Low Mass Drell-Yan Status Report

Marcin Chrząszcz
Katharina Müeller
Nicola Chiapolini

University of Zurich[UZH]

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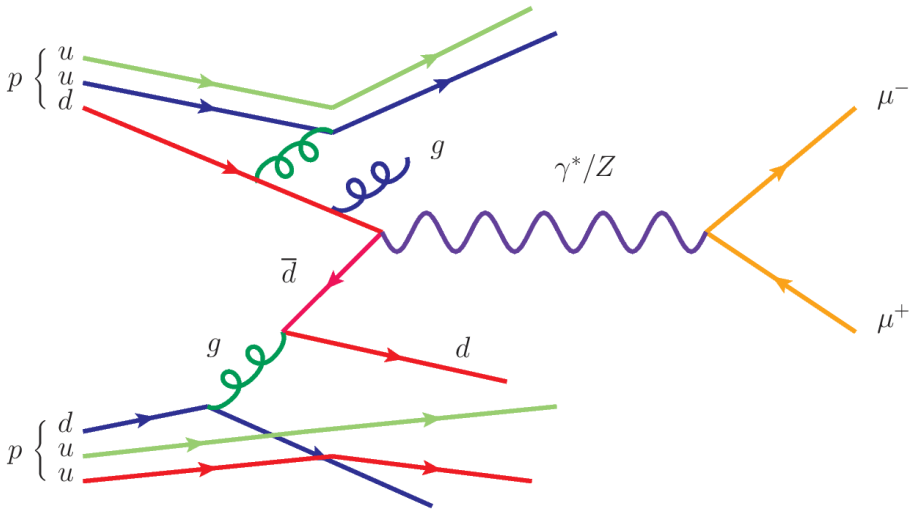
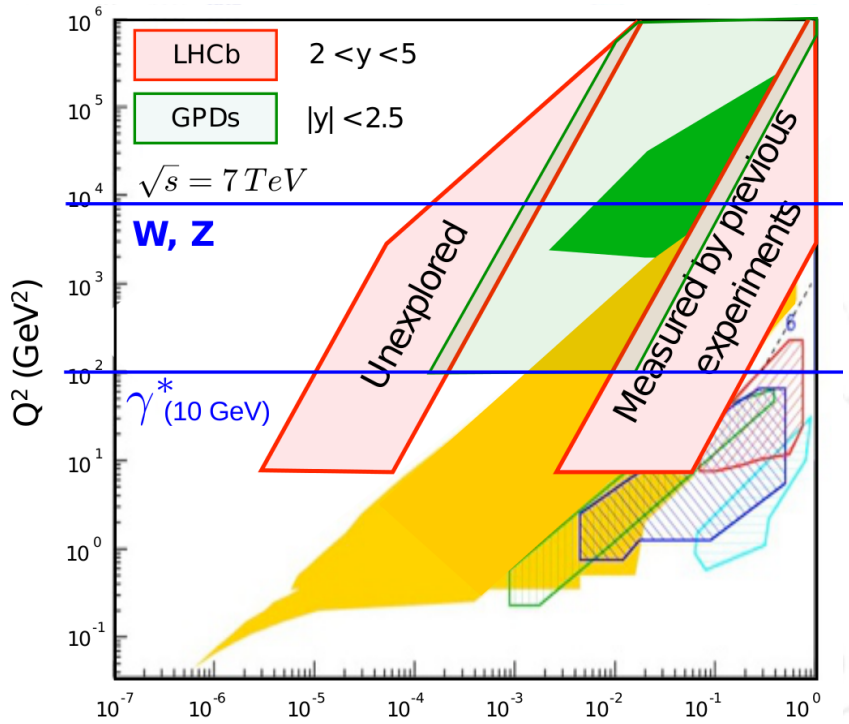
Introduction to Drell-Yan

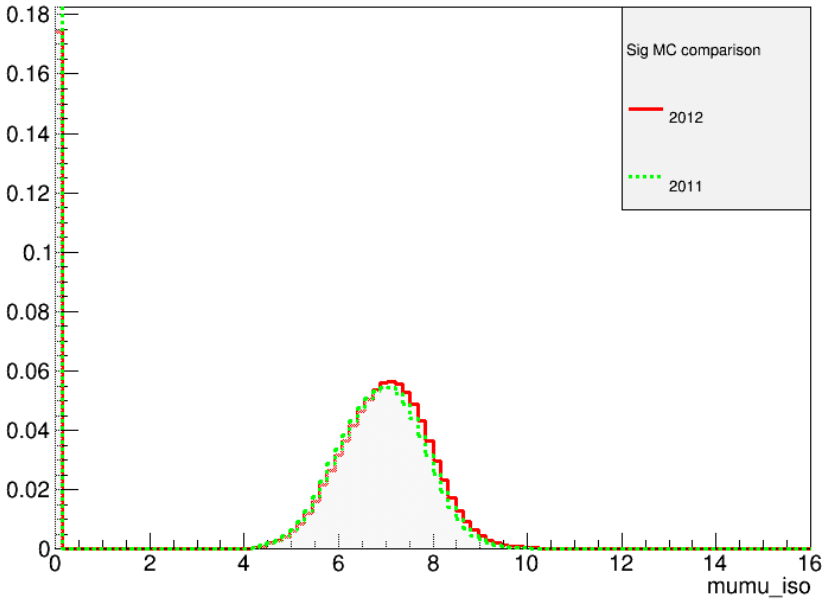
- Drell-Yan are process of two quark anihilations in which neutral current couples to two leptons.
- The cross section of this process depends on two components:
  - Hard scattering process $\Rrightarrow$ NNLO pQCD.
  - Parton Distribution Function (PDF).
- Measurement of the cross section have a high sensitivity to the PDF
- Due to unique coverage $2 < y < 5$ LHCb probes the $Q^2 - x$ region not covered by other experiments.

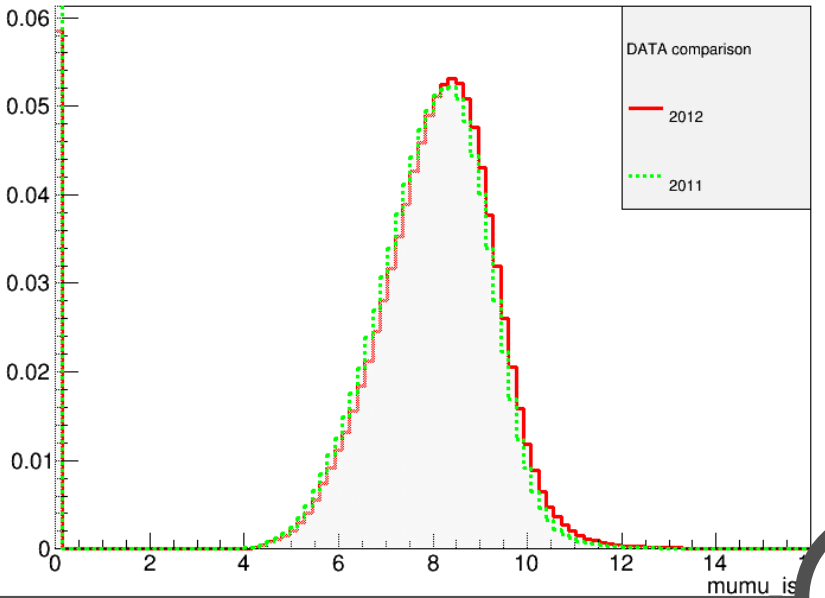




Selection

- Analysis moved to stripping 20.
- Plan is to measure separately $7\ \mathrm{TeV}$ and $8\ \mathrm{TeV}$ data.
- In addition we will provide the ratio of both samples), where many systematic cancel.
- Overall observed a good agreement between 2011 and 2012 data.
- Requested large MC sample to reduce the systematics errors.
- Analysis aims at DIS 2016.





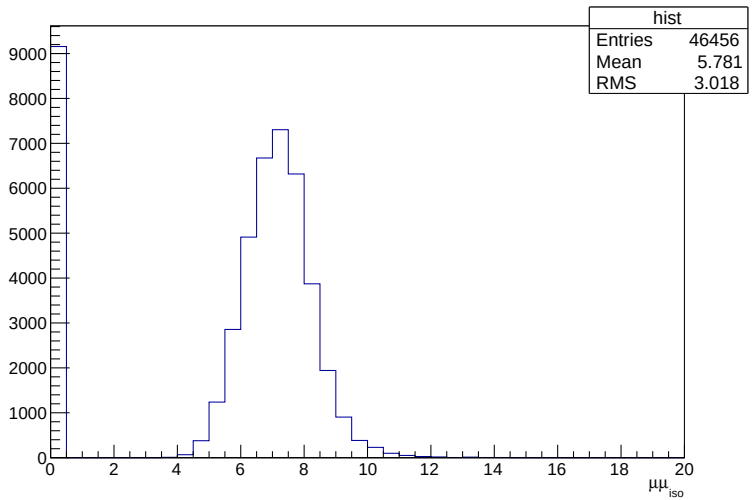
Isolation

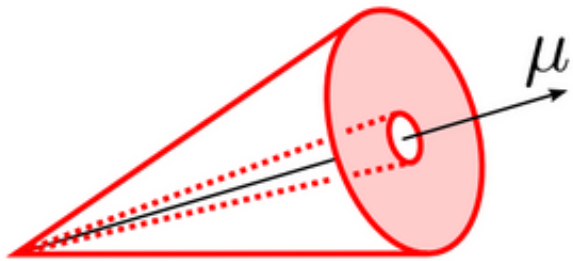
- Drell-Yan unfortunately do not peak in mass $\twoheadrightarrow$ need another variable to control the purity.
- Find mass independent isolation variable such that the signal template can be determined from data.
- We define an isolation variable:

$$\mu_{\text{iso}} = \log(p_T^{cone}(\mu, 0.5) - p_T^{cone}(\mu, 0.1))$$

- For two muons we take the maximum of the two isolations:

$$\mu\mu_{\text{iso}} = \max(\mu_{\text{iso}}^{+}, \mu_{\text{iso}}^{-})$$





Conclusions

- Analysis strategy finalized.
- Aim: DIS 2016
- Early 2016: WG sign off.

Backup