Introductory remarks

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Outline

- New meeting times
- Repository for text
- Outline of CDR
- November meeting
    - International conveners invited

Detector and Physics: Conceptual Design Report

Still about one year of work

Preliminary

- May ~~1~~ 3, 2017: Monday, P&D meeting
  - Decide on editors and timescale *today!*
  - ✓ Establish SVN/git repository area
- September 30: Text for all subsections finalized
  - Includes R&D results available until this date
  - All text committed to repository
- October 31: Version for internal review finalized
  - Harmonization of text across chapters
  - Finalize introduction and other common aspects (references, authors, etc)
- December 20: Version for external review ready
- March 1, 2018: Release to public

To be discussed at this meeting

New meeting times

- Move to weekly meetings
- Have **one slot in the morning and one slot in the afternoon**. This will allow for colleagues from Europe and America to connect to at least one of them.
  - Possibility 1:
    - Monday, at 3 pm — biweekly (next would be August 7)
    - Thursday, at 9 am — biweekly
  - Possibility 2: (keep the same day)
    - Monday or Thursday, at 9 am and 3 pm
    - (not sure if rooms at IHEP are available)
- Possibility of having one time slot in the evening of issues that require the presence of everyone (this allows colleagues from all the world to attend)
  - What time is preferred in China? 8 pm?
- Suggestions:
  - Start with a preliminary solution for now (possibility 1) and adjust if needed

Repository for text

- Propose to use Git (instead of SVN) for CDR text
  - Advantage: It allows better treatment of conflicts;
  - Disadvantage: New tool but similar to SVN
- IHEP CEPC Git Repository:
  - http://cepcgit.ihep.ac.cn/
    - Group: cepcdoc
      - Project: CDR
    - Manqi and Gang are owners of this cepcdoc group and CDR project
  - Registration is now open for everyone.
  - People who wants to join the project needs to register at this website
    - We can then add you to the CDR project as developer/editor

CDR Organization

- **Possibility 1: One detector concept**
  - This detector needs to "work" at high-luminosity for Z physics
  - TPC or full Silicon?
  - Consider options:
    - TPC, full silicon and drift chamber
    - Particle Flow and Dual readout calorimeter
- **Possibility 2: Detector concepts in equal footing**
  - TPC-based, full silicon-based and drift-chamber detectors
  - Requires manpower for full simulation in equal footing of the two concepts
  - Very difficult to achieve within the timescale of 2017
- **Possibility 1.5:**
  - Describe the two/three concepts early in the CDR (low-field/high-field)
  - Detector options described in parallel in the text
  - Physics performance discussed together at the end

Possible CDR outline

Preliminary

1. CEPC Physics Potential
    1. Higgs physics
    2. Electroweak precision physics
    3. Searches for physics beyond the Standard Model
    4. Flavor physics

   } Theory group

2. Experimental conditions and detector requirements
    1. The CEPC experimental environment
        1. Beam backgrounds, polarization, etc
    2. Detector requirements for e+e- physics
        1. Track momentum and jet energy resolution, flavor tagging, particle identification
    3. Basic description of Detector Concepts
        - TPC tracking system (baseline)
        - All-silicon tracking
        - Drift chamber and DR calorimeter
3. Vertex detectors
4. Tracking system
    1. Detailed tracker concepts
        1. The TPC tracking system
        2. The All-Silicon tracking system
        3. The Drift Chamber tracking system
    2. Beam induced backgrounds in tracking system
    3. Performance

Possible CDR outline

Preliminary

5. Calorimetry
    1. Particle flow calorimeter
        1. Hadronic calorimeter
        2. Electromagnetic calorimeter
    2. Dual readout calorimeter
    3. Calorimeter performance
6. Detector magnet system
7. Muon system
    1. Conceptual design of muon system
    2. Muon reconstruction algorithm and system performance
8. Readout electronics and data acquisition (?)
9. CEPC interaction region and detector integration (MDI)
10. Physics performance
    1. Simulation and reconstruction
    2. Luminosity measurement
    3. Energy measurement
    4. Performance of low-level physics observables
    5. Detector benchmark processes
11. Future plans and R&D prospects

Work towards CDR

- Need to integrate work done in **Detector subgroups** with work done by **Simulation subgroup**
- Decide and review final options for detector to be simulated:
  - This will be our baseline detector!
    - Deviations from "Full Simulation" should be clearly explained in the CDR
    - Need to agree upon details now, before moving with large scale CDR work
- **Suggestions**:
  - Discuss within detector groups to decide what designs should be put forward as baseline
  - Common meetings between each detector subgroup and simulation subgroup to clarify details
  - Decisions need to be documented in **short notes** made available for review by CEPC colleagues (these can then turn into parts of the CDR)
  - Detector subgroups should provide manpower to aid on any needed improvements on digitization and geometry
  - Integrate international partners in discussions. We are planning **one** CDR with an integrated structure

Work towards CDR

- Need outline proposals from each subgroup
- Need name proposals for contact editors of each section
  - So far, only got information from Calorimeter subgroup
  - CEPC Gitlab server:
    - http://cepcgit.ihep.ac.cn/groups/cepcdoc
- If you are not providing this today, please let me know when you will do it by
  - When will your subgroup meet to discuss this?
- **We will move to weekly meetings**

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CLIC: Example of Vertex Section

CLIC: Example of Calorimeter Section

Agenda

Wednesday, 3 May 2017	
15:00 - 15:20	Introduction *20'* Speaker: Joao Guimaraes Costa
15:20 - 15:40	MDI *20'* Speaker: Dr. Hongbo ZHU (IHEP)
15:40 - 16:00	Vertex *20'* Speakers: Prof. Qun OUYANG (IHEP), Mr. Xiangming Sun (CCNU), Prof. Meng Wang (Shandong University)
16:00 - 16:20	Tracker *20'* Speaker: Dr. Huirong Qi (Institute of High Energy Physics, CAS)
16:20 - 16:40	Calo *20'* Speakers: Haijun Yang (Shanghai Jiao Tong University), Prof. Tao HU (IHEP), Dr. Jianbei Liu (University of Science and Technology of China)
16:40 - 17:00	Muon *20'* Speaker: Prof. Liang Li (Shanghai Jiao Tong University)
17:00 - 17:20	Magnet *20'* Speakers: Mr. Zian ZHU (高能所), Dr. Feipeng NING (高能所)
17:20 - 17:40	Simulation *20'* Speakers: Mr. Manqi Ruan (IHEP), Dr. Gang LI (Experimental Physics Division, Institute of High Energy Physics)

Extra Slides

Detector Pre-CDR Outline

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Detector Pre-CDR Outline

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CLIC Detector CDR - an example

Contents

CLIC Detector CDR - an example

CLIC Detector CDR - an example

International Collaboration

- **INFN, Italy**
  - Possible new detector components
    - Full tracker concept, drift chamber tracker, dual readout calorimeter, muon detector
  - Electroweak physics studies
- **Taiwan Collaboration**
  - Interested in software and physics studies (https://indico.cern.ch/event/579684/overview)
    - Lumical, EW measurements (Sinica), Jet energy scale studies (NCU) and ECAL Studies (Taiwan U)
- **Vinca Institute, Belgrade, Serbia**
  - MOU signed with IHEP
- **University of Chicago, USA**
  - Young Kee-Kim
    - Chicago/Beijing Workshop, June 5-17 (tentative)
- **Monash University, Australia**
  - Tong Li (李佟)
- **University of Liverpool, UK**
  - Yanyan Gao, Lecturer
- **Others**,
  - Barcelona, Iowa State, Univ. of Geneva, SLAC, Weizmann Institute, Mainz U