Future Plan of BEPC

He Sheng Chen

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Welcome Members of BES from Domestic and U.S. Universities
Thank for successful collaboration in BES

BES 2000 faces both good opportunity and great challenge

√ **Good running of BEPC/BES/BSRF**
√ **Good results from BES**
√ **More support to BEPC/BES/BSRF**
? **Physics & running plan for next years**
? **MDC III: He gas? Al wires? Schedule?**
? **BEPC II: design, R&D ......**

More Support to IHEP

- **BEPC running budget increased from 27.5M to 50M per year**
- **30M /year improvement budget for BEPC during 1999 - 2001**
- **IHEP is under major reforms:**
  - **slim and capable team**
  - **more research funds**
  - **better salaries and housing**
  - **improve leadership and management**
- **More support to international collaborations**

Status of IHEP

1. Status of BEPC/BES

- **Spring 1999 the R value measurement between 2 - 5 GeV was carried out: beam time 1548hr, maximum current 75 mA @ 2.25GeV with peak luminosity $10^{31}cm^{-2}s^{-1}$. Physics results will be published soon.**
- **99/00 running period (about 150 days) machine and detector work well. Peak luminosity is $5\times10^{30}cm^{-2}s^{-1}$. More than 200K J/ψ events /day with a record of 320K/day. 25M on-line J/ψ events were collected in total. The data quality was been improved significantly.**
- **50M J/ψ events expected by summer 2001**

2. Synchrotron radiation running: 120mA @ 2.2 GeV, life time 20-30 hours

3. Non-Accelerator experiments:

- Yangbajing - Argo RPC carpet project started
- Hard X ray modulated Telescope approved
- γ ray burst detector to be launched Autumn.
- Dark matter search from DAMA

4. Progress in international collaborations: AMS, CMS, ATLAS....

Chinese Academy of Sciences made Important Decisions

1. Development Strategy of Chinese High Energy physics

   1) Future development of BEPC is BEPCII:
      - Upgrade of BEPC and BES, increasing Luminosity by a factor of 10;
      - Main physics window is in the J/ ψ energy region.

   2) Non-accelerator physics experiments:
      - ν experiments
      - astrophysics experiments
      - cosmic ray measurements

   3) International cooperation.

2. Shanghai Synchrotron Radiation Facility should be started a.s.a.p.
3. Advanced accelerator technology and its applications:
   - High density proton linac
   - FEL
   - Medical imagine & treatment
   - Material irradiation

The CAS decision was supported by the Chinese Government.
State Planning Commission received the instruction about BEPC II.
CAS/IHEP started discussion with them.

Physics Goals of BEPCII

Considering new results and successful running of B-factories, the physics window remained for the future development of BEPC is mainly in the Charm physics:

1. Search for glueball and quark-gluon hyperid
2. Light hadron spectroscopy
3. Charmed baryons
4. Rare decay of J/ ψ

....

They are very important for development of QCD: perturbative and non-perturbative QCD, as well as intermediate region. BEPC has unique advantage for the physics, which can not be done by B-factories.

BEPC II

• The studies require BEPC mainly running at the threshold region of J / ψ, where the production cross sections are very high.

• The best choice is to upgrade machine and detector (BEPCII) with relative less cost within relative short period, to increase luminosity by one magnitude.

Detail proposal, including budget & schedule, will be ready by the end of this year.
An international review will be organized in Oct..

Major improvements in Machine

Goals:
- reduce bunch length
- increase beam current

Key Technical approaches under discussion:
- 500 MHz RF → reduce bunch length
- SC cavities → increasing current + HV (>2MV)
- new vacuum chamber → impedance < 1 ohm
- mini-beta → reduce bunch length (1 - 1.5 cm)
- multiple bunches (6) and bunch trains (3, t=6ns) with pretzel → increasing current
- linac injector → increase inject rate (> factor of 10)

Major improvements in BES

Goals:

improve resolution → reduce sys. errors
adapt to multiple bunch

Issues under discussion:
- new barrel shower counters
- new readout electronics
- fast trigger system
- Luminosity monitor
- TOF?
- MDC IV?
- New vertex chamber?
- New Muon chambers?

Interface issues between Machine and Detector

- Optimized beam energy value: J/ψ?
- Interaction region:
  - Micro beta position and size
  - magnet doors
- background @ $2\times6\times3\times16$mA

- **Readout electronics @ 2×6×3 bunches**

Continue and enhance international collaboration for BES III

1. Successful collaboration
2. High statistics data and good results foreseen
3. BEPC II: interesting physics window
4. Funding agencies from both China and US support the collaboration.
Major issue for China-US Joint HEP committee meeting
5. Continue and promote collaboration with Korea and UK.

Enhance Domestic Collaboration

- **BES II: Univ. Groups made important contributions to data analysis, shift and detector maintenance.**
  - **IHEP is happy to see and will help Univ. Groups to take more responsibilities in BES**
  - **NFSC is going to support the key univ. Groups in BES, according to suggestion of IHEP**
- **BES III: Univ. Group are welcomed to**
  - **take responsibility of a subdetector or its subsystem**
  - **join a subdetector group and take some responsibilities.**