W/Z physics in CDR

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News
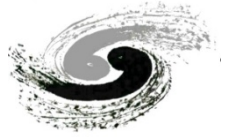
- **Some discussion about CEPC Z pole running .**
  - **http://indico.ihep.ac.cn/event/7709/**
  - **Two possibility:**
    - **E=90 GeV, L=1.6 X 10^{35} cm^{-2}s^{-1}, solenoid field = 3T (new default)**
    - **Two year running proposed by accelerator team**
- **WW threshold scan**
  - **Proposal from accelerator team**
  - **One year running about 160GeV , 3T**
  - **Total luminosity 3.2 ab^{-1}**

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CDR writing
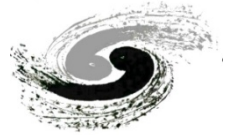
- CEPC CDR draft is on git
  - http://cepcgit.ihep.ac.cn/cepcdoc/CDR/tree/master/CDR_draft
  - need to register a new account for the first time)
- To checkout the CDR:
  - git clone git@cepcgit.ihep.ac.cn:cepcdoc/CDR.git
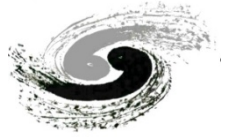- **Plan to cover the prospects of 6-7 key parameters.**

Observable	LEP precision	CEPC precision	CEPC runs	$\int \mathcal{L}$ needed in CEPC
m_Z	2 MeV	0.5 MeV	Z threshold scan runs	1ab^{-1}
m_W	33 MeV	2-3 MeV	WW threshold, ZH runs	5ab^{-1}
A_{FB}^b	1.7%	0.1%	Z threshold scan runs	1ab^{-1}
$\sin^2\theta_W^{\text{eff}}$	0.07%	0.01%	Z threshold scan runs	1ab^{-1}
R_b	0.3%	0.05%	Z pole	1ab^{-1}
N_ν	1.7%	0.05%	ZH runs	5ab^{-1}
R_μ	0.2%	0.01%	Z pole	1fb^{-1}

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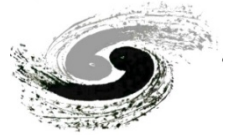# Production with 3T magnetic field and new geometry
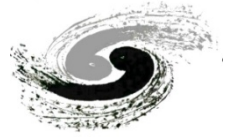
- **Afb(l): lepton angular resolution**
  - 100k full sim Z->ll at Z pole to study lepton angular resolution
  - 10M~100M fast sim to Z->ll and Z->tautau to understand background and perform fit for weak mixing angle
- **W mass (direct approach)：jet energy resolution**
- **N_v : photon energy resolution**
- **R_b: "B jet efficiency" vs "cjet/light rejection "**
 - Need more Z->bb simulation ?

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Backup

Performance input

- **Identify some performance input needed to support the W/Z physics prospect study**

  – **May need to repeat some study with 3T magnetic field and new detector geometry**

- **Afb(l): lepton angular resolution**

- **R_b: "B jet efficiency" vs "cjet/light rejection "**

- **W mass (direct approach)：jet energy resolution**

- **W mass (threshold scan): ?**

- **N_v : photon energy resolution**
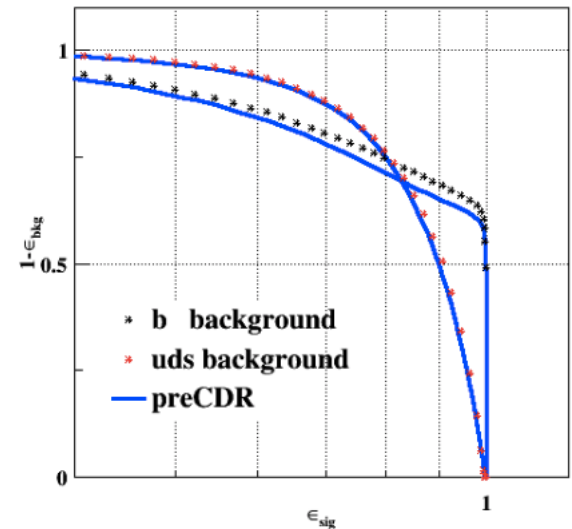
CEPC W/Z physics Plan for CDR

- **Plan to cover the prospects of 6-7 key parameters.**
- **Text for CDR need to ready soon**
- **Contributions are welcome**

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