

Polarization of charmed baryons at Belle II

Flash talk
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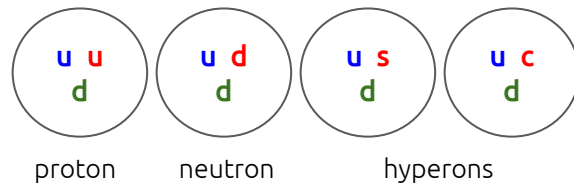


Standard Model challenges

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)**

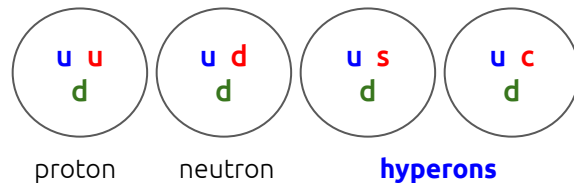


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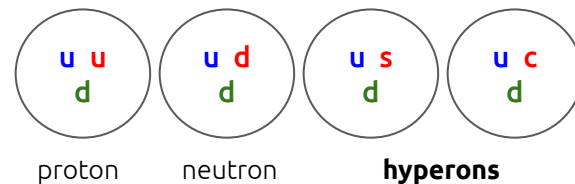
- Beyond SM:
 - neutrino oscillations, dark matter, matter-antimatter asymmetry
 - high energy frontier**
 - intensity frontier**

Standard Model challenges

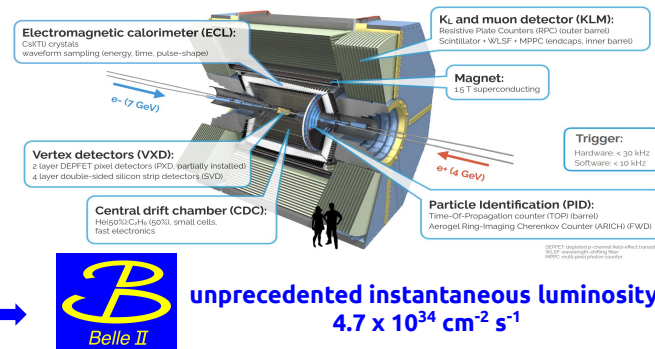
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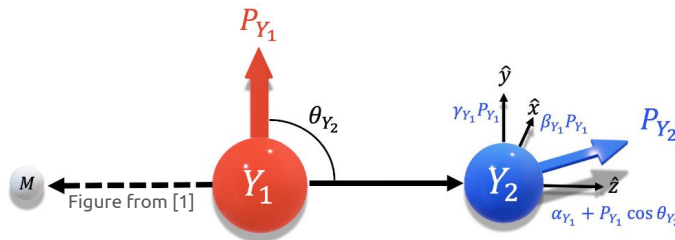
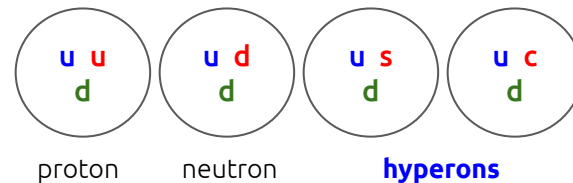


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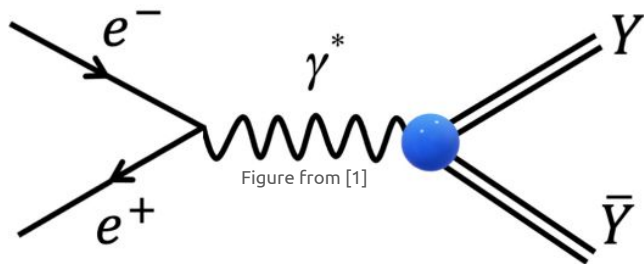
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Hyperons offer an advantage w.r.t. nucleons because they decay weakly
→ **the polarization of the hyperon is accessible via the angular distribution of the daughter baryon**

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

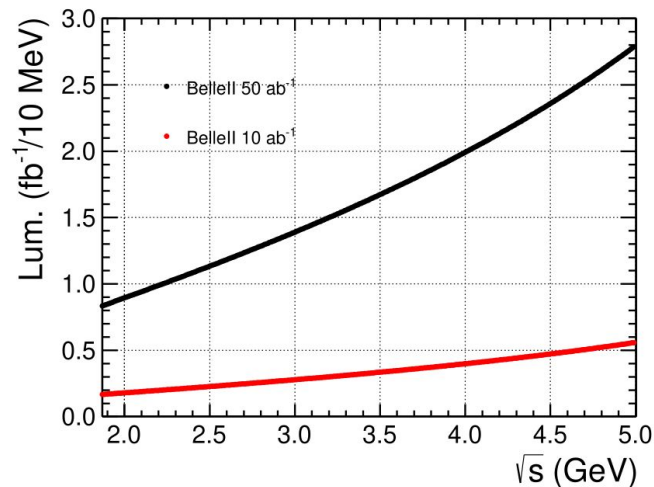
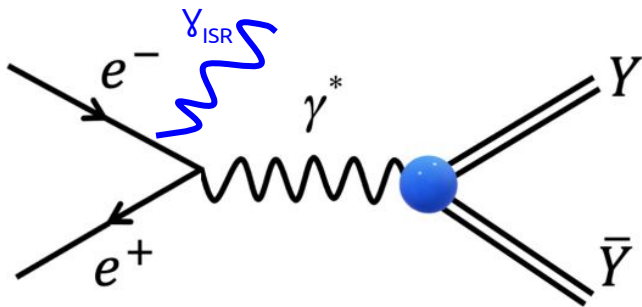
Time-like FFs



- 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!

