

# CEPC results by February 2022

## CEPC International Annual Workshop in Nanjing: November 8-12, 2021

Many new results expected for that, including new detector concept, new accelerator optimization points

- **Physics and software:**
  - Physics potential study on **Flavor** measurements, especially LFU & LFV
  - Detector Requirement analysis w.r.t the Flavor Physics Program at Z pole
  - Performance study about Lepton and Tau reconstruction
  - $H \rightarrow bb, cc, gg$  measurements, and the dependence between anticipated accuracy V.S. the flavor tagging performance
  - Jet Charge measurement at Z pole operation
  - Impact of **360 GeV run** on Higgs/Top measurement
  - Software framework based on Key4HEP
- **Detector:**
  - New detector concept based on crystal calorimeter
  - Calorimeter updates:
    - ScW-ECAL **prototype** built and results available; Sc-HCAL prototype construction mostly finished
    - Crystal calorimeter design
    - Dual readout calorimeter from Korea colleagues (in addition to Italian colleagues)
  - Vertex detector **prototype** (1-2 talks — new full size CMOS sensor, SOI, mechanics)
  - Drift chamber PID using  $dN/dX$
  - TPC **prototype** finished and new results available

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- Accelerator:
  - Second IARC meeting will be held from Oct. 11-15, 2021
  - **New high luminosity parameters:** corresponding lattices from  $t\bar{t}$ , Higgs, W to Z have been established and the DA with errors on Higgs is going on.
  - New low emittance booster lattice design compatible to high luminosity parameters
  - 20 GeV S+C band linac injector is established, and detailed study is on going to accommodate high luminosity Z
  - Timing and injection/extraction for collider operation is under optimization
  - Collective effects study for high luminosity parameters, especially Z-pole is under way
  - **MDI** design parameters updates
  - Cryogenic distribution system is under optimizing
  - Hardware R&D:
    - a) 650MHz test cryomodule (2\*2cell) has been completed and installed into test station, and the test system with beam will start in next step;
    - b) Cavity vertical test and horizontal test and machine test facility with beam; (New SC lab of 4500m<sup>2</sup> has been completed in June 2021,)
    - c) 1 m long SC quadrupole prototype is underway;
    - d) Second 650MHz klystron with designed efficiency of 77% is under fabrication, and the 80% efficiency multi-beam klystron design is underway;
    - f) Collider ring dual aperture quadrupole design has reached design goal, and will be checked by modifying the first 1m long test prototype;
    - g) Mechanical design of full size magnets of booster dipole, collider dual aperture dipole and sextupole, etc is underway;....