

Review on summer scientific school «Super charm-tau factory»

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General information

School venue: National Center of Physics and Math, MSU (Sarov)

Dates: 25.07.2022 – 29.07.2022.

School fee: absent; meals and accommodation are included.

Social program: 2 excursions (Sarov and Diveevo); 2 banquets.

Number of participants: 80 (25 were planned).

Lectures program:

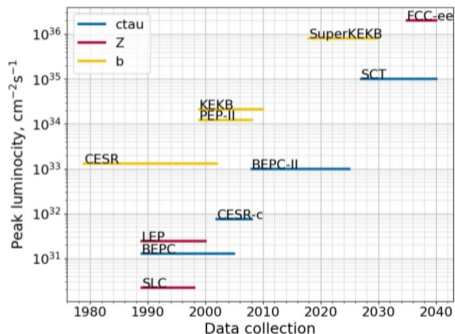
- Super $c - \tau$ factory, RFNC-VNIIEF
 - Tagged gamma-rays: sources and application
 - Introduction to the SM, Beyond the SM
 - b and c quarks physics, τ lepton physics
 - Detectors
 - Accelerators
 - Electronics
 - Data analysis and machine learning
- + reports from participants (optional)

Factories



Previous		PEP-II (USA), KEK-B (Japan)	LEP, LEP-2 (CERN)
Now	BEPC-II (China)		
Future	Super charm-tau factory <i>x100 gain in luminosity</i>	Super KEK-B (Japan), LHCb (CERN)	FCC-ee (CERN), CEPC (China)

Comparing



Today:

LHCb: 5 fb⁻¹

→ x10-60

Tomorrow:

LHCb: 50/300 fb⁻¹ (Run 3/4)

B-factories: 1 ab⁻¹

→ x50

Super KEK-B: 50 ab⁻¹

BES-III: ~100 fb⁻¹

→ x100

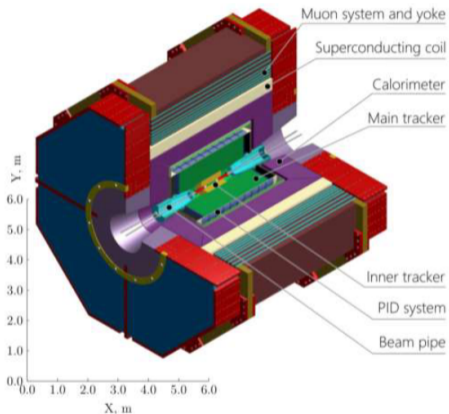
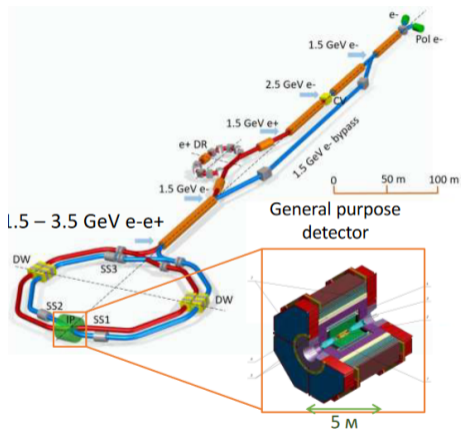
Super C-tau factory: ~10 ab⁻¹

$$\mathcal{L} = 10^{35} \text{ cm}^{-2} \text{ s}^{-1}$$

A one-year dataset

2E, GeV	Events recorded
3.1	10 ¹² J/ψ
3.69	10 ¹¹ ψ(2S)
3.77	10 ⁹ D \bar{D}
4.17	10 ⁸ D _s \bar{D}_s
3.55 ÷ 4.3	10 ¹⁰ τ τ
4.65	10 ⁸ Λ _c ⁺ Λ _c ⁻

Project of accelerator and detector



Not to be confused with Chinese project Super $\tau - c$ factory!