

Yellow Report: status of chapter 4

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Content (wish list)

- SD JJ
- SD W
- SD Z
- SD γ + jet (?)
- SD JGJ (?)
- DPE JJ
- DPE γ + jet
- DPE JGJ
- DPE W
- DPE Z

Content

- **Motivation**
news / interesting aspects from theory point of view are welcome!
e.g. $c\bar{c}$ production
- **Results from LHC experiments** (if public).
e.g. ATLAS and CMS results on SD JJ production
- **Predictions for the future LHC runs.**

News

- From CMS-TOTEM side main progress wrt last meeting is **Monte Carlo studies on single diffractive production** – final approval yesterday!
- Not yet corresponding text but will come by next meeting
- At next meeting also detailed presentation. **A few words in the following slides**

Ingredients

Special optics $\beta^* = 90$ m

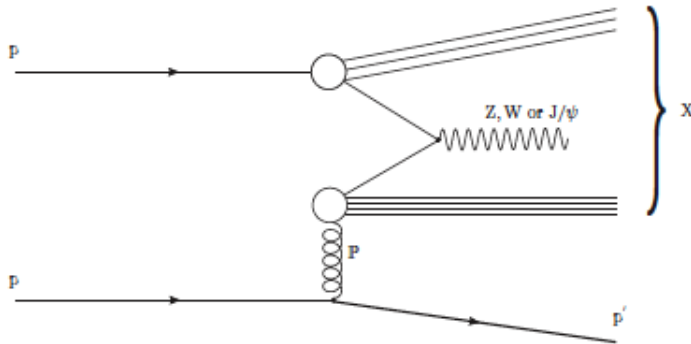
β^* [m]	crossing angle [μ rad]	ϵ_N [μ m rad]	N [10^{11}]	k [bunches]	μ	Luminosity
90	0	2	[0.5 - 1.5]	156	[0.06 - 0.5]	[0.1 - 1] pb ⁻¹ /24h
90	100	2	[0.5 - 1.5]	1000	[0.06 - 0.5]	[0.8 - 7] pb ⁻¹ /24h

CMS+TOTEM Roman Pot tag

Studies supportive to the request of special run optics configuration

Single diffractive W production

Detection of 1 proton on either η sides with TOTEM Roman Pots
 Central Detectors (charged tracks, MET, leptons)

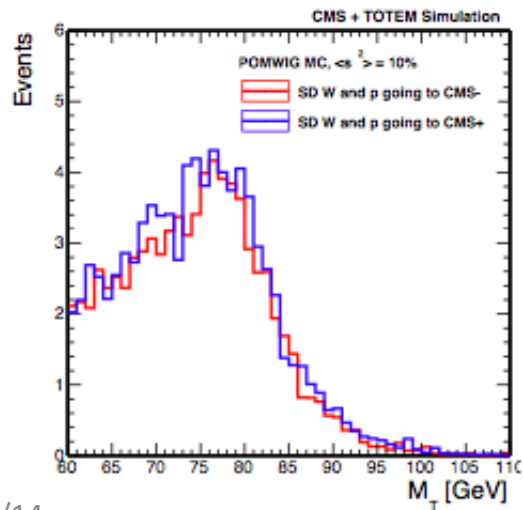


Leading lepton $p_T > 20$ GeV and MET $p_T > 20$ GeV
 $|\eta| < 2.5$
 Leading lepton isolation cuts

σ_{vis} (generator) ~ 131 pb
 $\langle S^2 \rangle \sim 10\%$

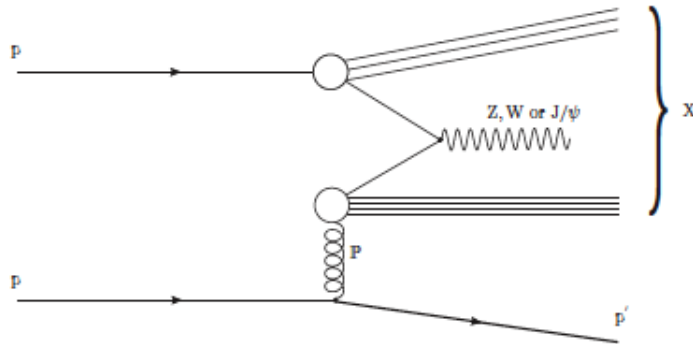
$60 < (M_T)^{||} < 110$ GeV

$L_{int} = 10 \text{ pb}^{-1}$ $N_{ev} \sim 340 \pm 10$



Single diffractive Z production

Detection of 1 proton on either η sides with TOTEM Roman Pots
 Central Detectors (charged tracks, leptons)

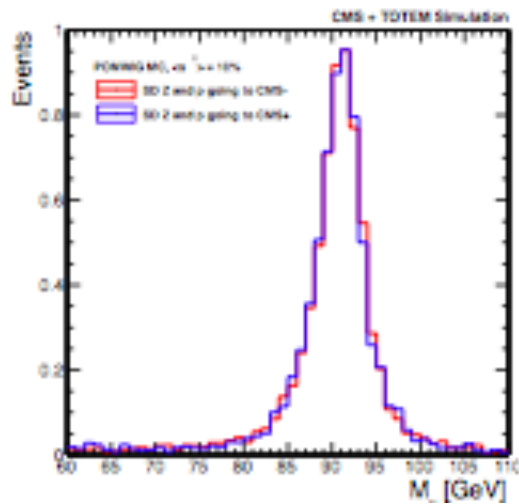


Leading leptons $p_T > 20$ GeV
 $|\eta| < 2.5$
 Lepton isolation cuts

σ_{vis} (generator) ~ 12.1 pb
 $\langle S^2 \rangle \sim 10\%$

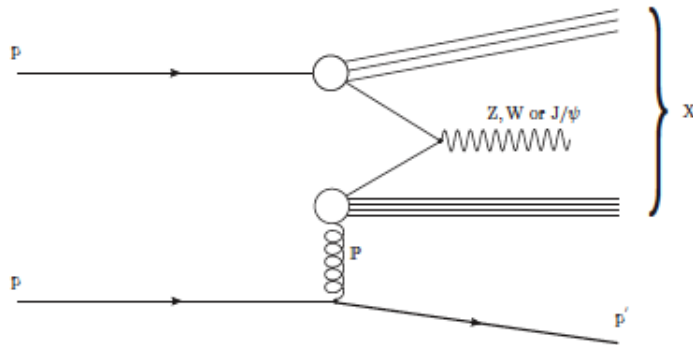
$60 < M_{\parallel} < 110$ GeV

$L_{\text{int}} = 10 \text{ pb}^{-1}$ $N_{\text{ev}} \sim 30 \pm 1$

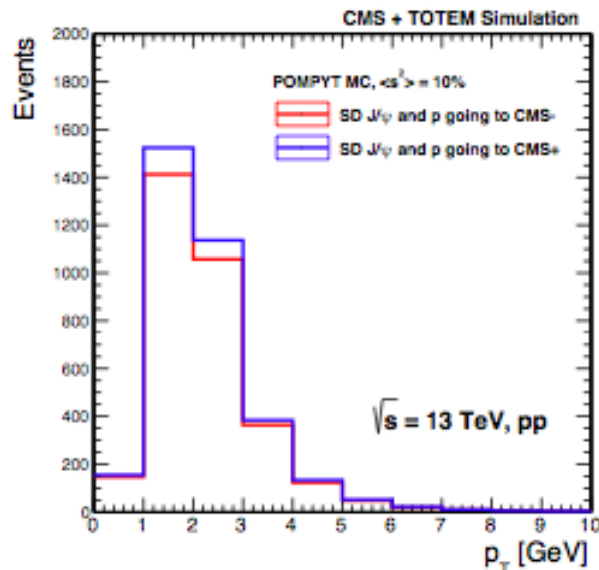


Single diffractive J/psi production

Detection of 1 proton on either η sides with TOTEM Roman Pots
 Central Detectors (charged tracks, leptons)



Two muons with opposite charge with $|\eta| < 2.45$



σ_{vis} (generator) ~ 5.2 nb
 $\langle S^2 \rangle \sim 10\%$

$3.05 < M_{\mu\mu} < 3.15$ GeV

$L_{\text{int}} = 10 \text{ pb}^{-1}$ $N_{\text{ev}} \sim 3080 \pm 90$