Dubna

JINR was founded in 1956 as an international scientific organization

An intergovernmental organization established through the Convention signed on 26 March 1956 by eleven founding States and registered with the United Nations on 1 February 1957. JINR has at present 16 Member States: Armenia, Azerbajan, Belarus, Bulgaria, Cuba, DPRK, Egypt, Georgia, Kazakhstan, Moldova, Mongolia, Romania, Russia, Slovakia, Uzbekistan, Vietnam

Current and planned JINR-China cooperation in home HEP experiments

- BESIII
- JUNO
- STCF
- NICA/MPD
- NICA/SPD
- CEPC

JINR interests in CEPC

- Data analysis and development of the experimental program
- High-precision theory calculations, theory support of experiments
- Data handling: GRID infrastructure, data storage and processing, software development, MC production
- Hardware R&D and production – see the next talk

Theory calculations (I)

- Our theory group has more than 30 years experience of precision calculations
- We provided theory support for the past and future experiments at:
  - LEP1/LEP2
  - HERA
  - LHC
  - BEPCII (BES-III)
  - NICA
  - CEPC
- We have developed the calculation tools:
  - ZFITTER and DIZET for LEP
  - HECTOR for HERA
  - SANC for modern e^+e^- and pp colliders
  - SANCphot ($\gamma\gamma$ collisions)

Theory calculations (II)

ReneSANCe (Renewed SANC Monte Carlo event generator) is a Monte Carlo event generator for simulation of processes at ee and $pp(p\bar{p})$ colliders.

- The following processes are fully implemented:
  - $e^+e^- \to e^-e^+, ZH, \mu^+\mu^-, \tau^+\tau^-, Z\gamma, \gamma\gamma, t\bar{t}$
  - $e^-e^- \to e^-e^-$, $\mu^+\mu^+ \to \mu^+\mu^+$, $\mu^+e^- \to \mu^+e^-$
  - $pp(p\bar{p}) \to \ell^+\ell^- X, \ell^+\nu_\ell X, \ell^-\bar{\nu}_\ell X$
  - $\gamma\gamma \to \gamma\gamma, \gamma Z, ZZ$
- Based on the SANC (Support for Analytic and Numeric Calculations for experiments at colliders) modules
- Complete one-loop and some higher-order electroweak radiative corrections
- All the particle masses and polarizations
- Effectively operates in the collinear region and in wide $\sqrt{s}$ range
- New processes can be easily added

Data analysis

- Our group participated in the experiments:
  - DELPHI (LEP)
  - BES-III (BEPCII)
  - CDF (Tevatron)
  - ATLAS (LHC)
- Our main interests in CEPC:
  - EW physics
  - Higgs physics
  - B-physics
  - Two-photon collisions