

Low Mass Drell-Yan Status Report



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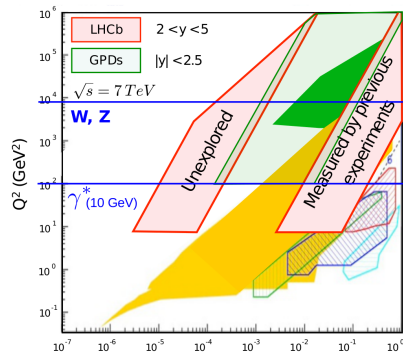
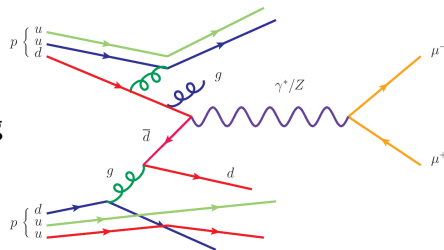


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Introduction to Drell-Yan

- Drell-Yan are process of two quark annihilations in which neutral coupling to two leptons.
- The cross section of this process depends on two components:
 - Hard scattering process \Rightarrow 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.



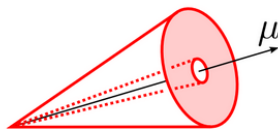
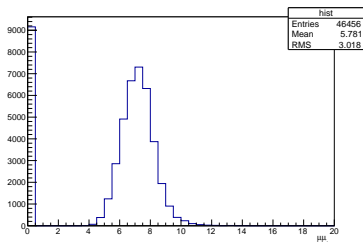
Isolation

- Drell-Yan unfortunately do not peak in mass \rightarrow need another variable to control the purity.
- Instead we define an isolation variable:

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

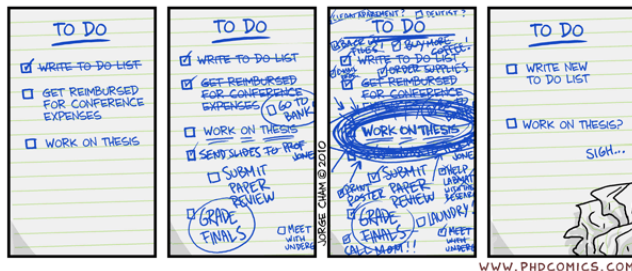
- For two muons we take the maximum of the two isolations:

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



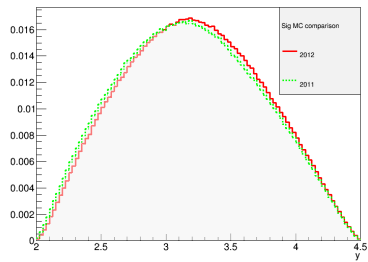
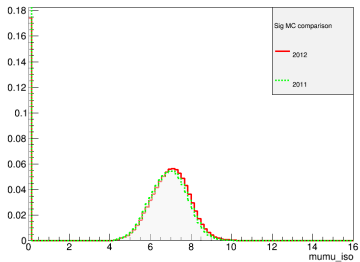
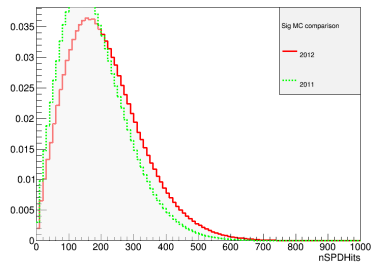
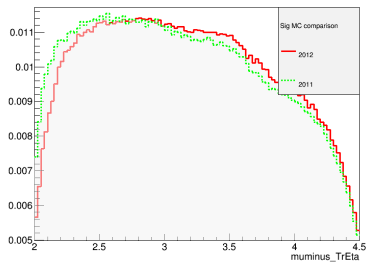
From last meeting we got a todo list

YOUR "TO DO" LIST

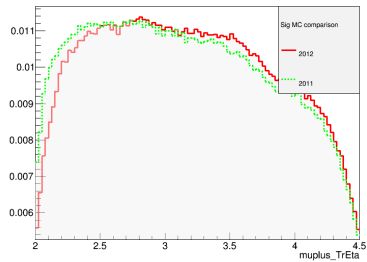
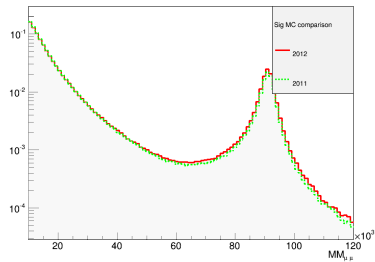
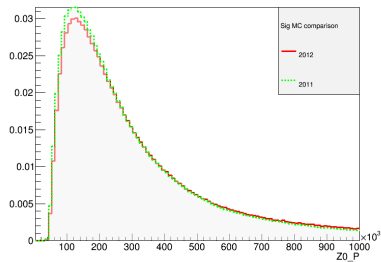
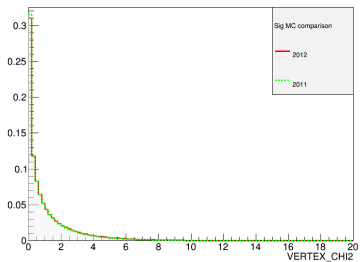


- Include 2012 data.
- We asked new MC for both 2011 and 2012 data taking.
- Provide also the ratio of cross sections for two years.

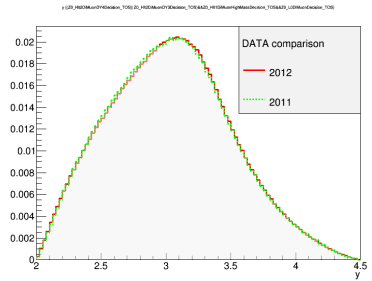
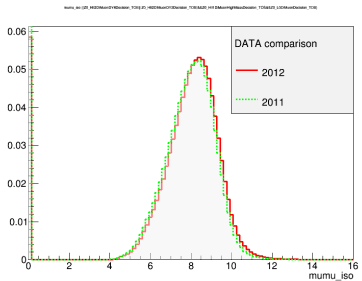
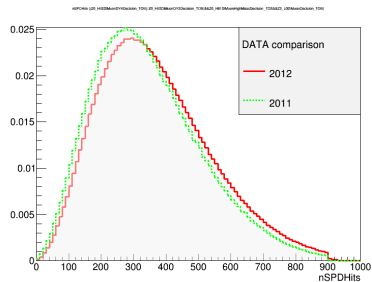
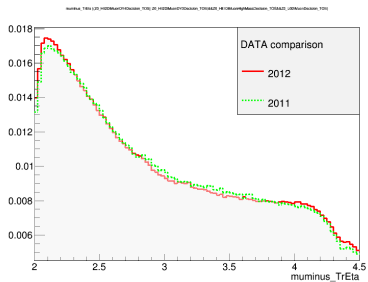
2011 vs 2012 MC comparison



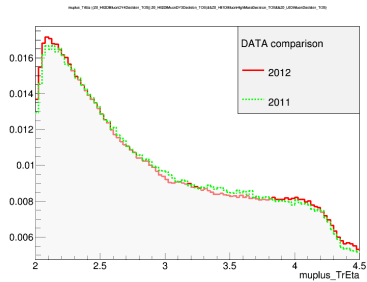
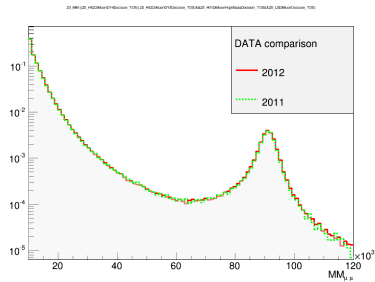
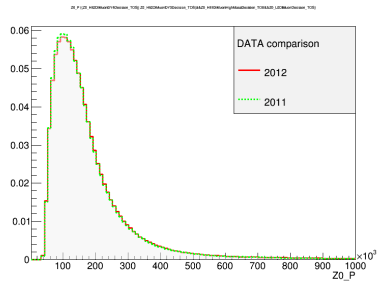
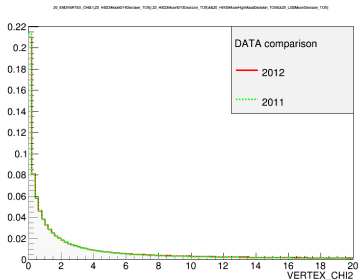
2011 vs 2012 MC comparison



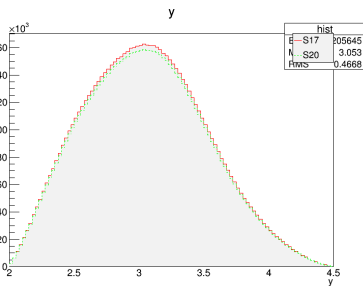
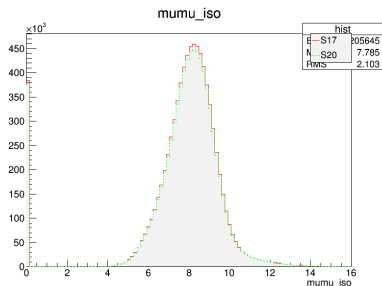
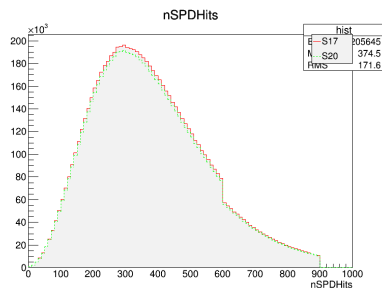
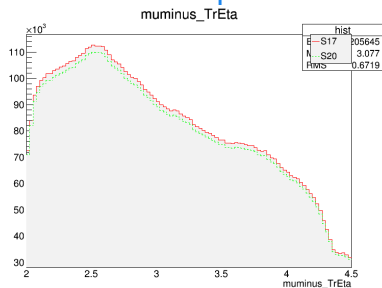
2011 vs 2012 data (S20) comparison



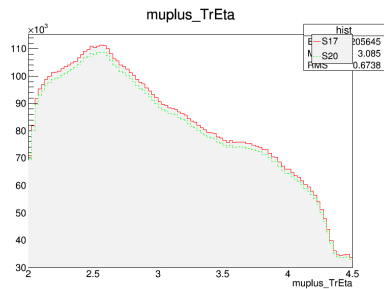
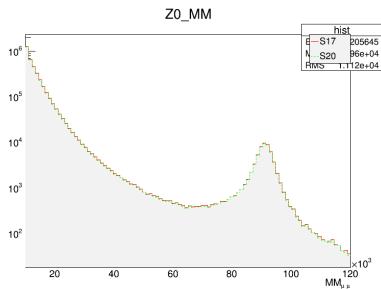
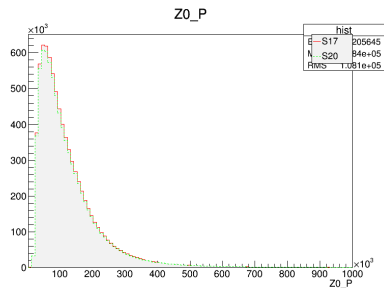
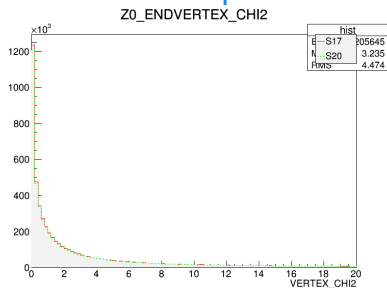
2011 vs 2012 data (S20) comparison



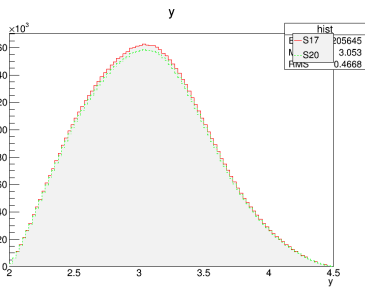
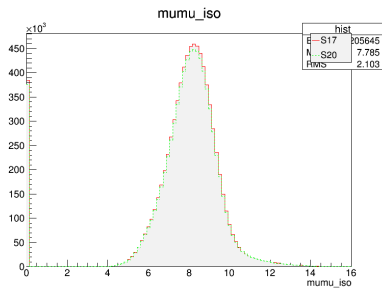
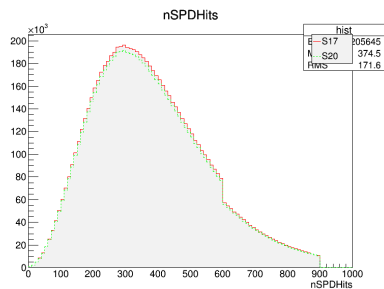
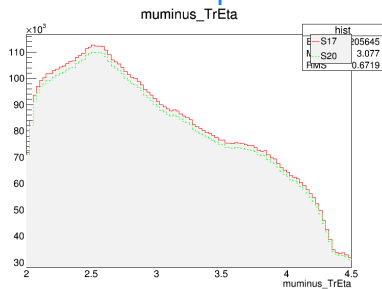
S17 vs S20 comparison



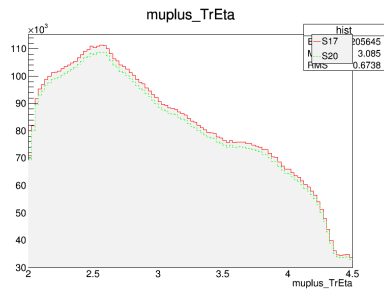
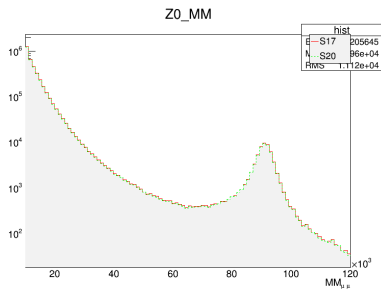
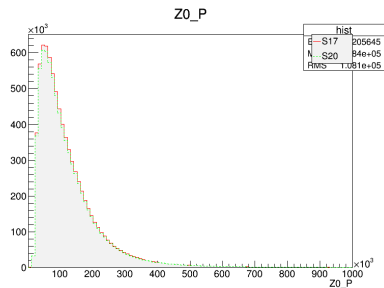
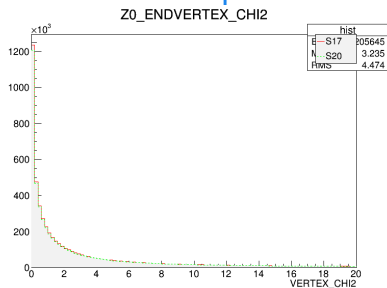
S17 vs S20 comparison



S17 vs S20 comparison



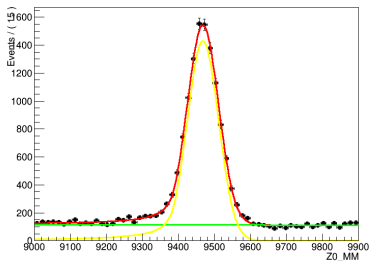
S17 vs S20 comparison



Calibration samples comparison

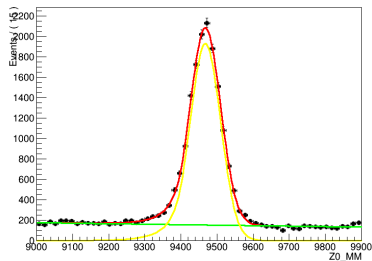
2011

A RooPlot of "Z0_MM"

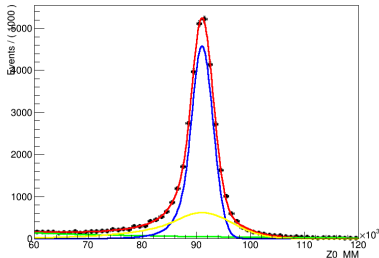


2012

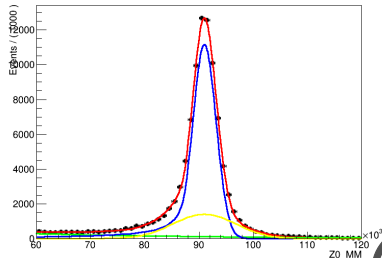
A RooPlot of "Z0_MM"



A RooPlot of "Z0_MM"



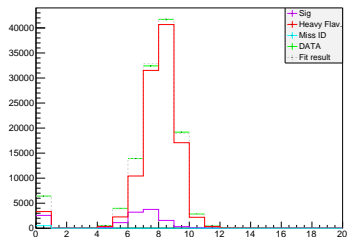
A RooPlot of "Z0_MM"



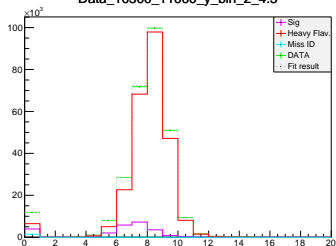
2011

2012

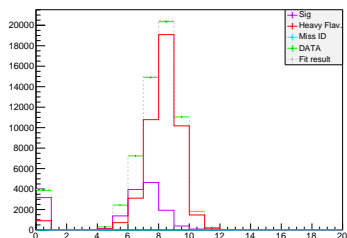
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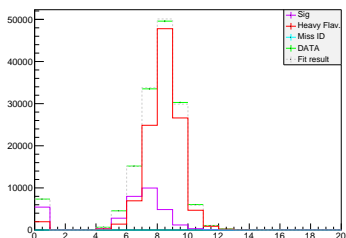
Data_10500_11000_y_bin_2_4.5



Data_14000_15000_y_bin_2_4.5



Data_14000_15000_y_bin_2_4.5



Conclusions

- We reprocess the data and the new MC with S20.
- A lot of consistence checks done between 2011 and 2012.
- The final fits converge in similar manner for 2011 and 2012 data sets.
- Started writing the ANA note.
- There is one thing I am trying out: So up to now I was using the `TFractionFitter`, there is a RooStats/RooFit fitter: `HistFactory`