

e^+e^- scattering at BES III

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Particle Physics
Summer 2016



Cluster of Excellence Precision Physics,
Fundamental Interactions and Structure of Matter





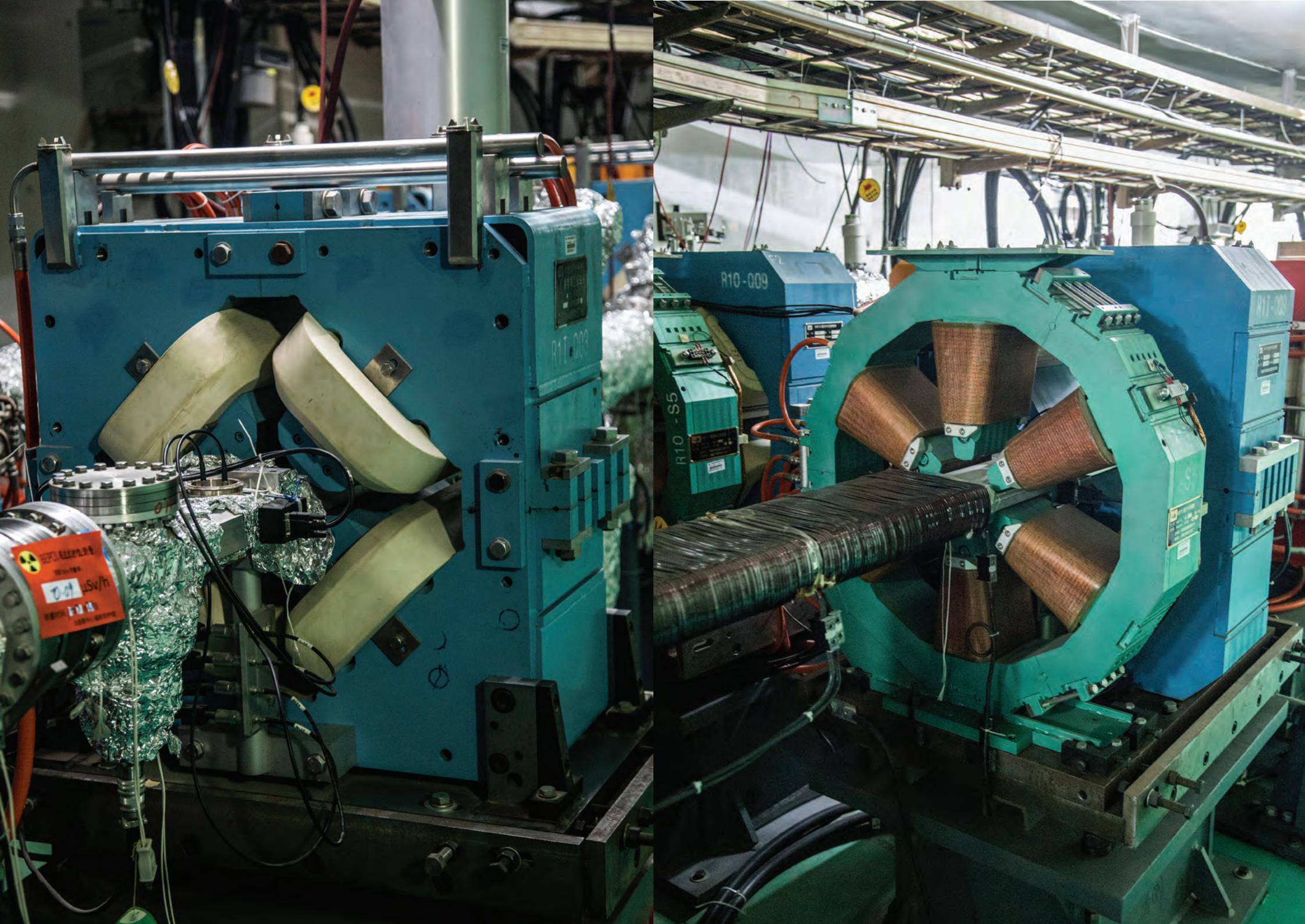


BEPC II









MEGA
INDUSTRIES, LLC

S 19 D

频激励 RF On
发射机开 Klyst
腔冷却 Cavit
高频老炼 Cavit
正常状态 Norm

R20-002

055
054

0.06 μ Sv/h
R2ICH2

R2ICH2

S46E



R300 C T4
F2 F1

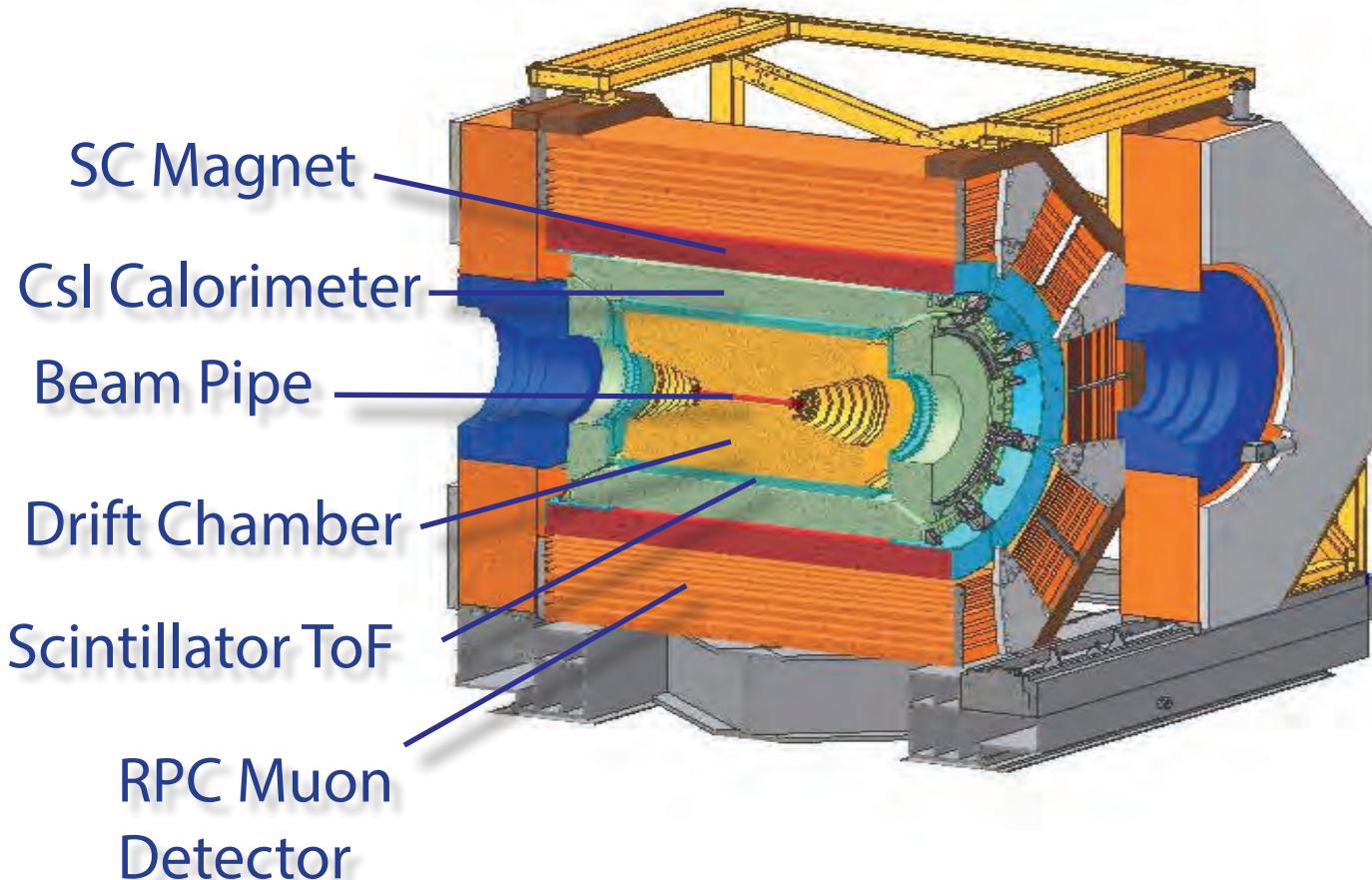


F3





BES III



Excellent tracking and calorimetry:

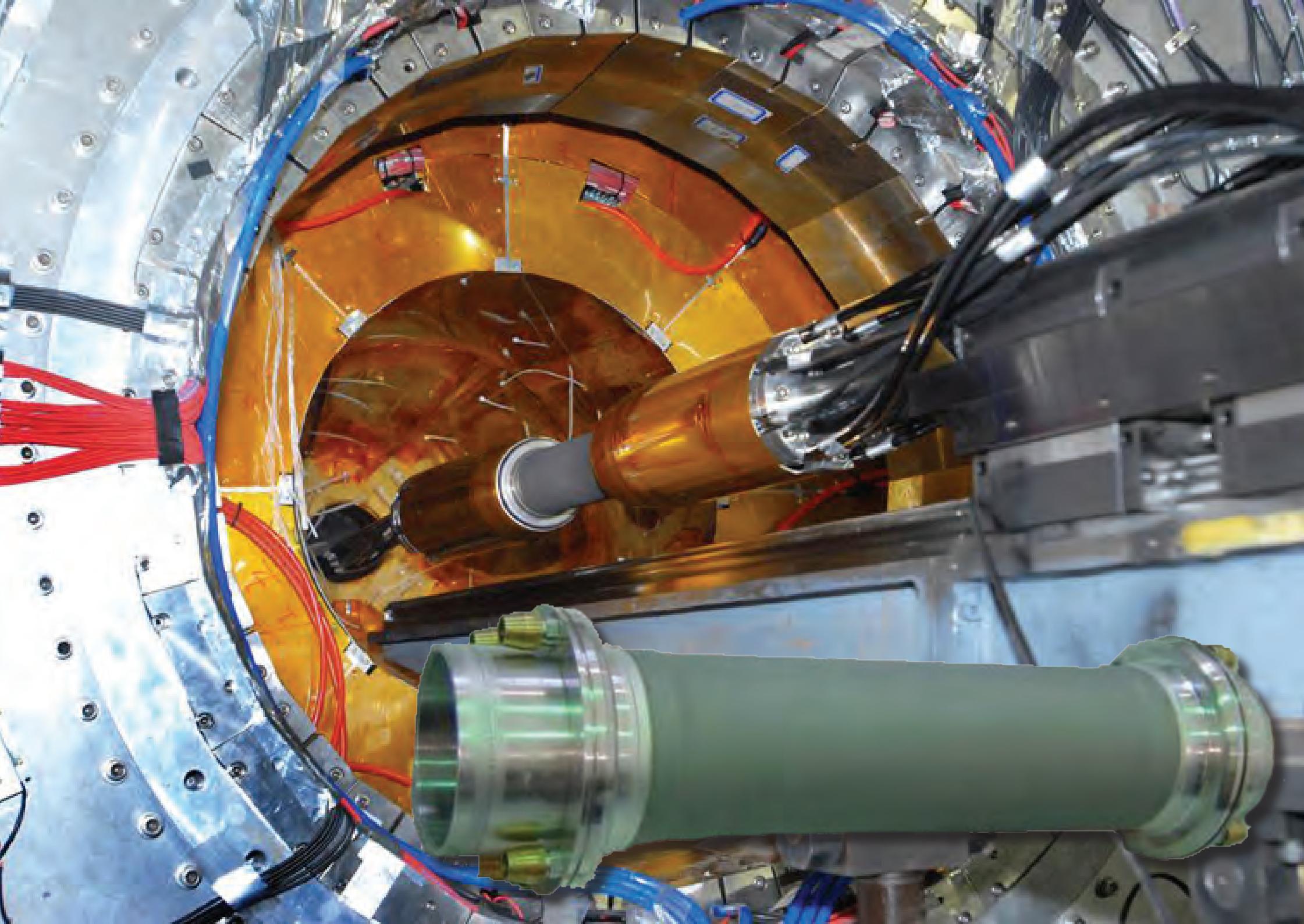
Tracks:

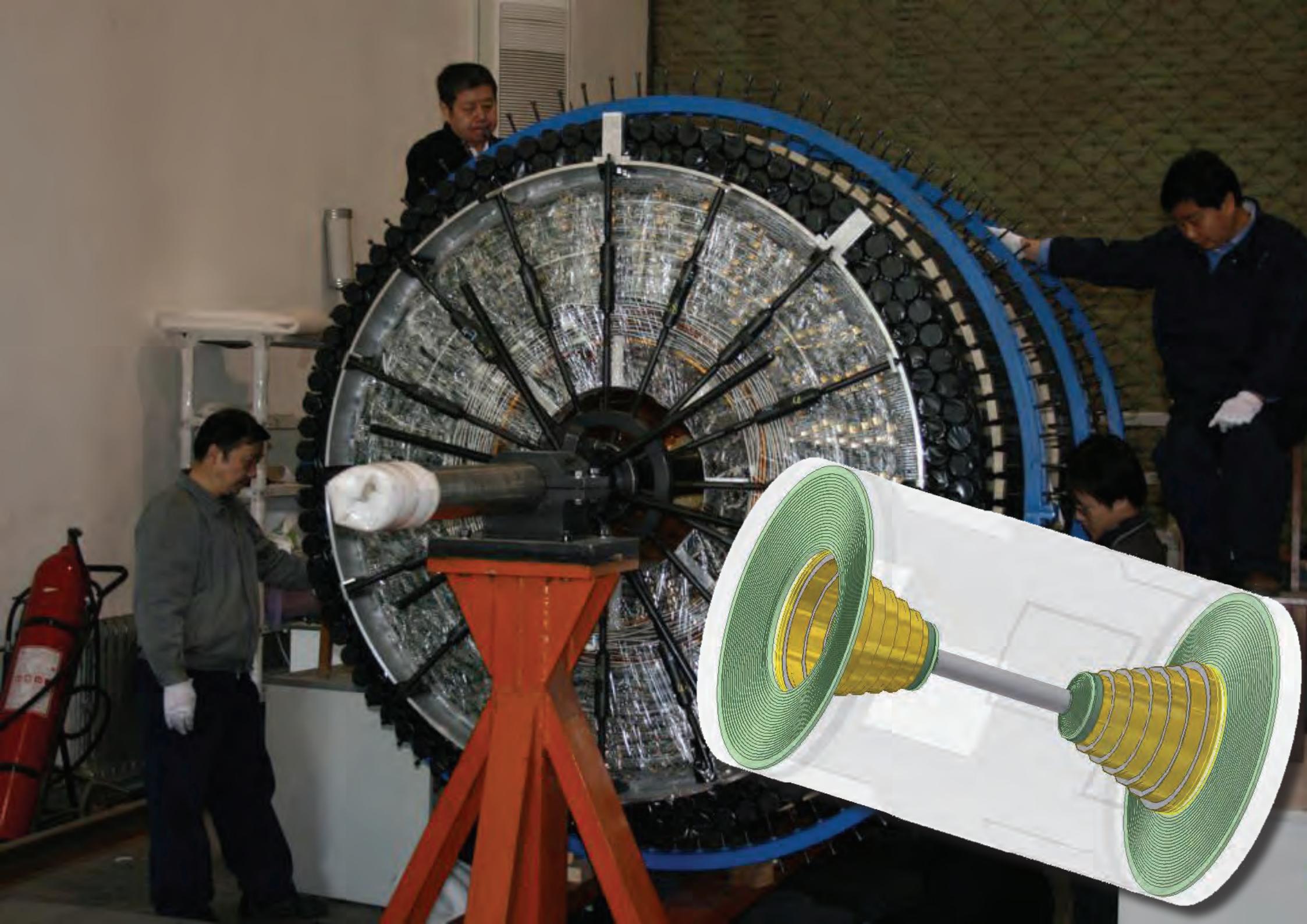
$$\sigma_p/p = 0.58\% \text{ @ } 1 \text{ GeV}/c$$

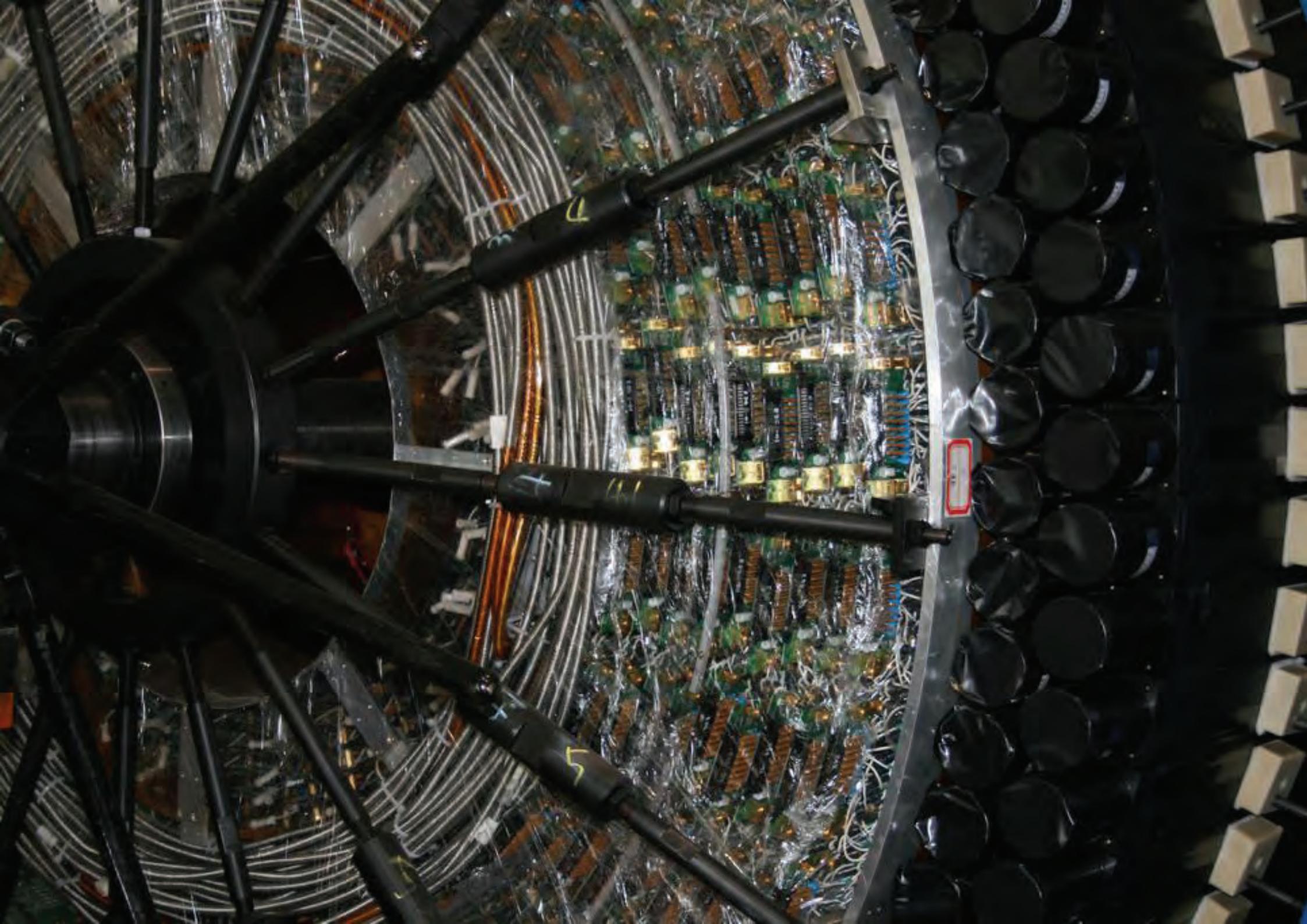
Photons:

$$\sigma_E/E = 2.5\% \text{ @ } 1 \text{ GeV}$$

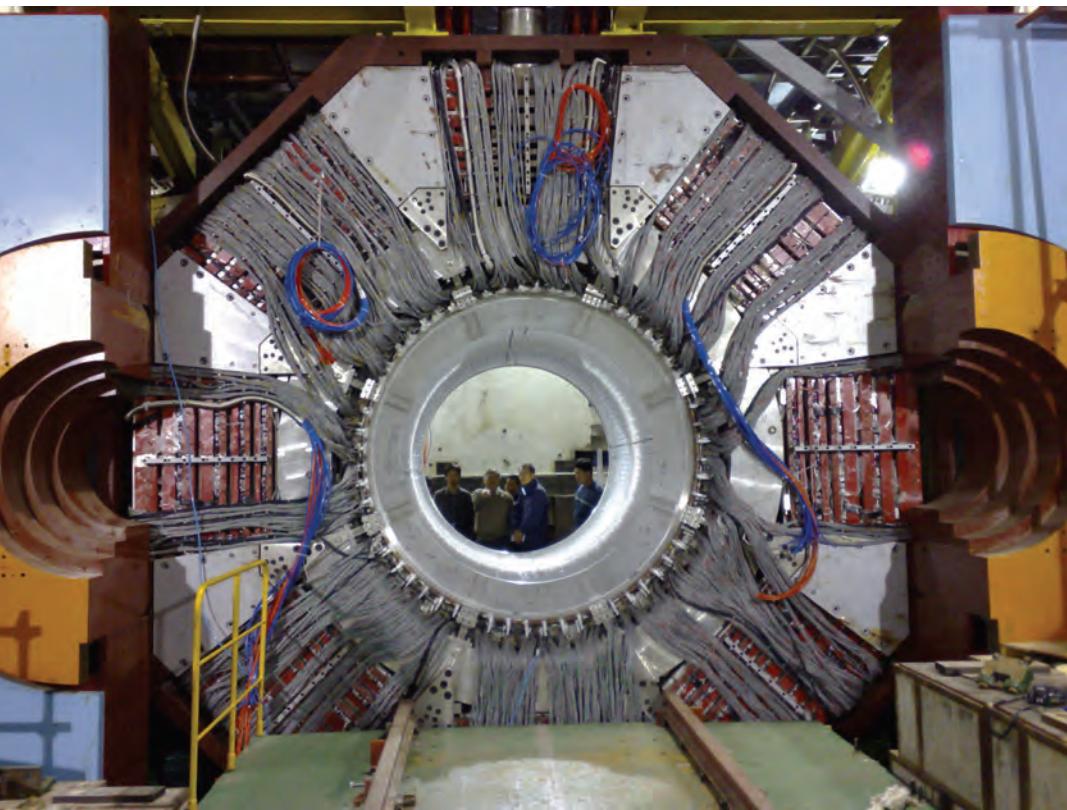
Read-out at up to 6 KHz











China

HongKong,
China

Germany

Italy

Japan

Republic of
Korea

Netherlands



Russia



U.S.A.





Overview



Produce lots of
charmonium states

BEPC II Accelerator



Overview

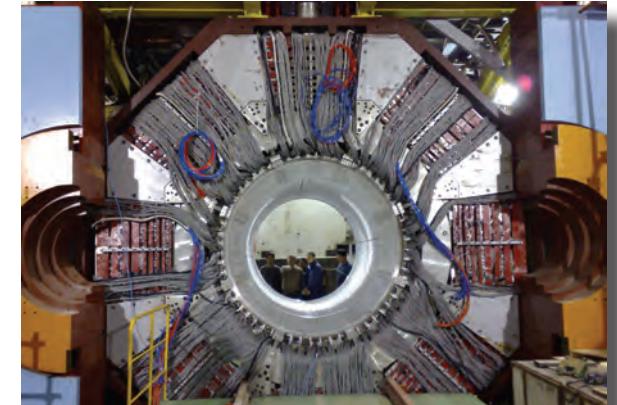


BEPC II Accelerator

Produce lots of
charmonium states



Detect their decay
products



BES III Detector



Overview

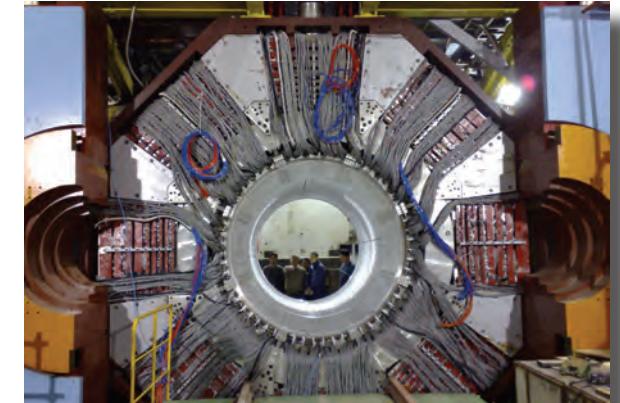


BEPC II Accelerator

Produce lots of charmonium states

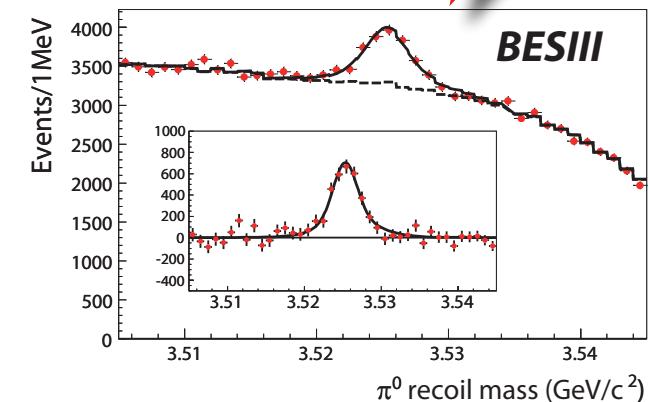


Detect their decay products



BES III Detector

Study their properties

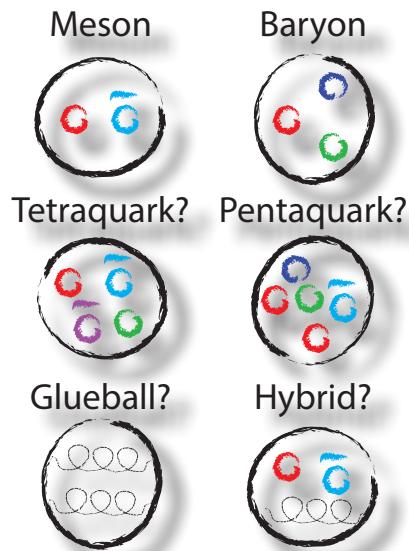




Overview



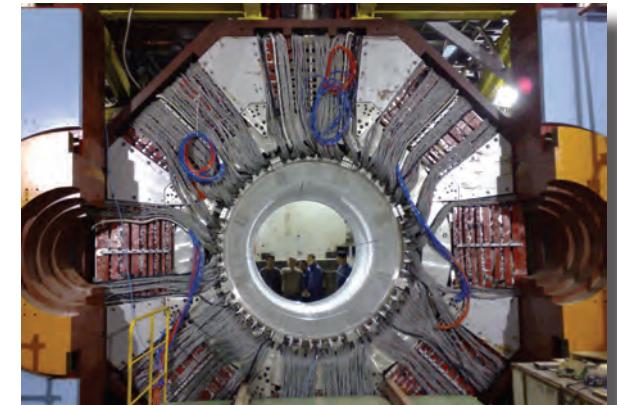
BEPC II Accelerator



Produce lots of charmonium states



Detect their decay products

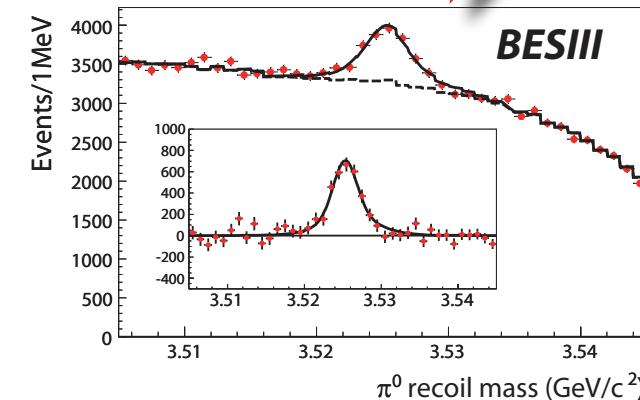


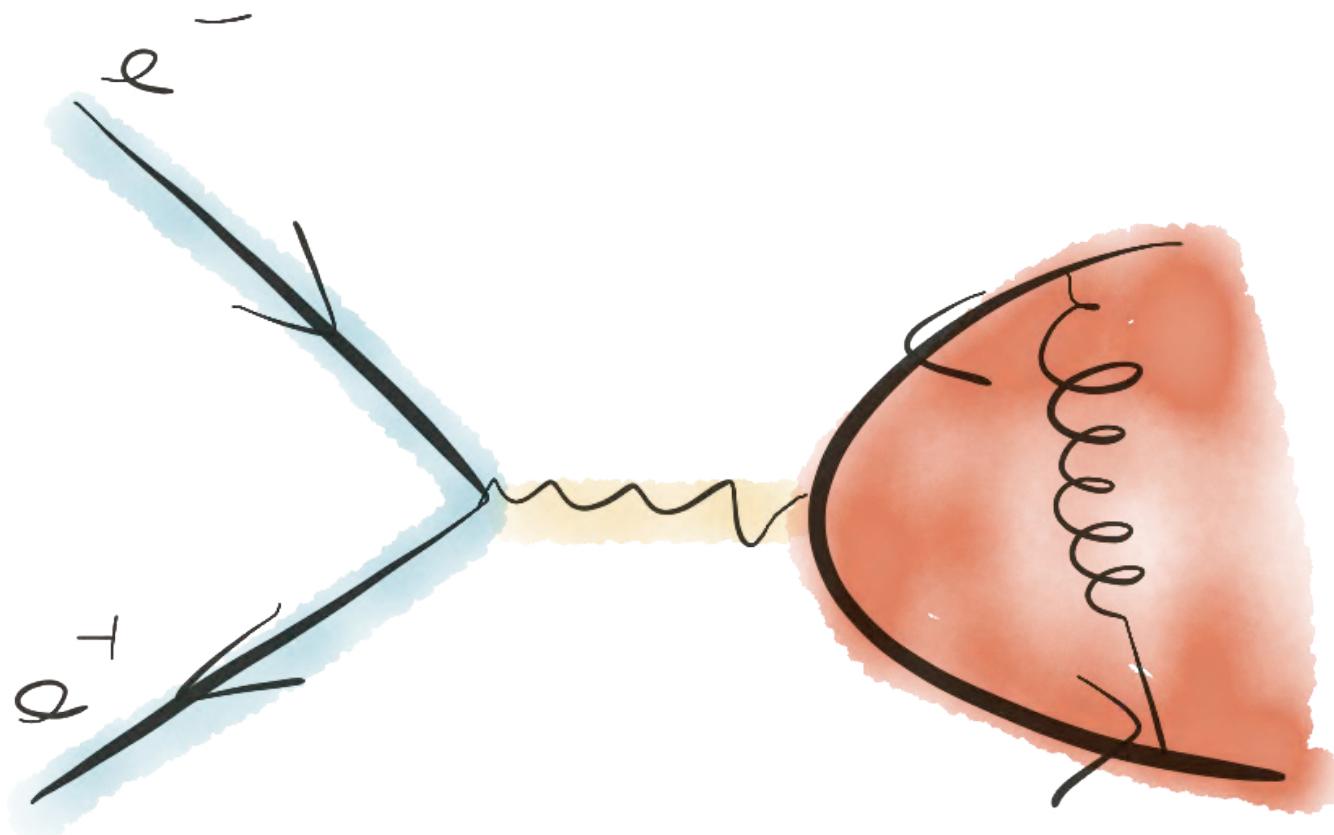
BES III Detector

Study their properties



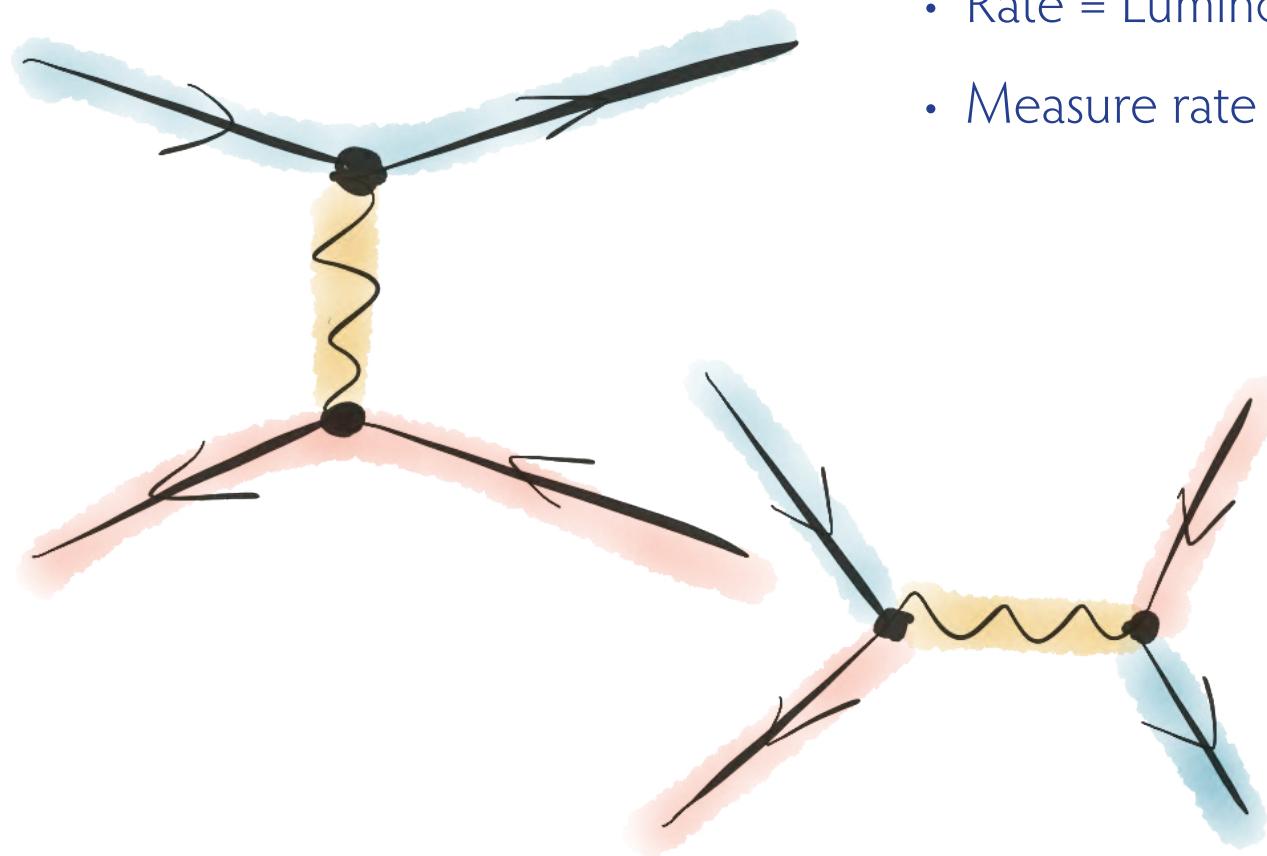
Learn about QCD and its bound states







Luminosity measurement using Bhabha scattering



- $e^+e^- \rightarrow e^+e^-$
- Cross-section well known
- Rate = Luminosity $\times \sigma$
- Measure rate

