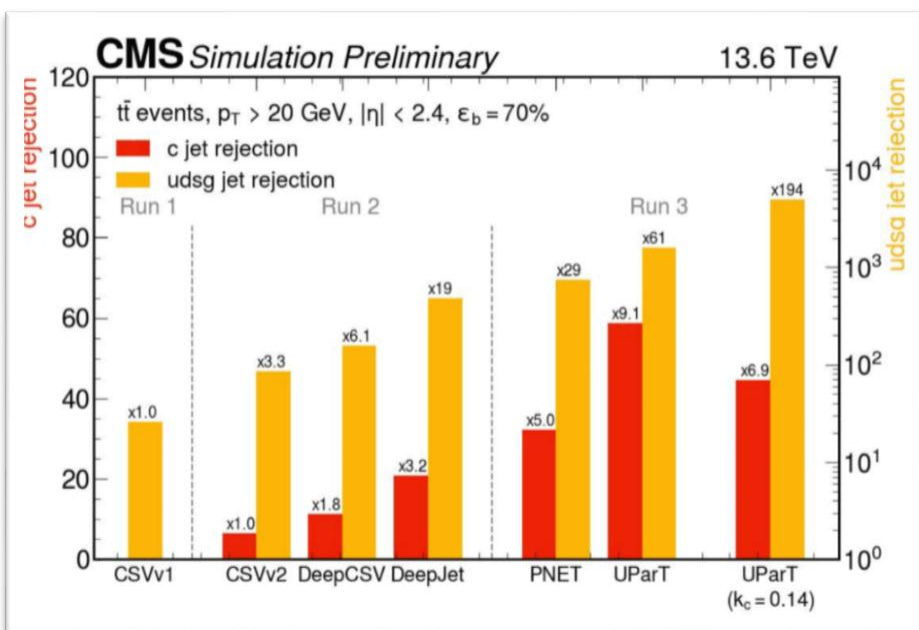
Vertex finding at STCF, M. Yu



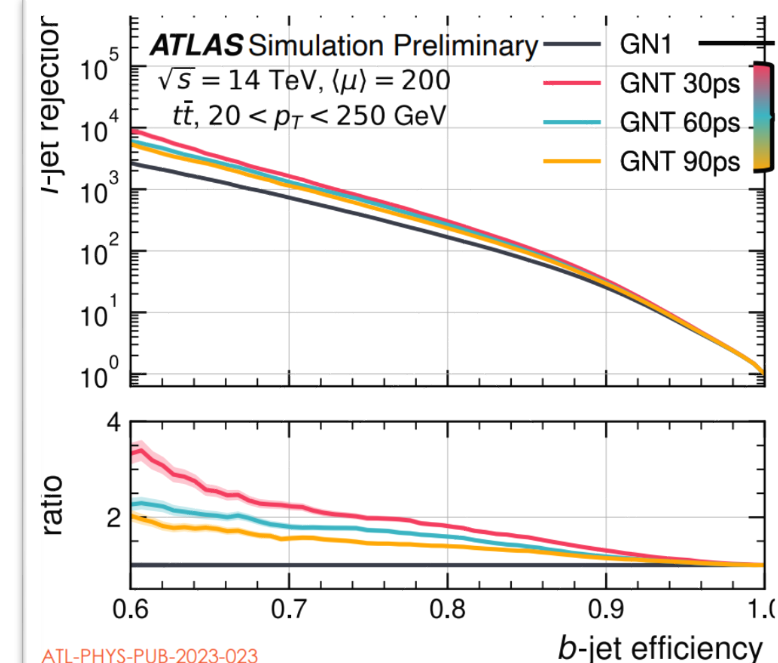
Flavour tagging and 4D tracking



[Advanced ML jet taggers in CMS, C. Li](#)



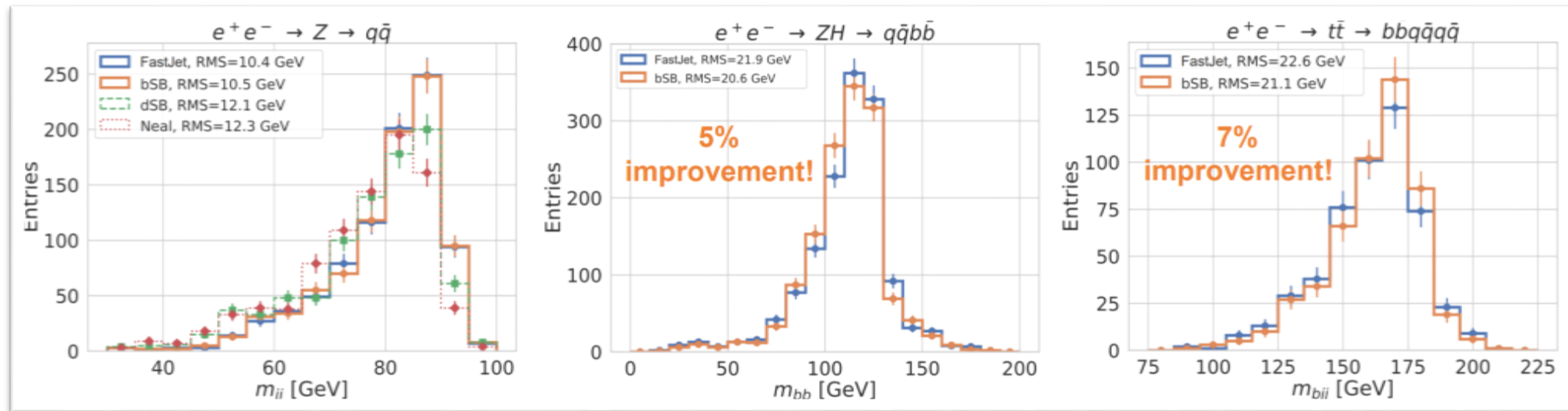
[Secondary Vertexing and Flavour Tagging in ATLAS, B. Liu](#)



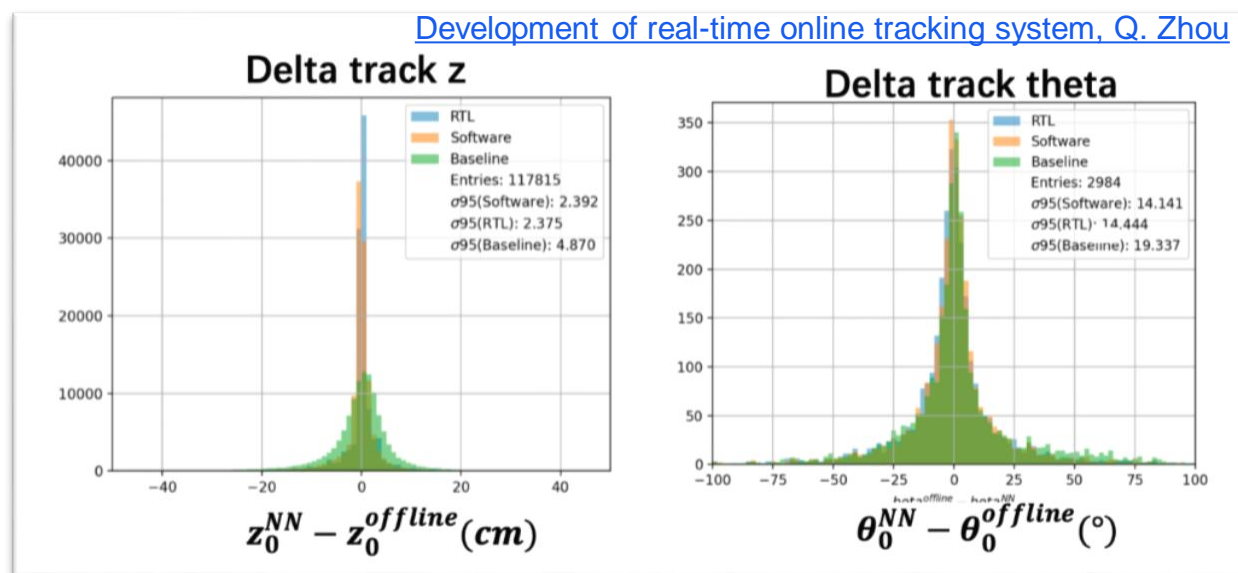
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New hardware driven tracking

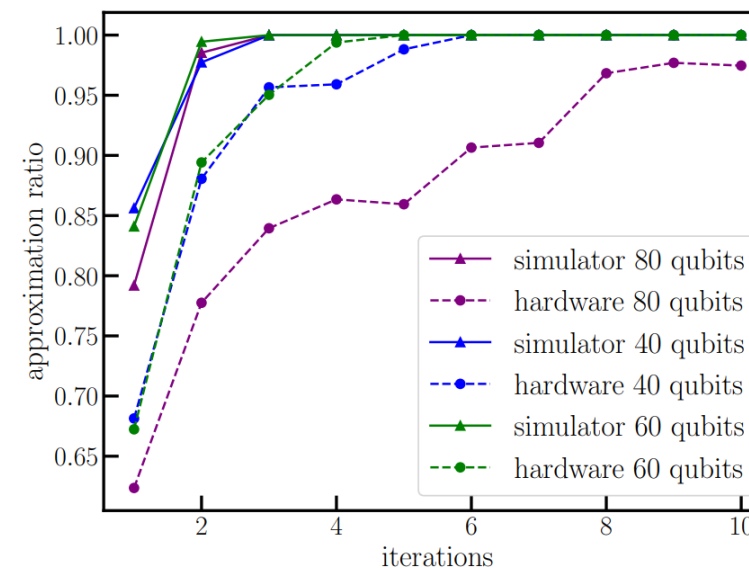
[Quantum & quantum-inspired algorithms
for reconstruction, H. Okawa](#)



[Development of real-time online tracking system, Q. Zhou](#)

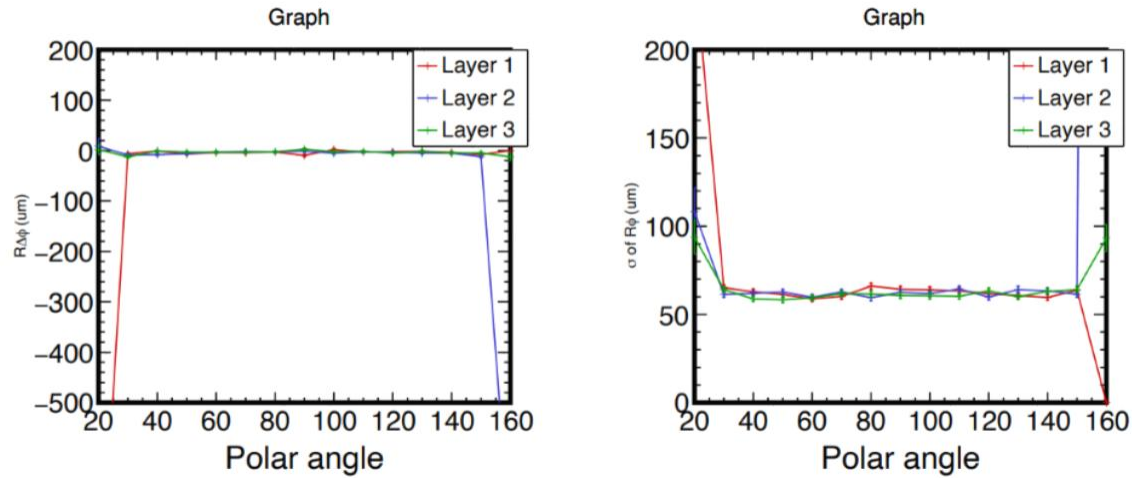


[Quantum computing for tracking, Y. Chai](#)

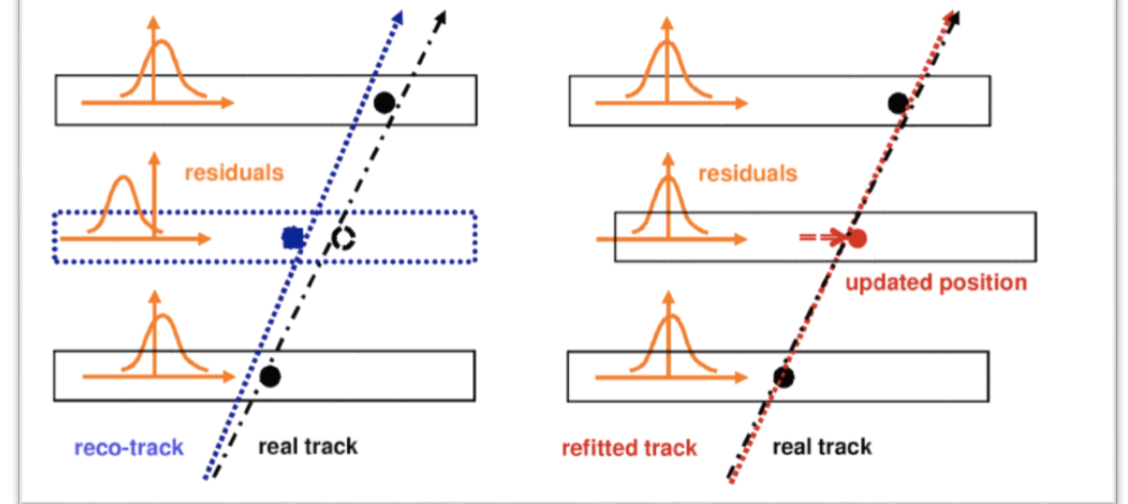


Calibration and alignment

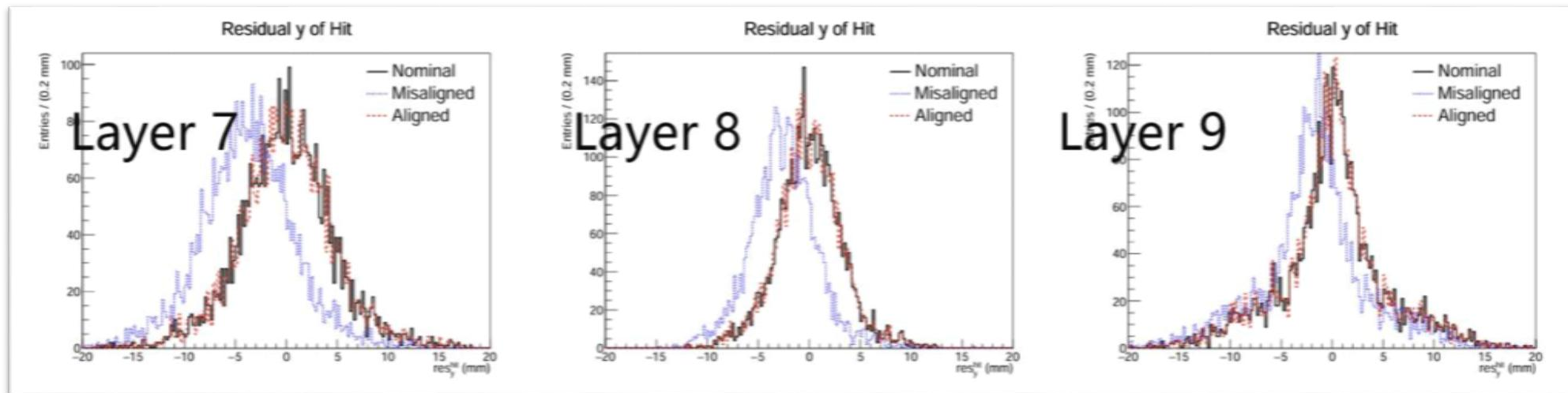
[STCF ITKW microTPC, J. Tang](#)



[ATLAS alignment, P. Bruckman](#)



[KF-based alignment in ACTS, X. Ai](#)



And many other interesting, inspiring talks...

Introduction	Dr Aiqiang Guo	08:50 - 09:00
Implementation of Acts into sPHENIX reconstruction (Remote)	Joe Osborn	09:00 - 09:25
ACTS for CEPC	Yizhou Zhang	09:25 - 09:50
ACTS for FASER tracking	Saimeng Zhang	09:50 - 10:10
Tea Break		10:10 - 10:40
Track reconstruction for BESIII CGEM	榕 李	10:40 - 11:05
STCF Tracking	Jin Zhang	11:05 - 11:30
CEPC ParticleFlow	Shengsen Sun	11:30 - 11:55

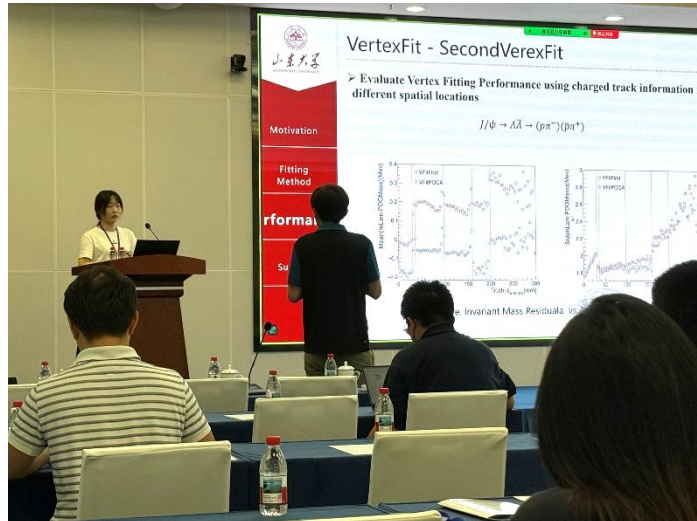
Tracking system in LHCb	Xuhao Yuan	14:00 - 14:25
Drift Chamber Tracking for COMET (Remote)	Yao Zhang	14:25 - 14:45
GNN application in drift chamber BESIII/STCF (Remote)	Xiaoshuai Qin	14:45 - 15:05
dN/dX analysis based on ML (Remote)	Guang Zhao	15:05 - 15:25
Darkshine tracking and vertexing	Zejia Lu	15:25 - 15:45
Tea Break		15:45 - 16:15
AI in HEP tracking (Remote)	Andreas Salzburger	16:15 - 16:50
ATLAS 4D b-tagging status and prospects (Remote)	Valentina Cairo	16:50 - 17:15
4D tracking with ACTS	Yanqi Wang	17:15 - 17:40
CMS 4D tracking (Remote)	Jyoti Babbar	17:40 - 18:05

CGEM microTPC clustering	Hao Yuan	09:00 - 09:20
STCF ITKW microTPC	Jiajun Tang	09:20 - 09:38
Cosmic track reconstruction of BESIII MDC	Yaxuan Li	09:38 - 09:58
Vertex fitting at BESIII	Yupeng Pei	09:58 - 10:23
Tea Break		10:23 - 10:50
Vertex reconstruction at STCF	Mingyu Yu	10:50 - 11:15
Secondary Vertexing and Flavour Tagging in ATLAS	Bingxuan Liu	11:15 - 11:40
Advanced ML jet taggers in CMS	Congqiao Li	11:40 - 12:05

Track-based alignment of the BESIII tracker with cosmic-ray data	jiajv wang	14:00 - 14:20
KF-based alignment using ACTS	Xiacong Ai	14:20 - 14:40
ATLAS alignment (Remote)	Pawel Bruckman de Renstrom	14:40 - 15:05
Quantum & quantum-inspired algorithms for reconstruction (Remote)	Hideki (英希) OKAWA (大川)	15:05 - 15:30
Quantum computing for tracking (Remote)	Yahui Chai	15:30 - 15:55
Tea Break		15:55 - 16:25
AI in software development	Tong Liu	16:25 - 16:50
Development of real-time online tracking system (Remote)	启东/Qi-Dong 周/Zhou	16:50 - 17:15
Progress on the MDC Track Reconstruction for STCF L1 Trigger Pre-Research	Zixuan Zhou	17:15 - 17:35
Tracking System Upgrades for LHCb Phase-II	Mingjie Feng	17:35 - 17:55
Summary	Xiacong Ai	17:55 - 18:10

Acknowledgements

- Many thanks to our speakers, conveners and All for the contribution and discussion



Acknowledgements

- Many thanks to the local organization committee for many things: food, coffee, transportation ...
 - 郭爱强 研究员
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 - 学生: 宋泽 苏心颖 李传洁
- Many thanks to the organization committee for talks invitation

会议组委会 (Organization Committee):

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- 张晋 (Jin Zhang, SYSU)



Outlook

- Shandong University has volunteered to host the next tracking workshop in beautiful **Qingdao**
 - Likely to be in **May 2026**
(please stay tuned)



Have a safe and nice journey back!