54th International Winter Meeting on Nuclear Physics
Bormio, 25-29 January 2015

Progress in Light Hadron Spectroscopy

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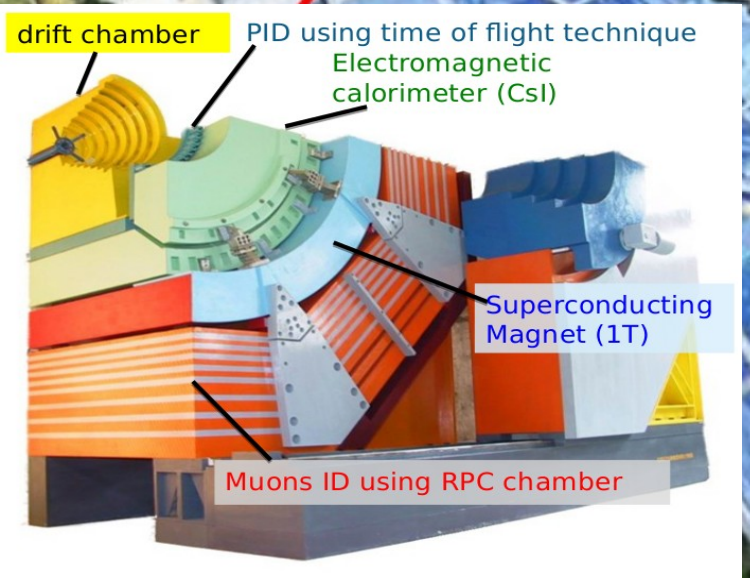
On behalf of BESIII collaboration

Bird view of BEPCII

Linac

Storage ring

2004: start construction
2008: test run
2009-now: data taking



BESIII physics

- Charmonium(-like) physics
- Light hadron spectroscopy
- Charm physics
- τ physics

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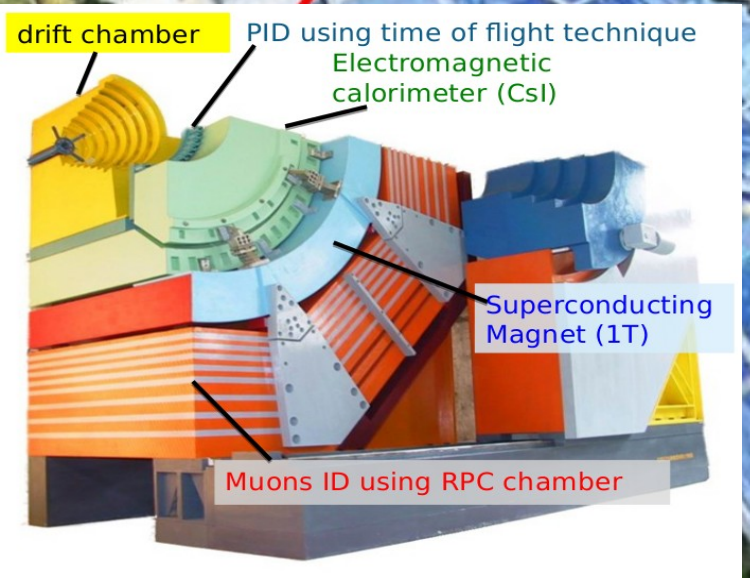

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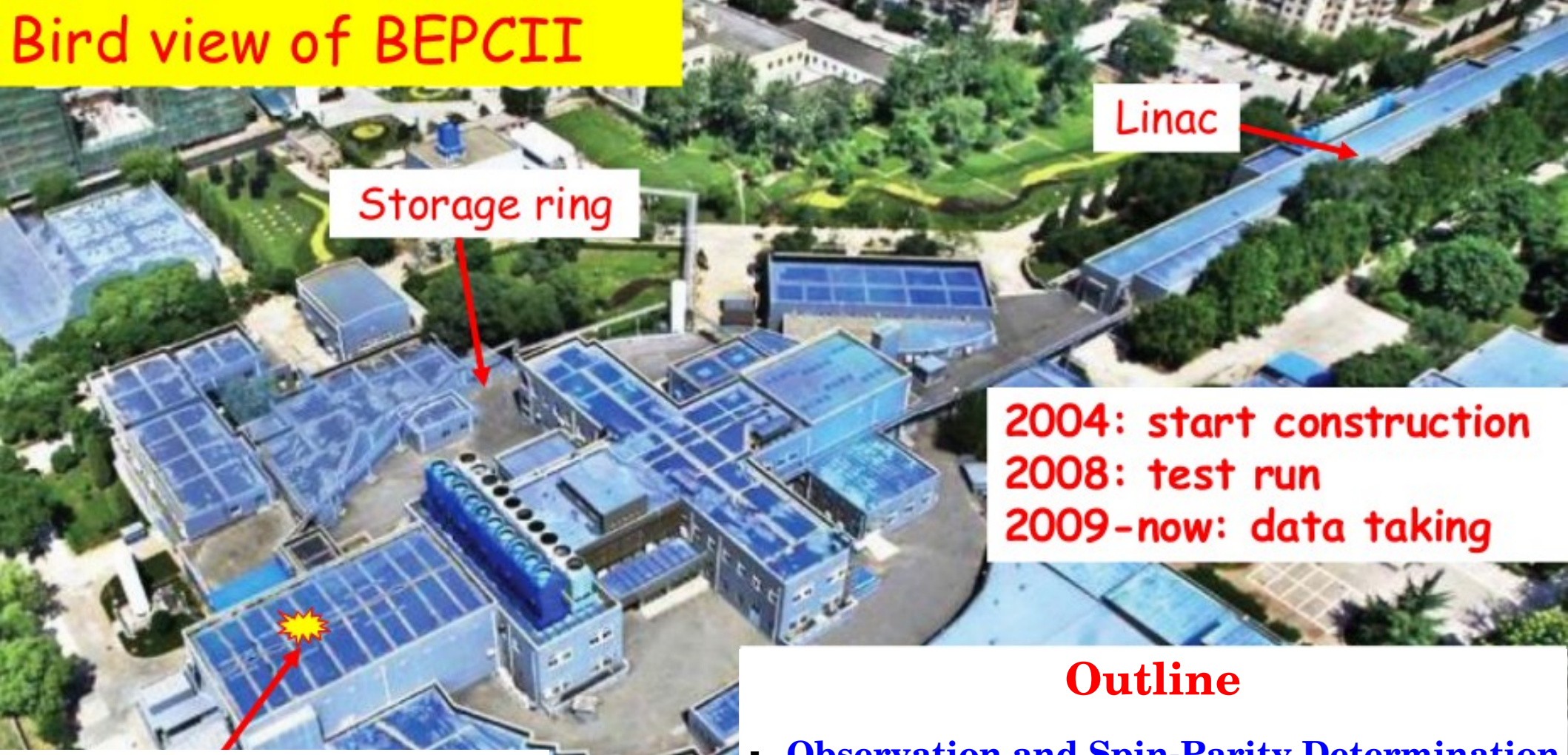

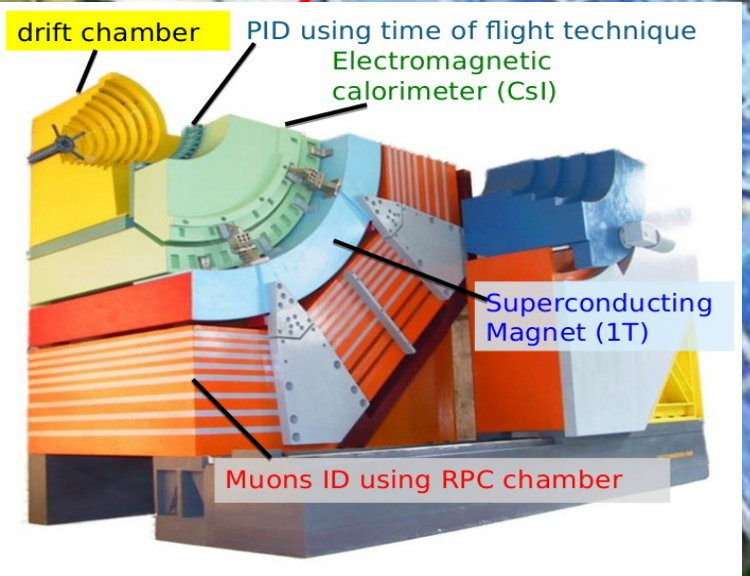

Outline

- **Observation and Spin-Parity Determination of the X(1835) in $J/\psi \to \gamma K^0_S K^0_S \eta$**
- **Amplitude analysis of the $\pi^0\pi^0$ system produced in radiative J/ψ decays**
- **Study of $\eta' \to \gamma \pi^+\pi^-$ decay dynamics**
- **Measurements of $\psi(3686) \to K^-\Lambda\Xi^+ + c.c.$ and $\psi(3686) \to \gamma K^-\Lambda\Xi^+ + c.c.$**

PWA in ππ systems

Hystorically:

- Charged, rather neutral
- Model dependent analyses (Breit-Wigner)
- Parametrization of ππ scattering amplitude

This time, study of small regions of ππ invariant mass

First model indipendent analysis!

$\eta' \to \gamma\pi^+\pi^-$ decay

- Extensive experimental and theoretical efforts dedicated
- Is the reaction $\eta' \to \gamma\rho^0$, $\rho^0 \to \pi^+\pi^-$ the whole story?
- Two different parametrization may allow to deepen our knowledge

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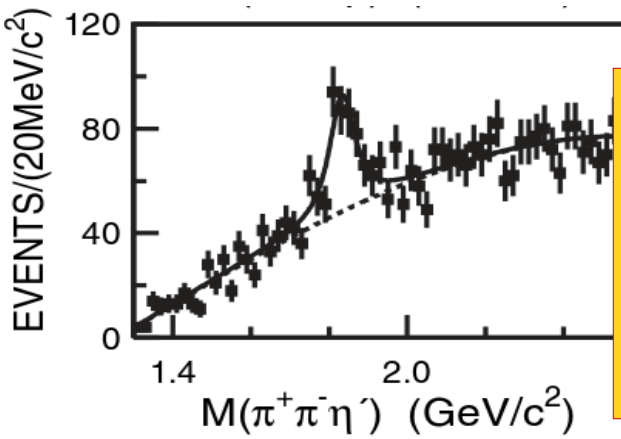
Ξ^* systems in baryon spectroscopy

- Only 11 $\Xi*$ states discovered
  - Most $\Xi*$ hyperon results have limited statistics
- Studying charmonium decay opens new possibilities (high statistics/low background vs limited phase space)
- Precise measurements can clarify decay mechanism

X(1835)

Firstly observed in BESII:

PRL 95, 262001 (2005)



Glueball?
$p\bar{p}$ bound state??
η second radial excitation??

Spin-Parity?

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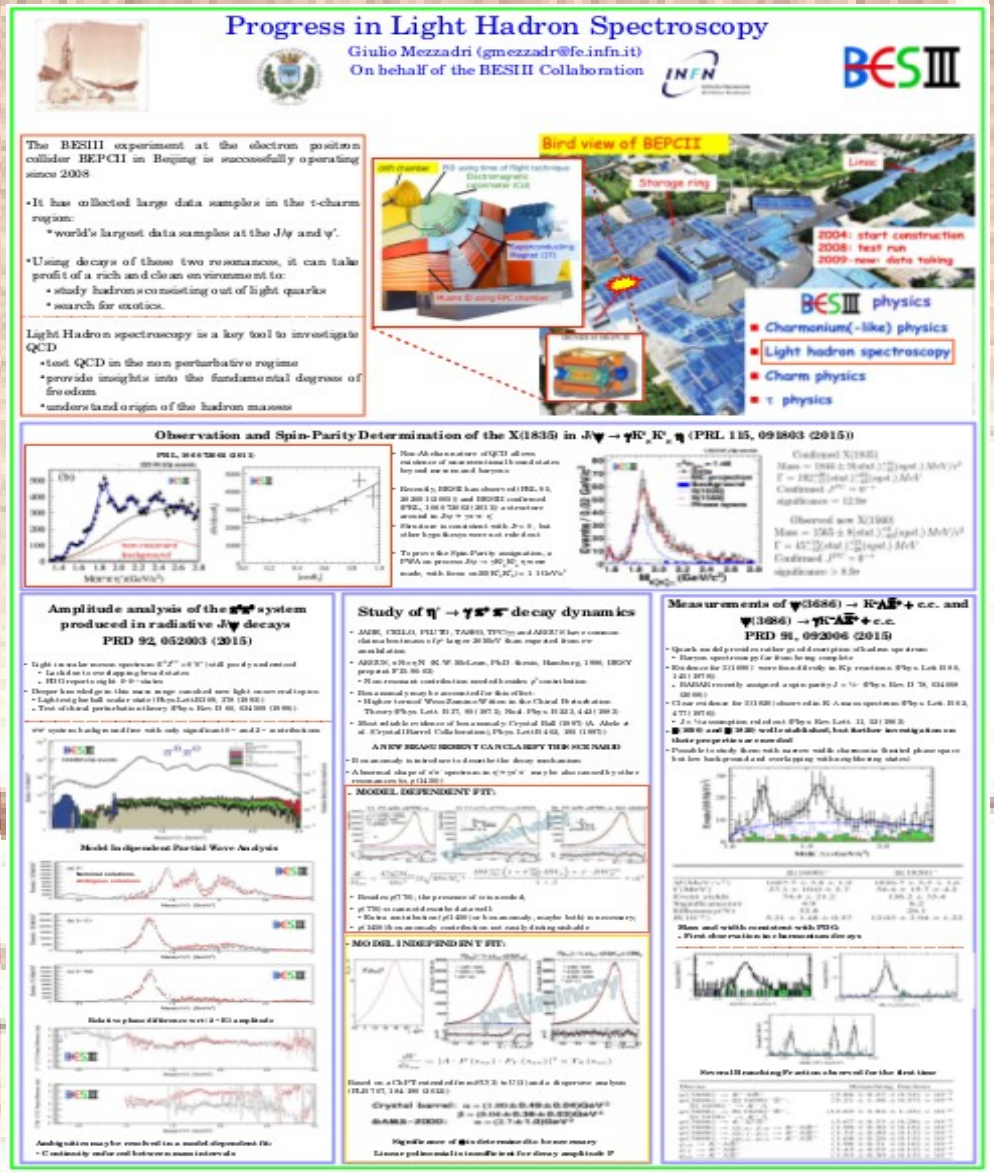
Thanks for the attention!



HOPE TO SEE YOU AT MY POSTER!