(Partial) Summary of DPS experimental session

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Many measurements available by all experiments and differential distributions available

For DPS extraction, mainly the different topology of SPS and DPS events is investigated: pT balance, $\Delta \Phi$, $\Delta S$...

Can we find more observables?
In order to extract the DPS contribution, need for a reliable SPS background definition DPS signal is affected by that!

First 13 TeV results!!

DPS contribution

\[ \sigma_{\text{eff}} \text{ comp. with 14.5 mb} \]
Sigma effective is always (strongly) model (Monte Carlo) dependent!!!

\[ \sigma_{\text{eff}} \approx 11 \text{ mb} \] (if P8 considered)

\[ \sigma_{\text{eff}} \approx 20 \text{ mb} \] (if MG + P8 considered)
More pure channels!

So far not enough statistics but very promising for Run II

$\sigma_{\text{eff}} > 5.3 \text{ mb}$

$\sigma_{\text{eff}} > 5.91 \text{ mb}$

$\sqrt{s} = 8 \text{ TeV}, 20.3 \text{ fb}^{-1}$

$pp \rightarrow \text{prompt } J/\psi + Z$

Data

Double Parton Scattering

Pileup

Pileup and DPS Uncertainty

CMS Preliminary, $pp \rightarrow l^+ l^- \gamma$ at $\sqrt{s} = 8 \text{ TeV}$
Experimental challenge is indeed to reduce the uncertainties...but this comes from $\sigma_{\text{eff}}$ extraction, not always from the data.

One should agree on a value of $\sigma_{\text{eff}}$ to be used in measurements: perhaps the one measured at 7 or 13 TeV (and not the CDF result).

Very important that the differential Measured distributions are released in RIVET!
Questions

• Need for new observables, sensitive to DPS for “old” and “new” channels?

• Triple parton scattering: is that realistic? Which channels can one use?

• Which data would be necessary to extract DPDs?

• Current statistics makes double differential cross sections feasible (in different x regimes, particle multiplicities, other?)