Simulation of the background for analyses with ew-penguin.
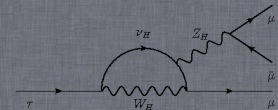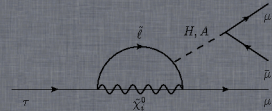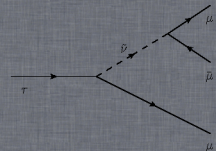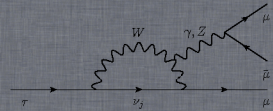
Marcin Chrząszcz[1,2] , Nicola Serra[1]

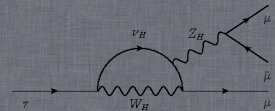[1] University of Zurich , [2] Institute of Nuclear Physics, Krakow,
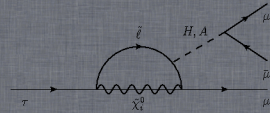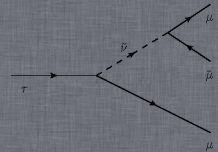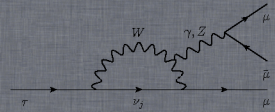
2nd October 2013

University of Zurich[UZH]

MC vs Data

Dimuon bck importance

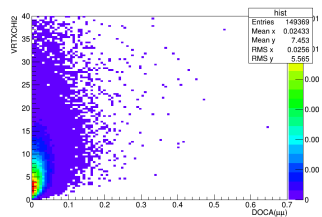# Reminder

1. Last week we proposed a general MC production for all EW penguin.
2. Production would consist of two samples:striped and non-stripped.
3. Striped one would be used for bck studies.
4. Non-stripped one would be used for developing a MVA for future stripping.
5. There was few questions asked which we want to answer.

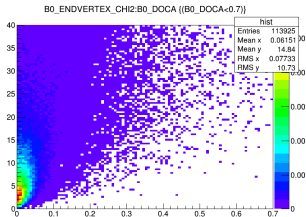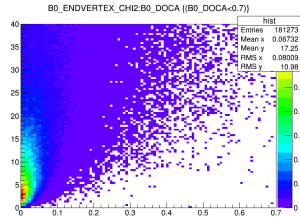Link to previous presentation.

MC vs Data

Signal

MC bck

Data

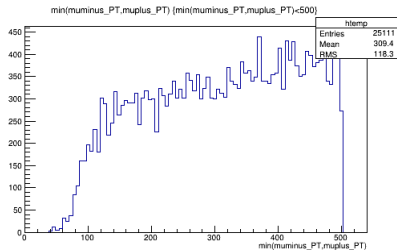# Dimuon bck importance

1. Is our background really 2 muons?
   - After stripping:
   - 0.96 has 2 muons.
   - 0.999 has at least one real muon.
   - Perfect :)

Cuts summary

DiMuon MC			
$\tau \to 3\mu$		EW	
$p_{t\mu}$	$> 290 MeV$	$p_{t\mu}$	$> 120 MeV$
p_μ	$> 2.9 GeV$	p_μ	$> 2.9 GeV$
$M(\mu\mu)$	$< 4.5 GeV$	$m(\mu\mu)$	$< 5.1 GeV$
DOCA$(\mu\mu)$	$< 0.35 mm$	DOCA$(\mu\mu)$	$< 0.45 mm$

M.Chrząszcz, N.Serra 2013

Cuts summary
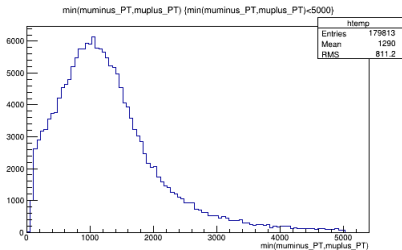
Cut on *Pt* over 99% efficient!

Gain using MC cuts

1. Back-of-the-envelope calculation
2. Based on $\tau \to 3\mu$ sample.
3. $8\times$ the speed of production(compared to single dimuon)
4. $\mathcal{O}(10^3)$ gain compared to inclusive bb.

Conclusions

1. Modifications to cuts is still possible. Let us know.
2. We ask for comment/suggestions.
3. Hope this sample will be useful for other analysis as for $K^*\mu\mu$.
4. We hope this can move forward quickly to put our hands on this sample :)