

# Polarization of charmed baryons at Belle II

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Flash talk  
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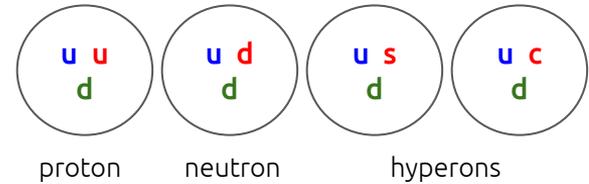
# Standard Model challenges

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Despite the it is the best tested theory of nature, many puzzles in modern physics are related to the limitation of the SM.

Answers can be searched:

- Within SM:
  - quantitative description of the nucleon
  - replace light quarks with heavier ones (c, s)**



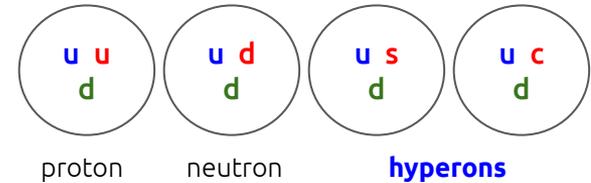
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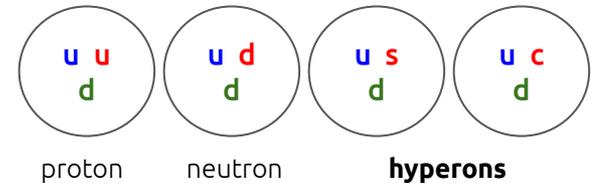
- Beyond SM:  
→ neutrino oscillations, dark matter,  
matter-antimatter asymmetry  
**high energy frontier**  
**intensity frontier**

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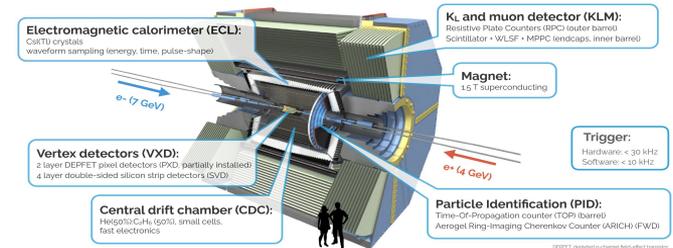
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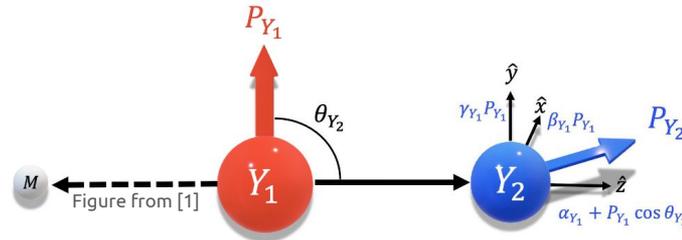
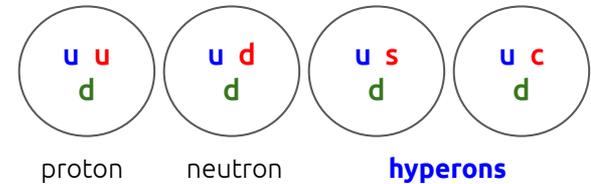
unprecedented instantaneous luminosity:  
 $4.7 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$

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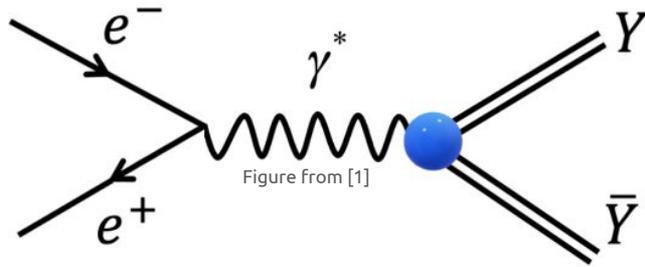
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Hyperons offer an advantage w.r.t. nucleons because they decay weakly  
→ **the polarization of the hyperon is accessible via the angular distribution of the daughter baryon**

[1] K. Schönning, V. Batozskaya, P. Adlarson, X. Zhou, CSC 47(5) (2023)052002

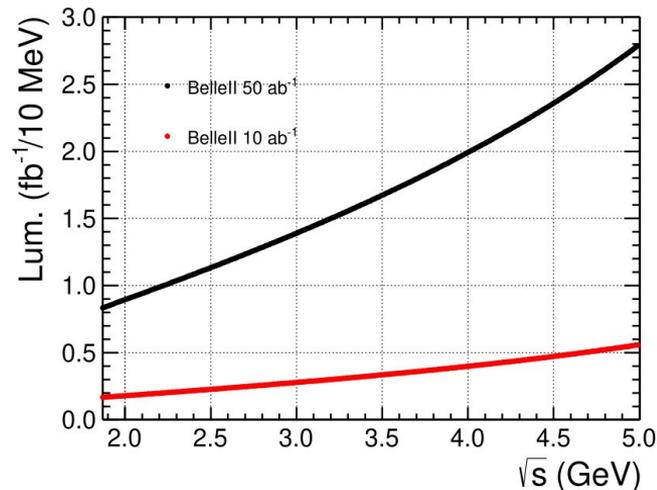
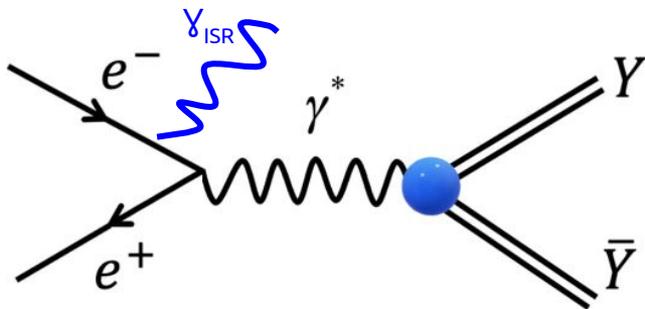
# Time-like FFs



- time-like form factor **accessible in the annihilation process**
- joint angular distribution of production and decay gives access to the complex form factors  $G_E(q^2)$  and  $G_M(q^2)$  including their relative phase  $\Delta\Phi$
- **manifests in a polarized final state, even if colliding beams are unpolarized**

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# Polarization of charmed baryons at Belle II



- Belle II enables high-precision structure studies of strange and charmed hyperons through the ISR technique
  - better statistical precision
  - reduce systematic uncertainties exploiting the richness of the angular distributions

*Thank you!*

