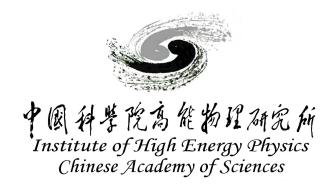
CEPC Tracking System Optimization



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Outline

- Physics requirements
- Tracking system of CEPC Reference Detector concept
- Tracking optimization with momentum
- Tracking optimization with PID
- Tracking optimization with material budget
- Summary and Outlook

Tracking performance

- Transverse momenta > 1 GeV, reco eff > 99%.
- Momentum reso ~ 0.1%
- Lepton identification: Lepton ID of 99% with momenta > 5GeV
 Mis-ID < 2%, lepton inside jets for jet flavor and jet charge
- Charged kaon identification: efficiency and purity > 90%
- Photon ID and energy measurement : 20%/sqrt(E) cov.1%, pi0 eff and purity > 95%
- Jet and missing energy: BMR better than 4%
- Flavor tagging: b-jet > 80%, c-jet > 60%

Physics processes and key observables

Physics process	Measurands	Detector subsystem	Performance requirement
$ZH,Z\rightarrow e^{+}e^{-},\mu^{+}\mu^{-}$ $H\rightarrow \mu^{+}\mu^{-}$	$m_H, \sigma(ZH)$ ${ m BR}(H o \mu^+\mu^-)$	Tracker	$\Delta(1/p_T) = 2 imes 10^{-5} \oplus rac{0.001}{p({ m GeV}) \sin^{3/2} heta}$
$H o b ar{b}/car{c}/gg$	${ m BR}(H o bar{b}/car{c}/gg)$	Vertex	$\sigma_{r\phi} = 5 \oplus rac{10}{p({ m GeV}) imes \sin^{3/2} heta} (\mu { m m})$
$H o q ar q, WW^*, ZZ^*$	${\rm BR}(H\to q\bar q,WW^*,ZZ^*)$	ECAL HCAL	$\sigma_E^{ m jet}/E = 3 \sim 4\%$ at $100~{ m GeV}$
$H o \gamma \gamma$	${ m BR}(H o\gamma\gamma)$	ECAL	$\Delta E/E = rac{0.20}{\sqrt{E({ m GeV})}} \oplus 0.01$

Tracking system of CEPC CRD

- Vertex
- Silicon Tracker
- Drift chamber

Tracking optimization with momentum

CRD baseline tracking with only silicon

Tracking optimization with PID

Tracking optimization with material budget

Summary and Outlook