Self Introduction

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Spin Fest

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Self Introduction

- Name: Taebong Moon (太峯 文)

  Big Mountain

- Affiliation : Yonsei Univ. / RIKEN

- I have joined PHENIX collaboration since Run 13

- Analysis : Direct Measurement of D0

六本木 (Roppongi)

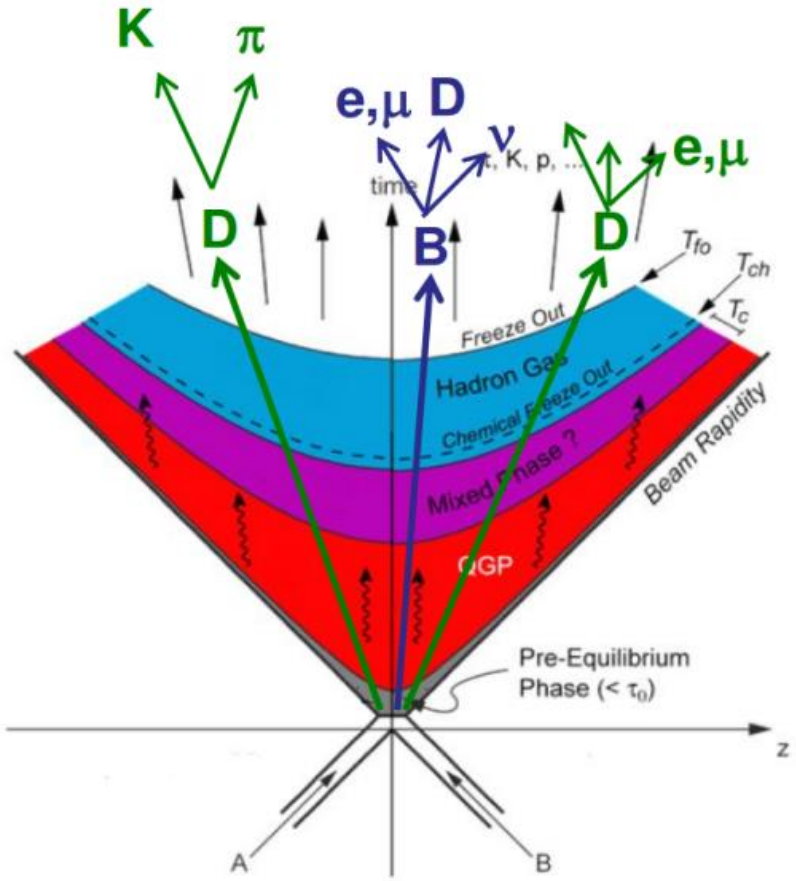
Motivation

Heavy quarks are produced in the early stage of the collisions in the primary partonic interaction.

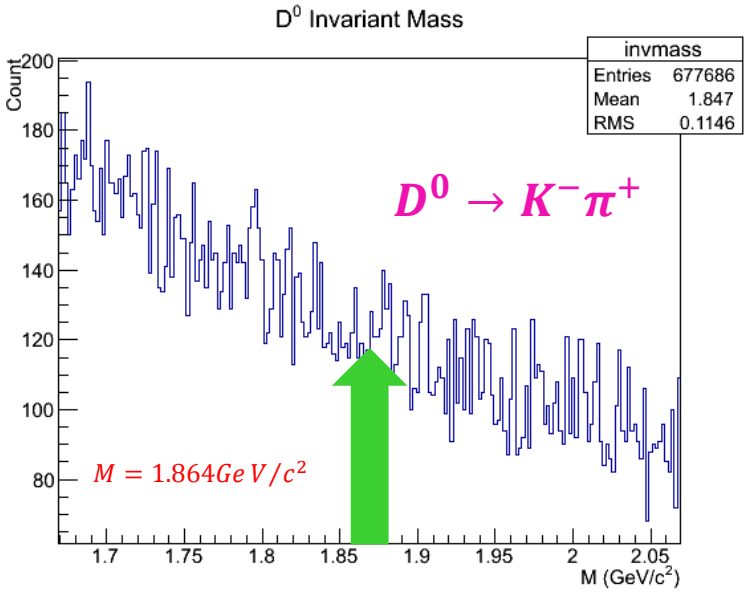
Initially produced heavy quarks experience the full collision history and carry information about the crossed medium.

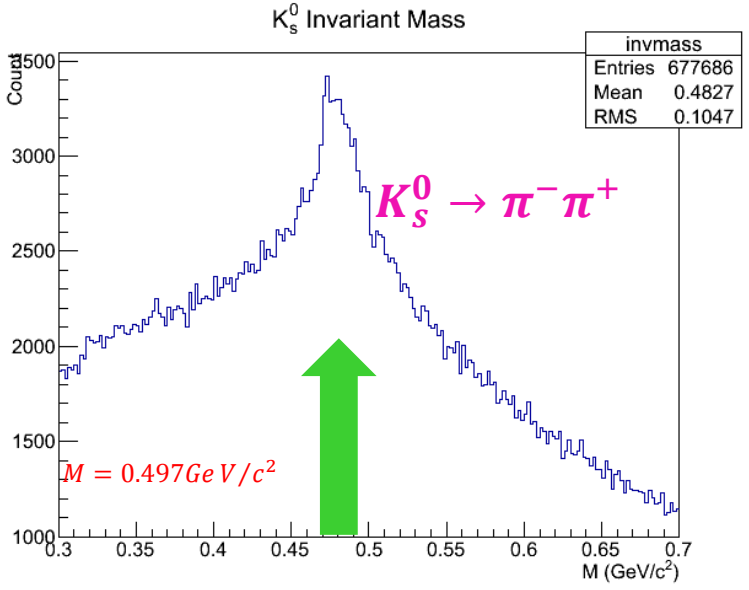
This particular aspect of heavy quarks makes them a very well suited probe for studying the properties of the QGP

Analyze $D^0 \rightarrow K^-\pi^+$ to investigate QGP



Selection Strategy of D^0





- Build pair of opposite sign charged tracks
- Assume: positive track (π^+), negative track (K^-)
- Invariant Mass

$$M = \sqrt{(E_- + E_+)^2 - (p_- + p_+)^2}$$

$$E_- = \sqrt{m_{K^-}^2 + p_-^2} \qquad E_+ = \sqrt{m_{\pi^+}^2 + p_+^2}$$

- **Run Number (physics data)**
  : 360934_9000
  (MB_Run12pp 200GeV)
- **# Event**
  : 439,787

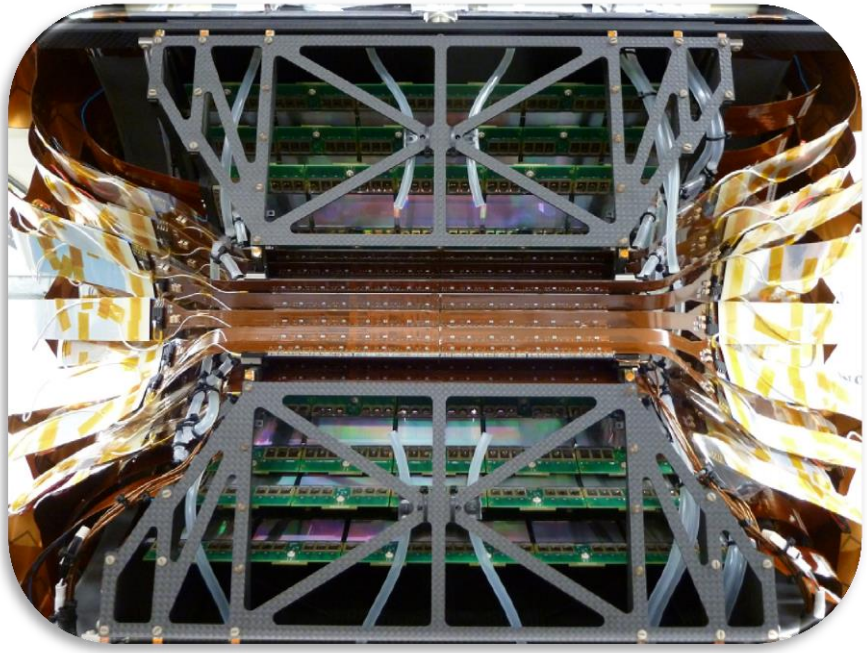
Now, not enough

Correlated real $K^-\pi^+$ tracks will make peak at corresponding mass region

VTX Detector

The VTX detector was installed near the collision vertex in central arms.

- Vertex measurement
- Charged particle tracking
- dE/dx measurement for PID
- Single electron measurement from charm and bottom separately
- Distinguish primary and secondary track



Layer	Kind	R(cm)	Z(cm)	RO Channel
0	Pixel	2.5	±10	1,310,720
1	Pixel	5	±10	2,671,440
2	Stripixel	11.7	±16	122,880
3	Stripixel	16.6	±19	221,184

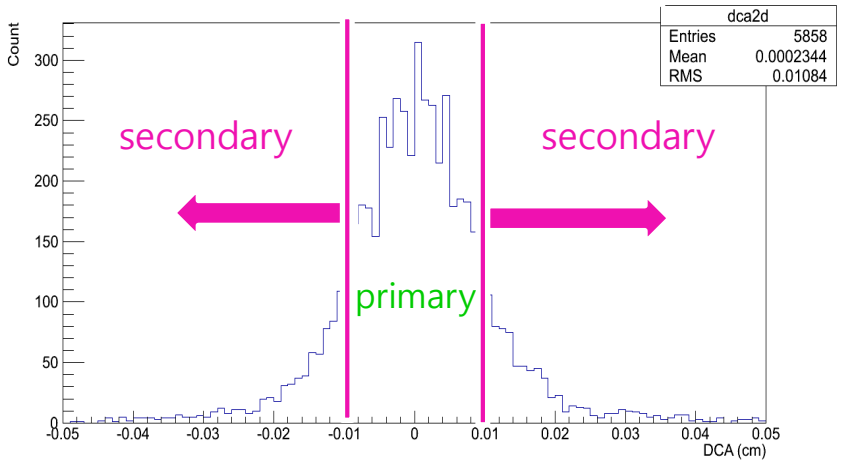
Secondary Vertex Topology-DCA

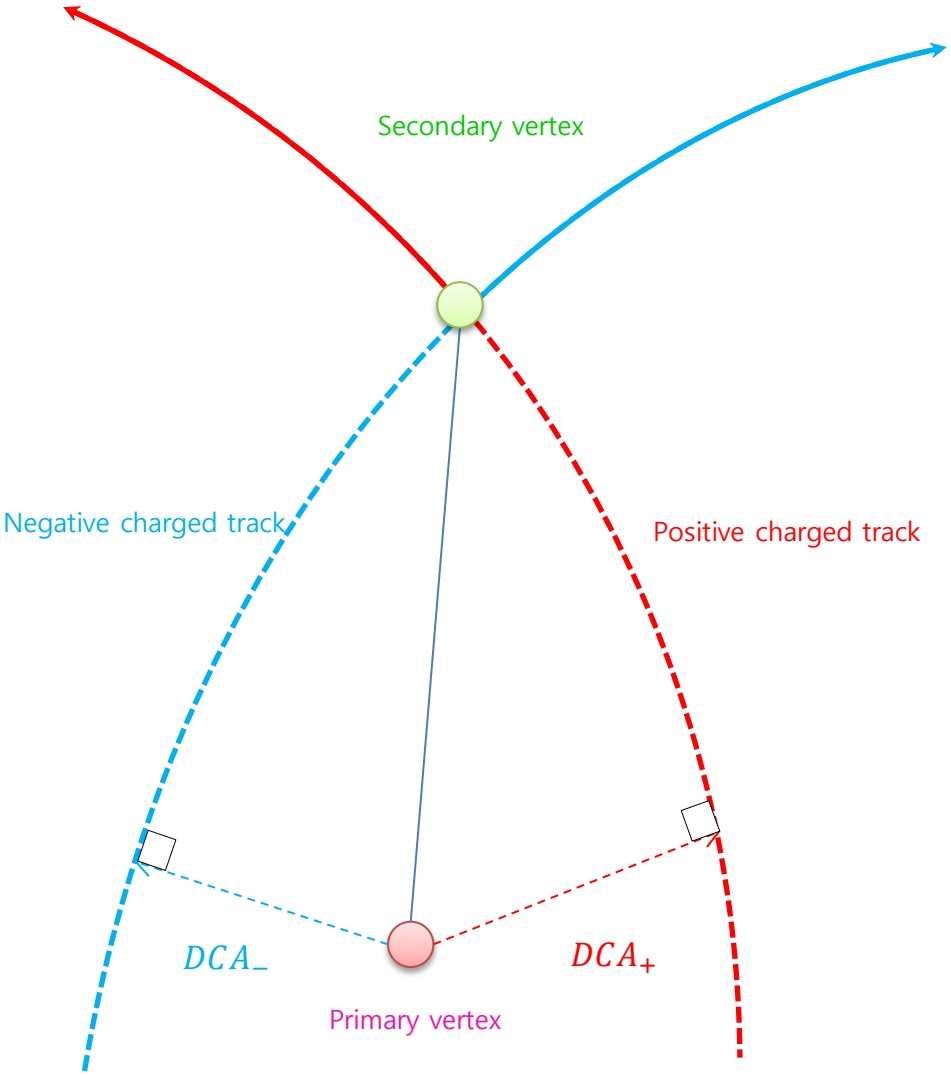
Distance of **C**losest **A**pproach
of trajectory to primary vertex.

DCA can distinguish secondary track and primary track

→ Need secondary track

DCA Distribution





Secondary Vertex Topology-PA

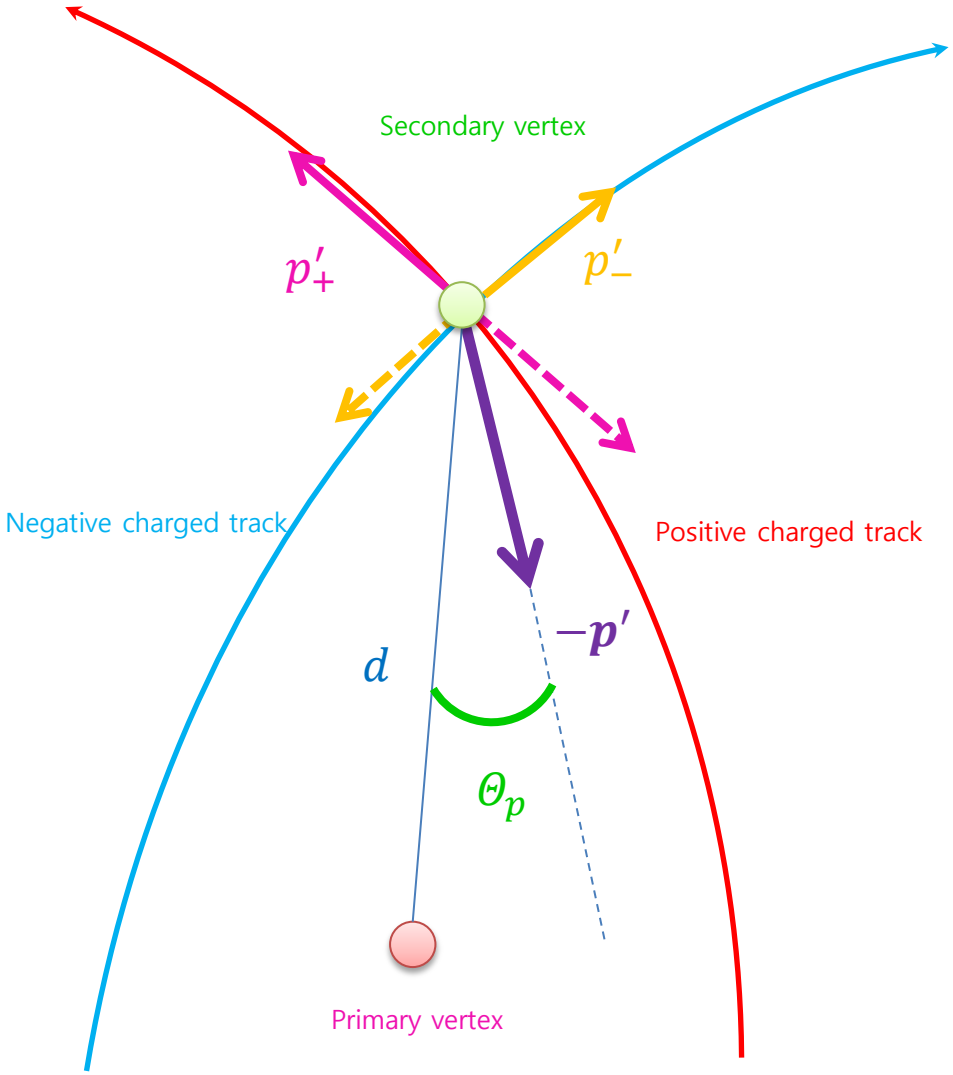
Pointing Angle

Well-displaced $D^0 \to K^-\pi^+$ topologies are characterized by Good pointing of the reconstructed D^0 momentum to the primary vertex

$\Theta_p \sim 0$: good pointing
$\Theta_p \gg 0$: bad pointing

$$\Theta_p = \cos^{-1}\frac{p' \bullet d}{|p'||d|}$$

Position and momentum at SV are required: not yet measured



At Sushi Zanmai

Thank you

BACKUP