Status report on

$$\eta \to \pi^+ \pi^- e^+ e^-$$

Phi-decays WG meeting 30-05-2007

MC status

A lot of work has been done by Simona
to restart the dst production

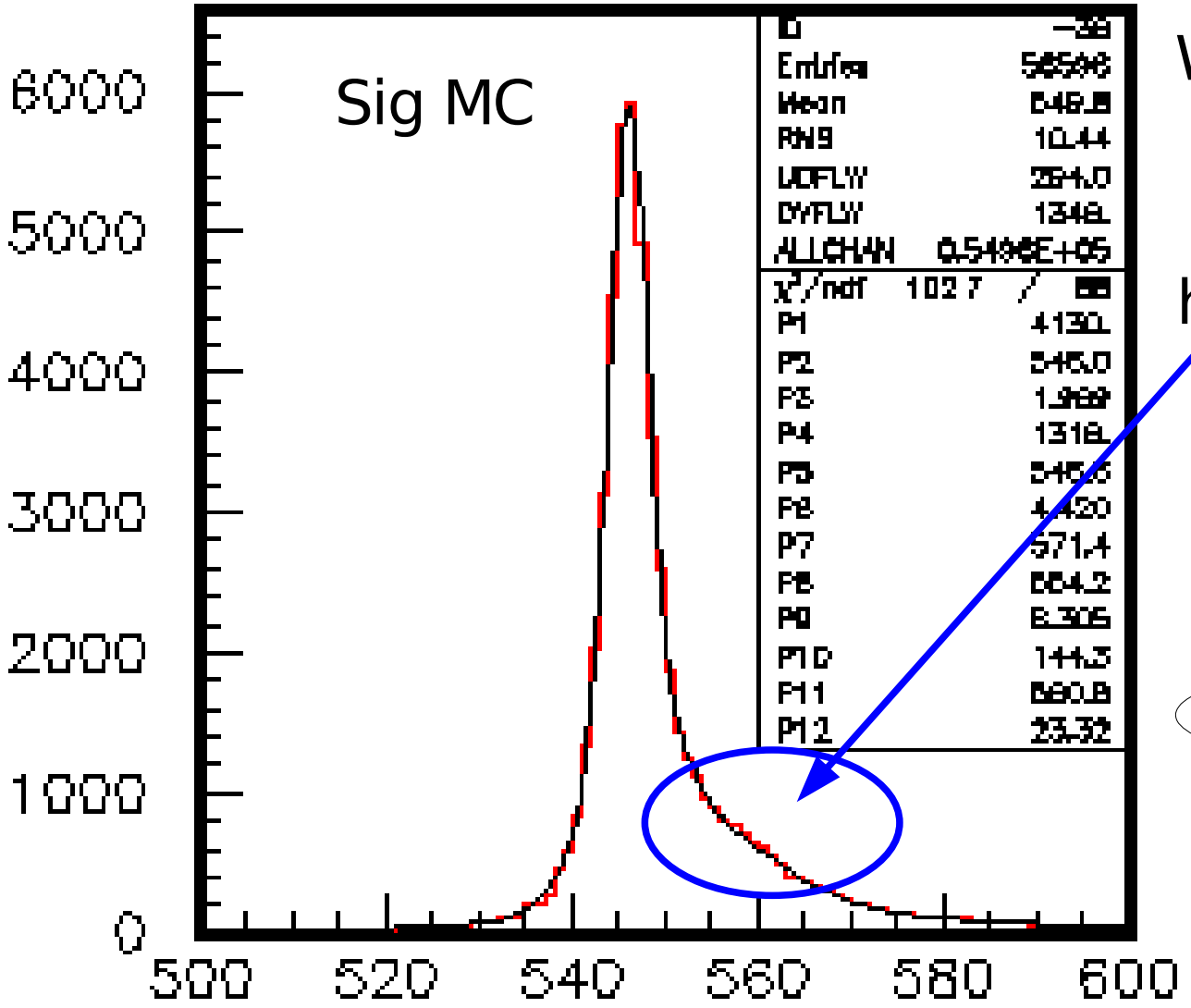
On May 25 the production of mrc dst restarted
(tested, seems ok)

Production rate ~13 pb^{-1}/day

> 600 pb^{-1} to be processed (~2 months)

Requested to redo all dst mrc for 2005

Improving particle selection

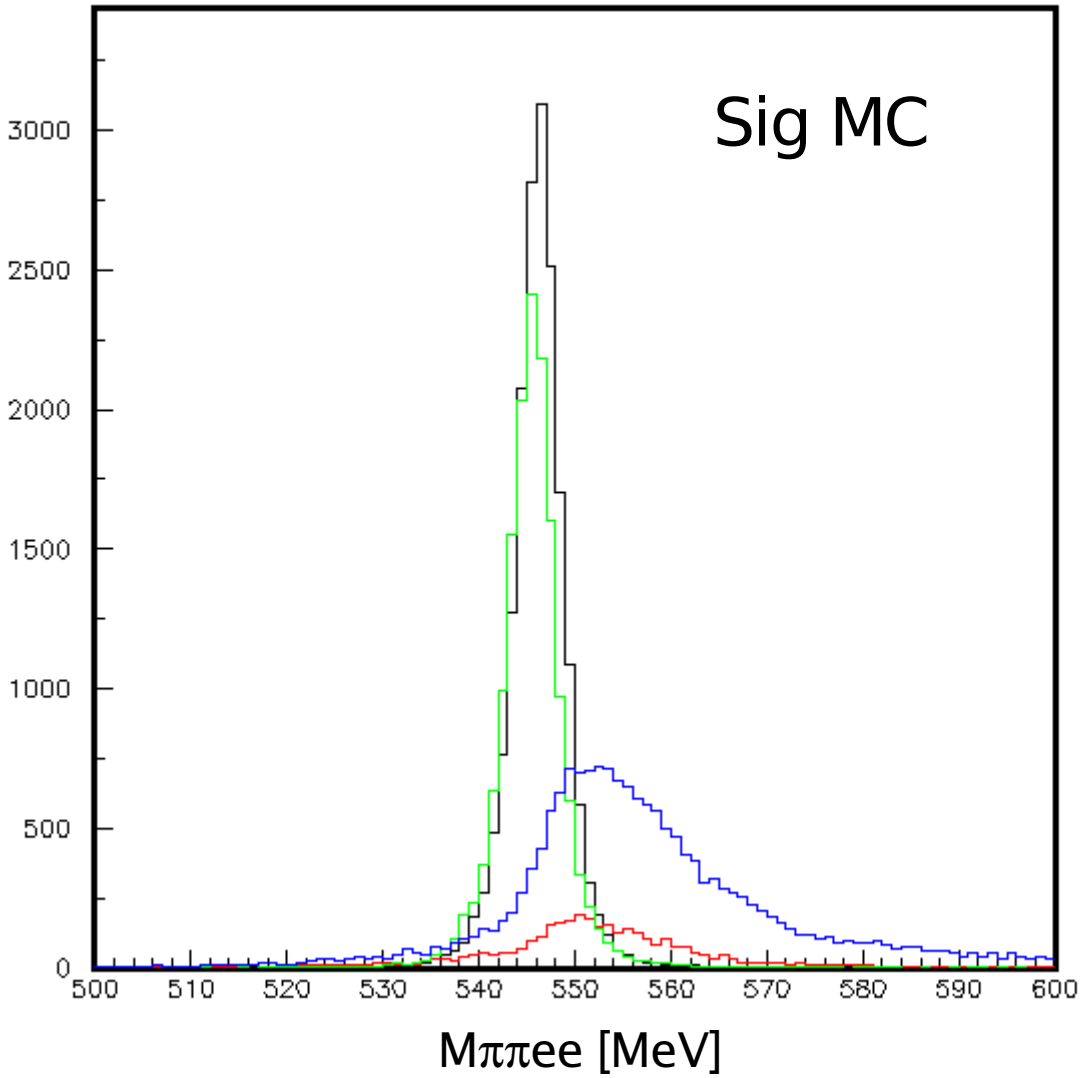


Wrong particle selection

⇓

hunch-backed spectrum

Improving particle selection



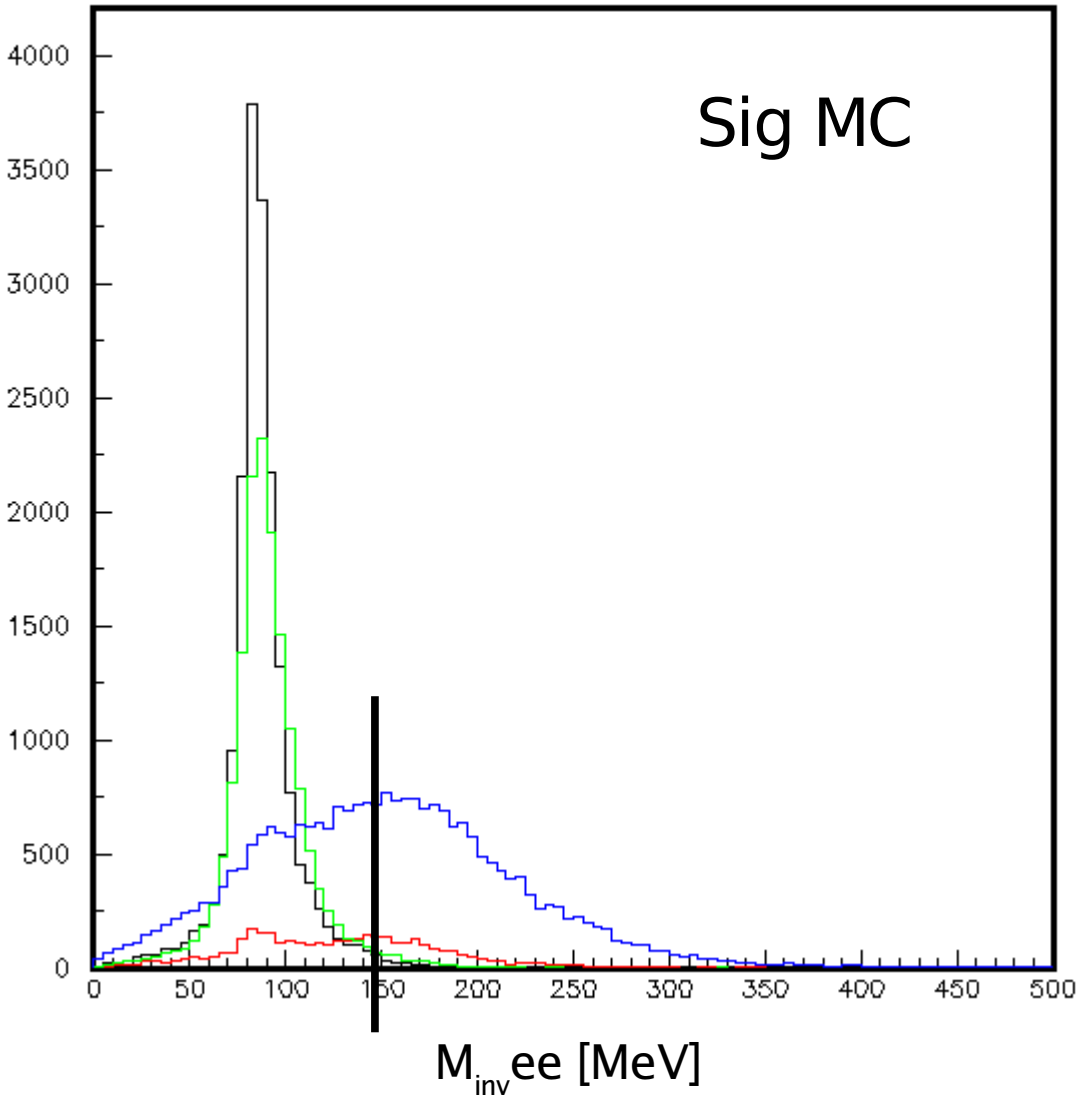
Fit hp = ordered momenta

Kine ok

y	y	Sample 1
y	n	Sample 2
n	y	Sample 3
n	n	Sample 4

Sampe i ∩ Sample j = Ø

Improving particle selection



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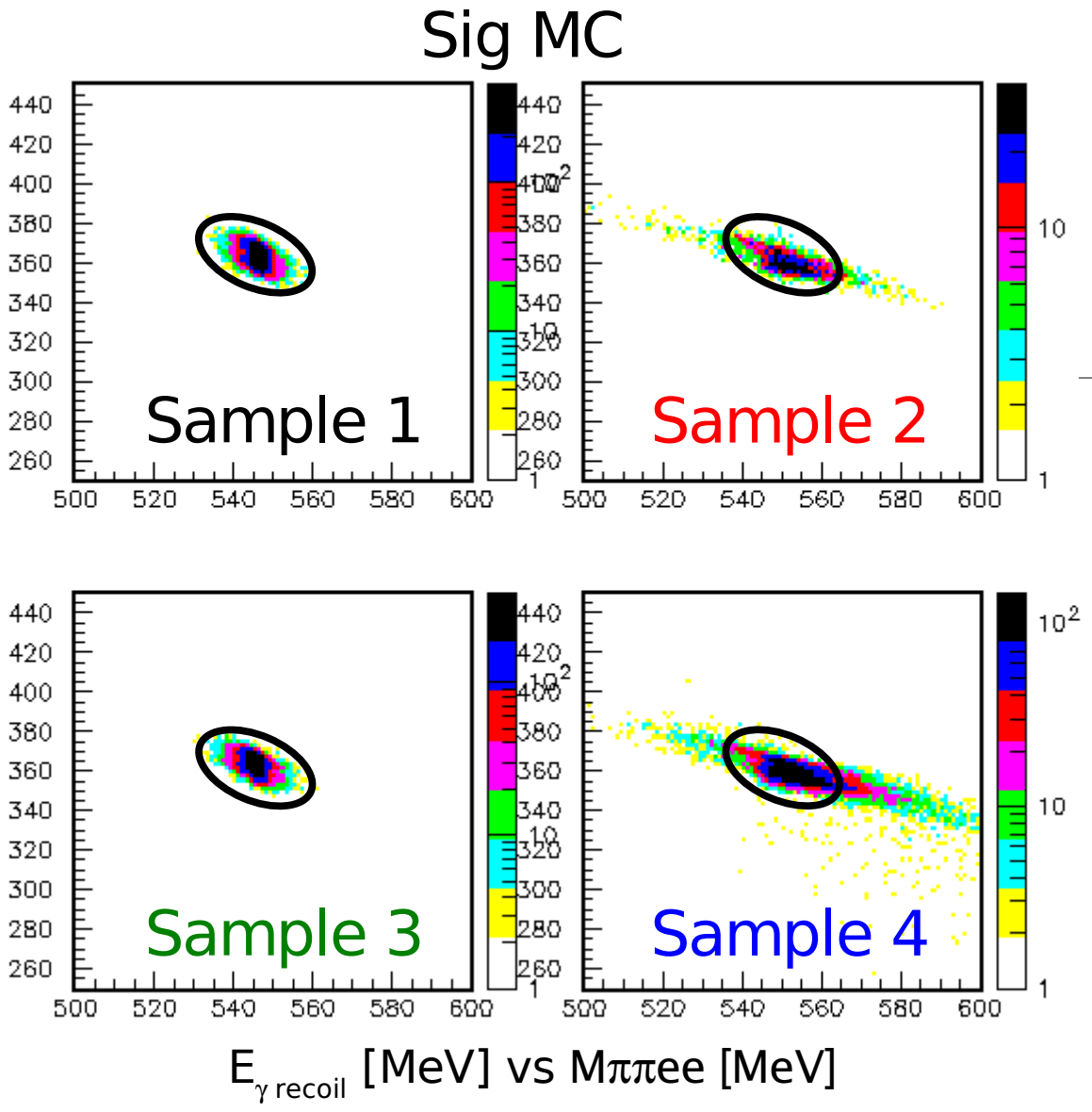
Improving particle selection



Fit hp = ordered momenta

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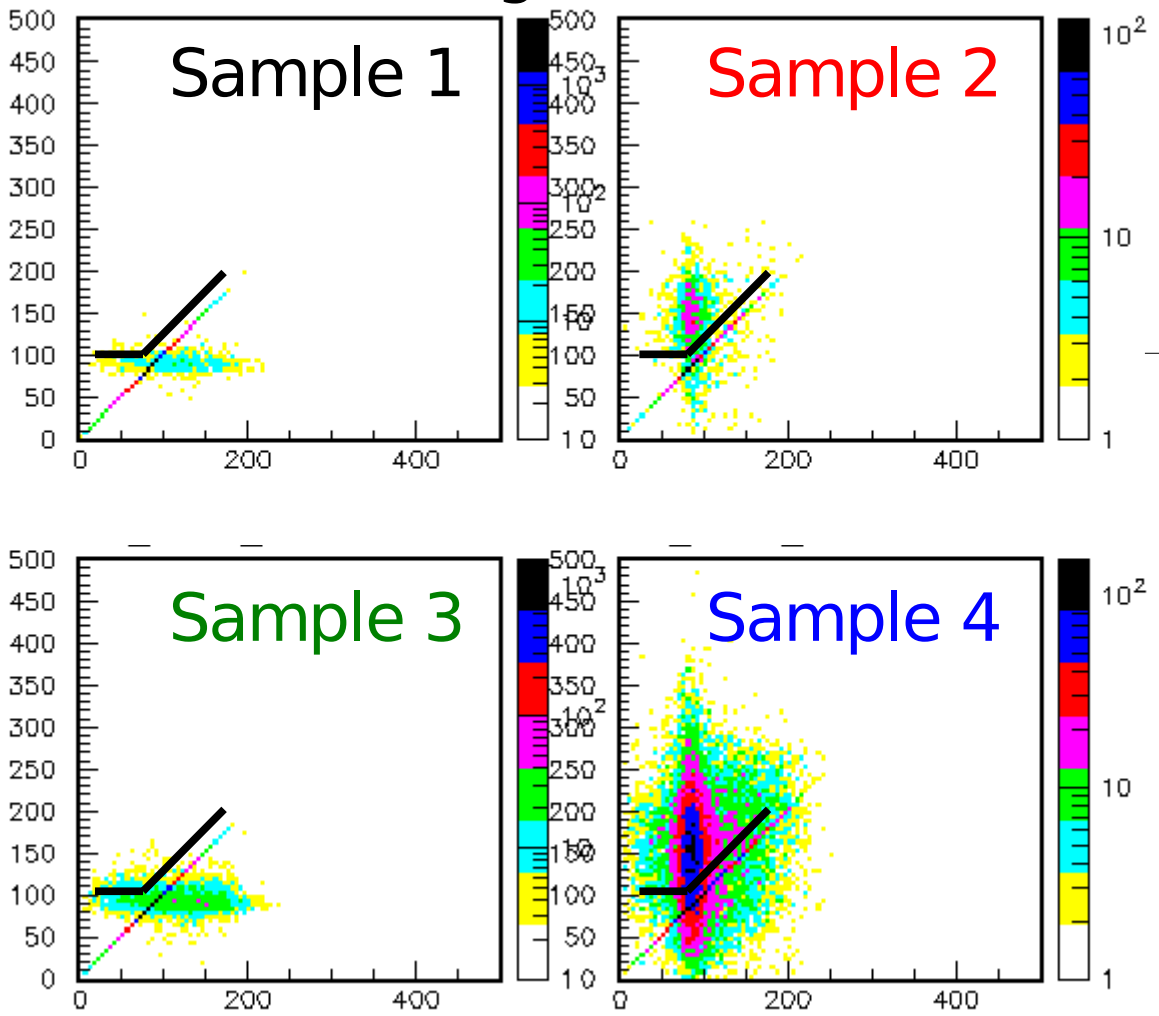
Improving particle selection

Sig MC



M_{inv}ee [MeV] w/ fit output vs w/o fit output

Fit hp = ordered momenta

Kine ok

y	y	Sample 1
y	n	Sample 2
n	y	Sample 3
n	n	Sample 4

Sampe i ∩ Sample j = Ø

Improving particle selection

For “candidate wrong events”

possible to look for a fifth track and redo the fit

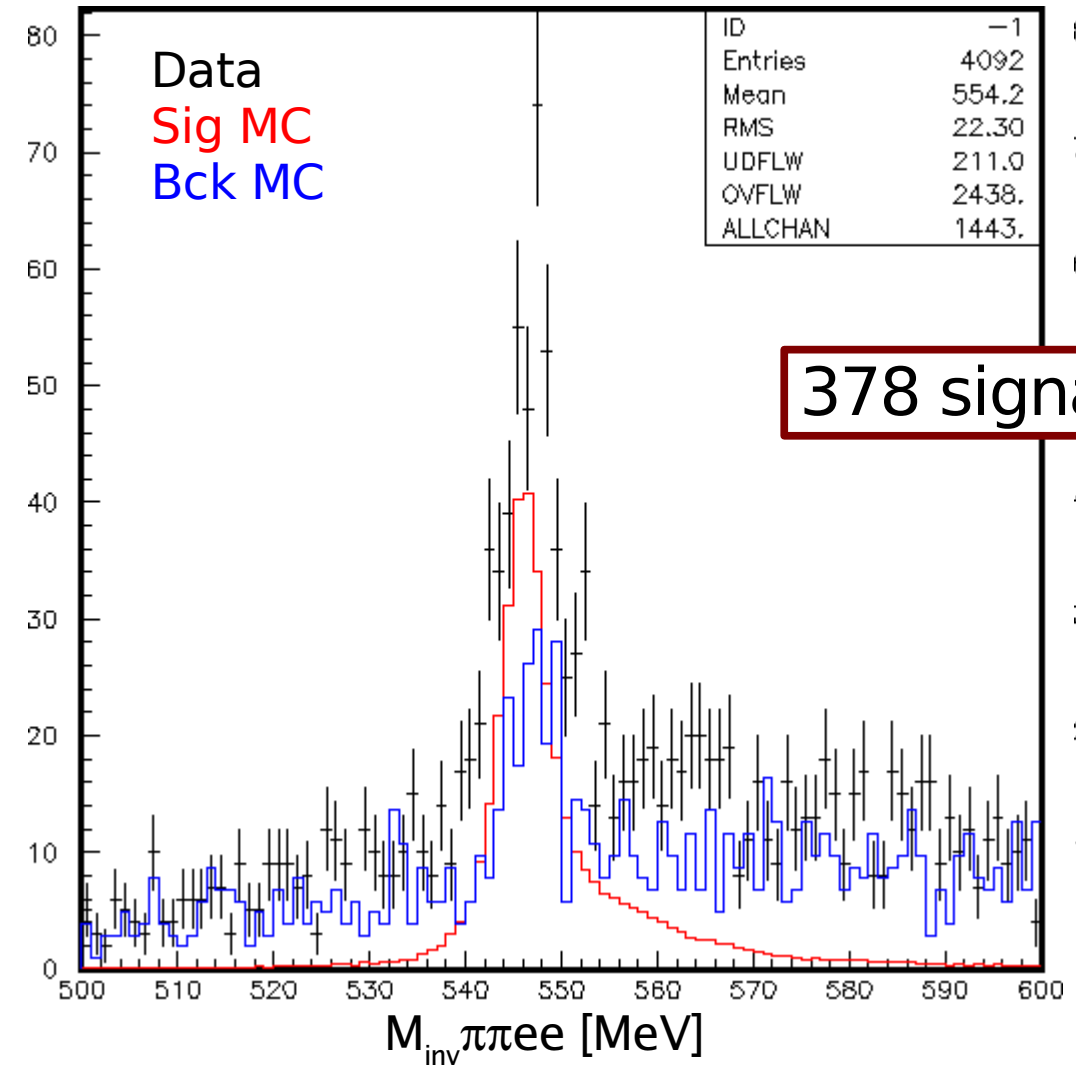
Already possible on signal,

needed mrc dst for background

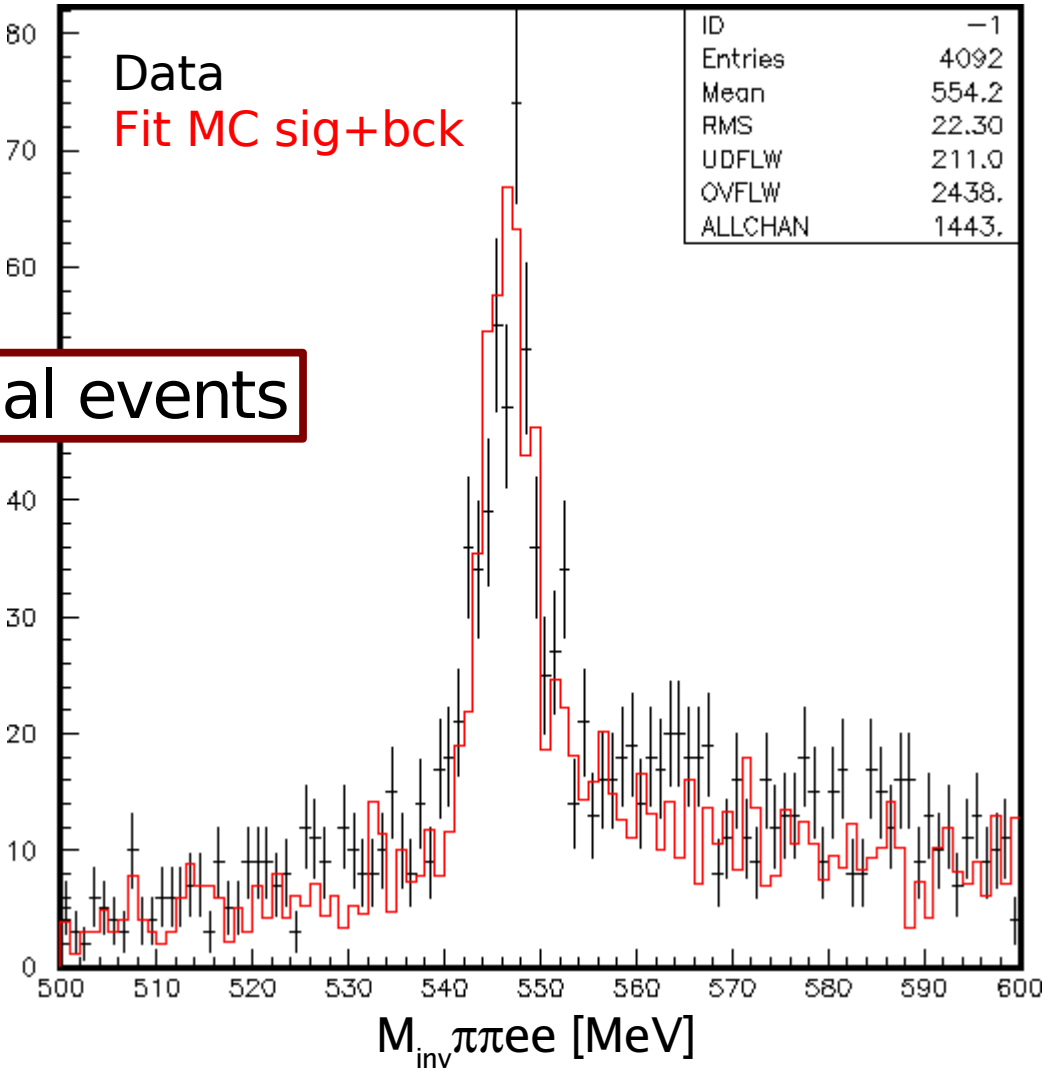
Work in progress

Towards the branching ratio

Fit of the data spectrum of $M_{inv}\pi\pi ee$
using the MC shape for signal and background



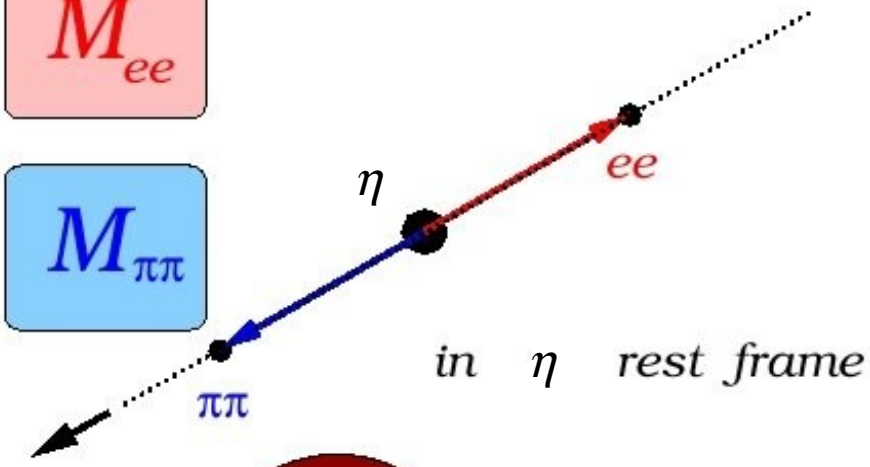
378 signal events



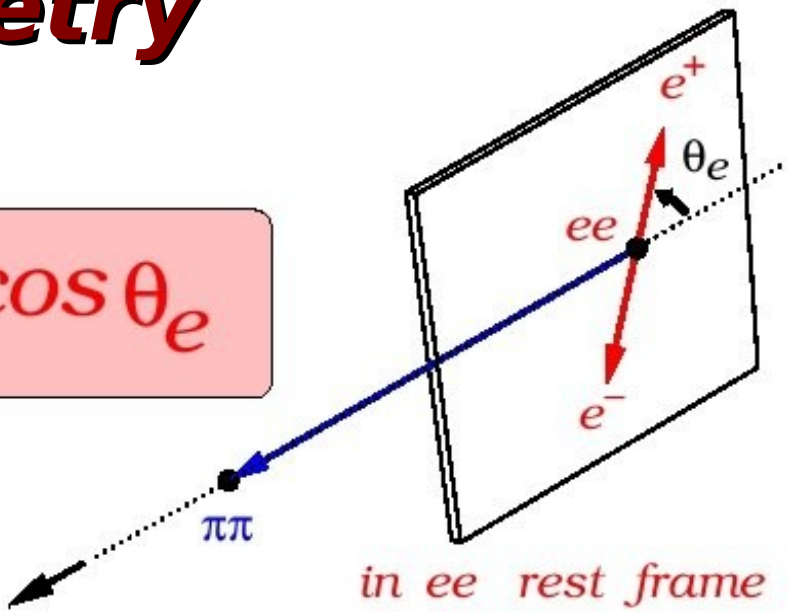
Asymmetry

M_{ee}

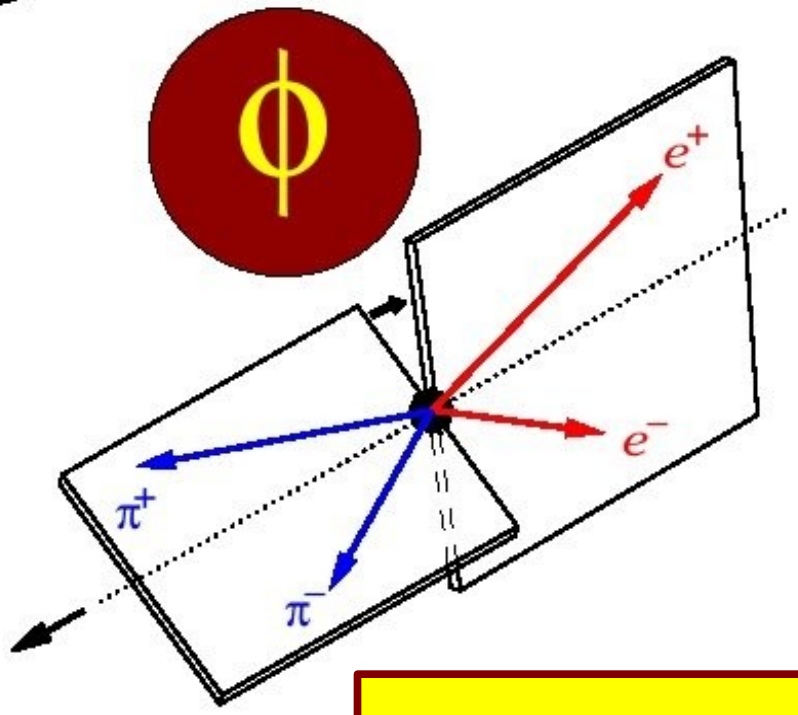
$M_{\pi\pi}$



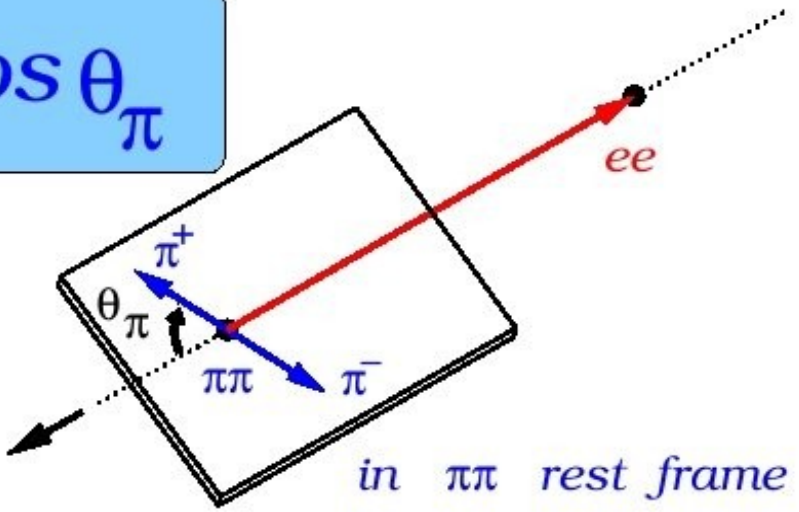
$\cos\theta_e$



ϕ



$\cos\theta_\pi$

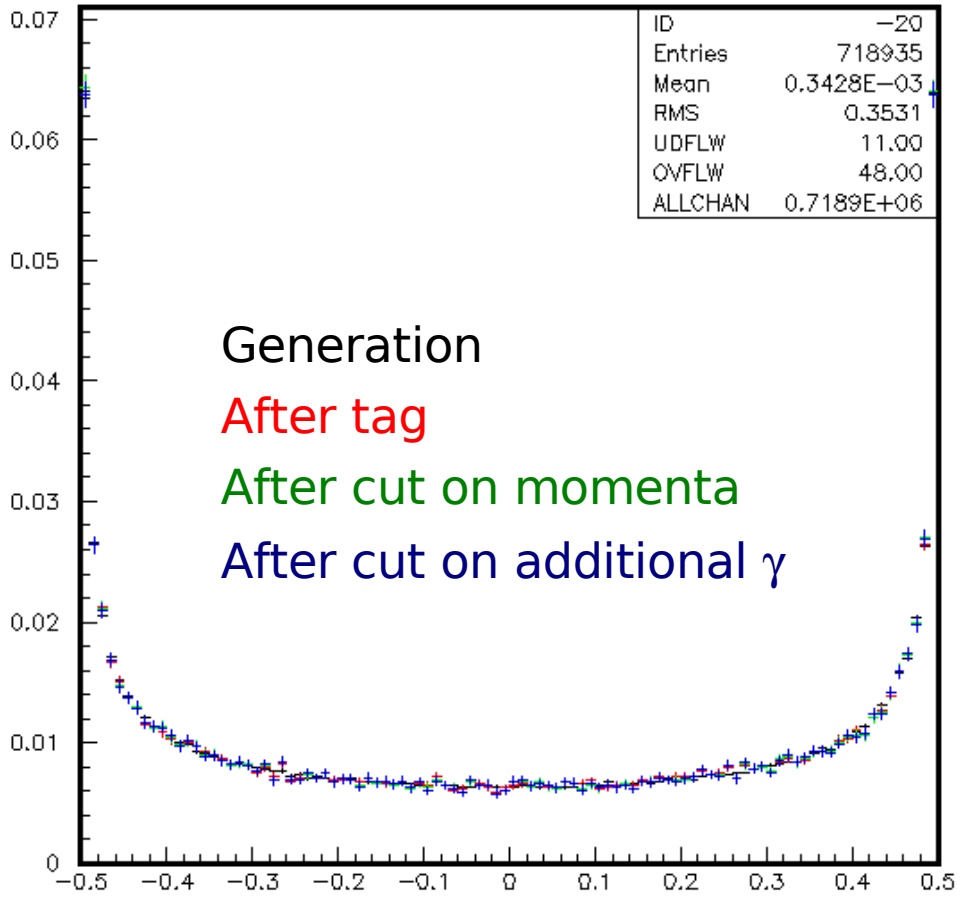


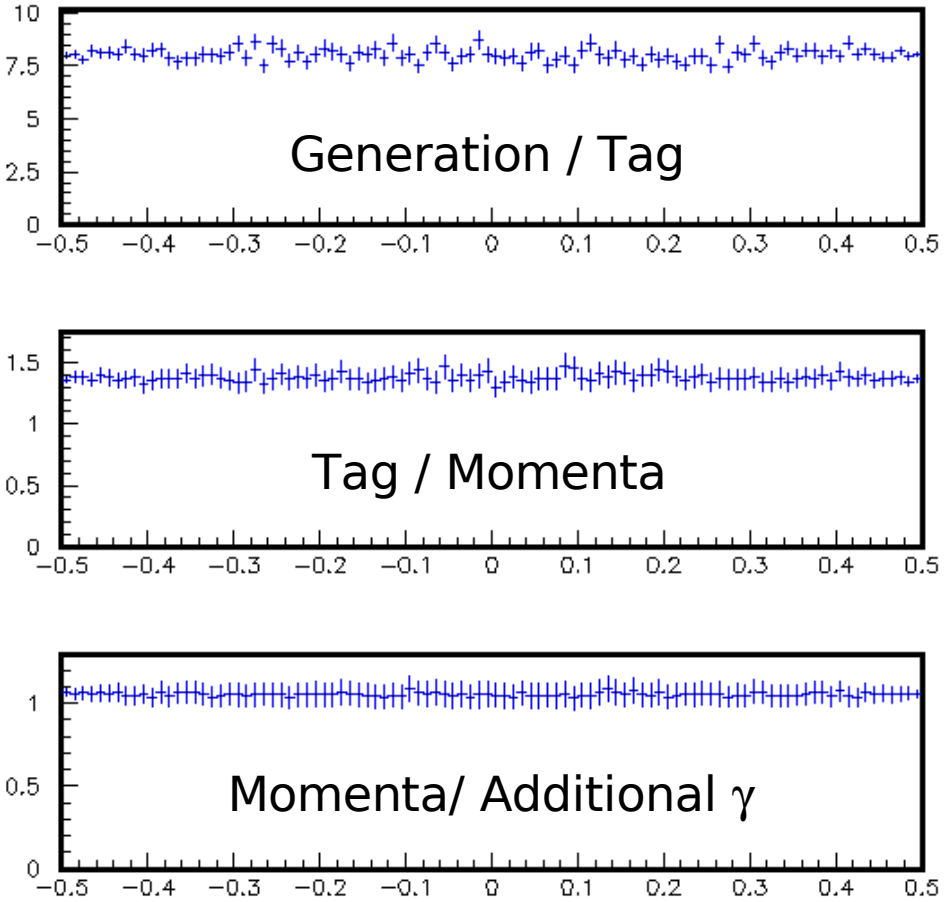
$$\sin\phi\cos\phi = (\hat{n}_{ee}\times\hat{n}_{\pi\pi})\hat{z}(\hat{n}_{ee}\cdot\hat{n}_{\pi\pi})$$

Asymmetry

$$\frac{N_{\sin\phi\cos\phi>0} - N_{\sin\phi\cos\phi<0}}{N_{\sin\phi\cos\phi>0} + N_{\sin\phi\cos\phi<0}}$$

Sig MC Kine

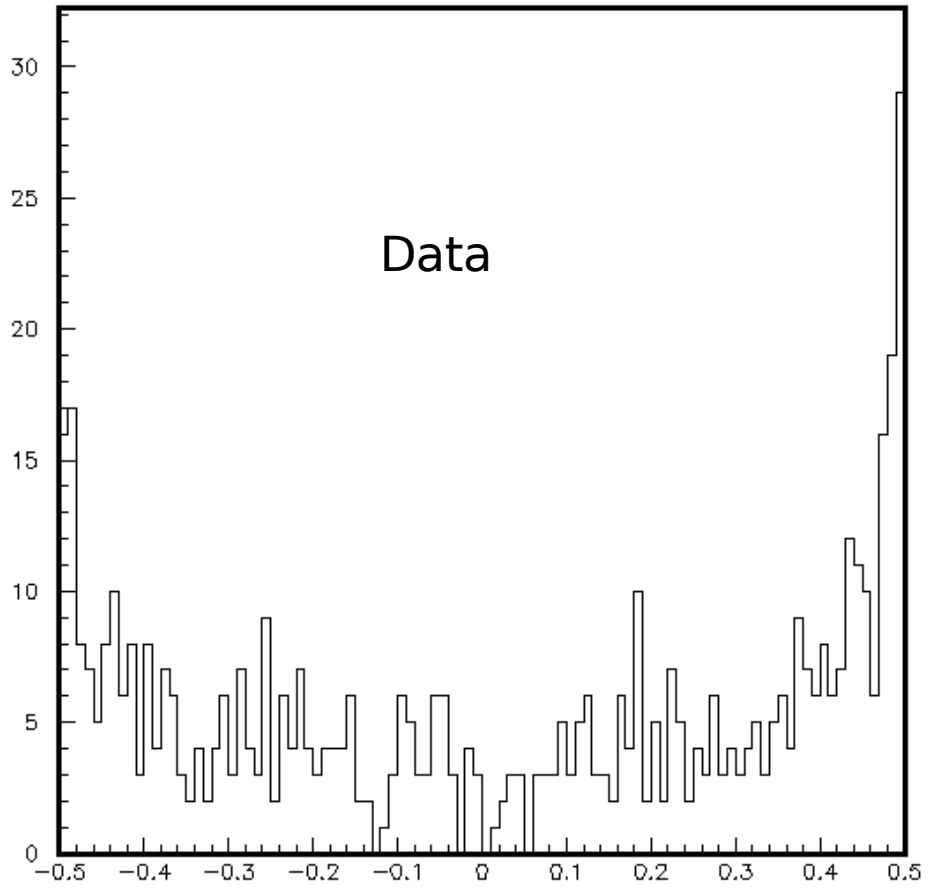




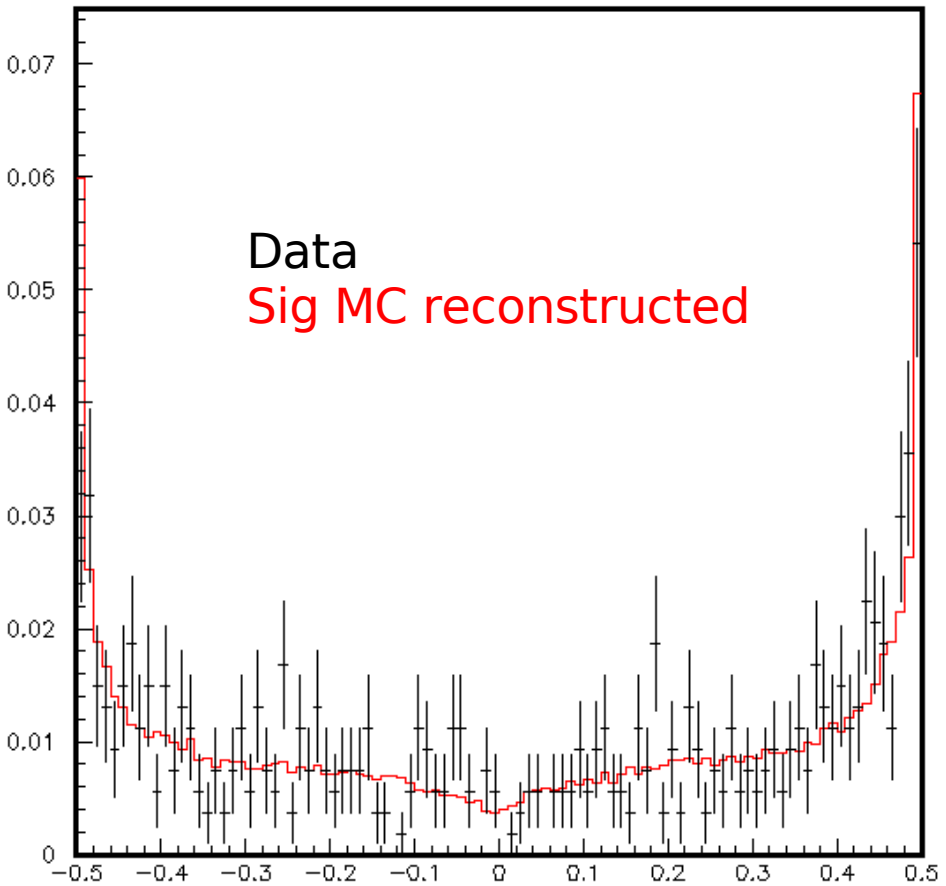
Distortion at each step

Asymmetry on data: first glance

Very rough cut: all events with $M_{inv}\pi\pi ee \in [540,555]$ MeV



sin ϕ cos ϕ



sin ϕ cos ϕ

A>0 with $\Delta A/A \sim 20\%$