Open questions on double parton scattering (from an experimental point of view)

Jonathan Gaunt, Paolo Gunnellini
Many interesting experimental talks:

- DPS in same sign WW at the CMS experiment
  → Diego Ciangottini

- DPS measurements at the CMS experiment
  → Paolo Gunnellini

- Studies of double parton interactions with the ATLAS detector
  → Orel Gueta

- Study of DPS processes at LHCb
  → Vanya Belyaev

N.B. 20 + 5 min. for each talk!

Prospects for the future:

1. DPS energy dependence
2. New sensitive channels?
3. New sensitive observables?
4. New phase space?

N.B. Very personal and (CMS-) biased view!
Is this not a clear evidence of DPS?

**ATLAS - CMS:** DPS fraction 5-8%
→ Diff. cross sections of DPS-sensitive observables

**LHCb:** DPS fraction 60 - 90%
→ Total production cross section for sensitive channels
Investigation of sensitive channels (same-sign WW, J/ψ+D,Λ)
Analysis cuts which increase DPS sensitivity
Currently, measurements scan different (and complementary) regions of phase space
Experimental strategy for DPS measurements (II)

1st step
Corrected distributions
DPS-sensitive variables

2nd step
Data interpretation and unambiguous definition of signal and background templates

3rd step
Extraction of the DPS fraction and study of the process dependence

- Compare the data to your own favourite predictions!

4th (future) step: possibility to measure sensitive corners of phase space

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Role of the quantity $\sigma_{\text{eff}}$

- Is the value for $\sigma_{\text{eff}}$ a useful input?
- How can one reduce the exp. unc.?
- Should one try also a global extraction?

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![Graph showing the relationship between $\sqrt{s}$ and $\sigma_{\text{eff}}$.](image)
We hope we will have a very fruitful discussion!