$B^+ \to \rho^+\rho^0$ status

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This week

Explored if fake-ρ shapes can help in identifying mismodelling sources.

Checked mismodelling with tighter cuts (inspired from ρ⁺ρ⁻ analysis).
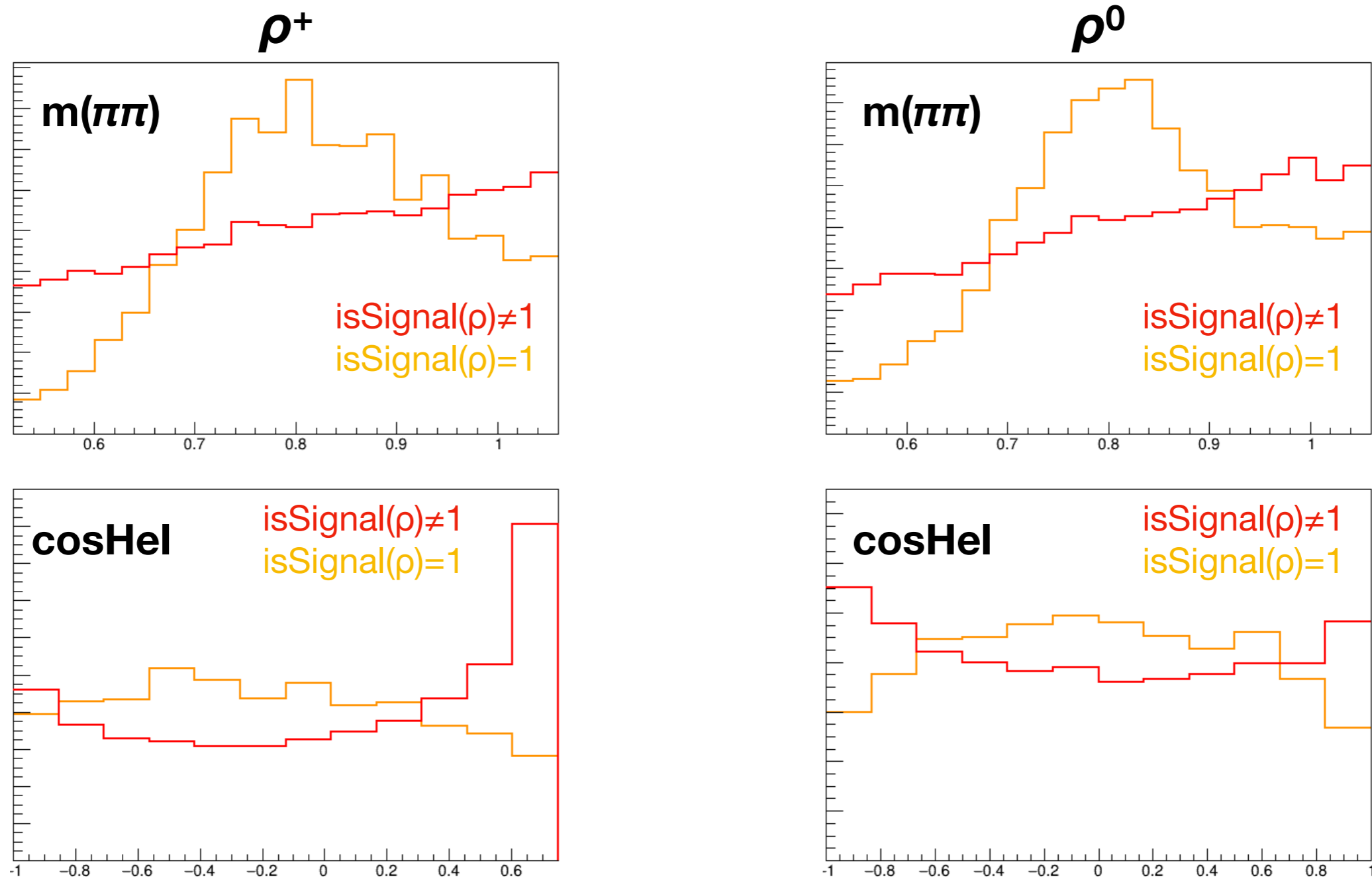
Data with E(ɤ) correction are less and not shifted.

Fake-ρ numbers

ρρ sideband	Real ρ⁺	Fake ρ⁺
Real ρ⁰	1 % 1.5 %	5 % 10 %
Fake ρ⁰	10 % 8.5 %	84 % 80 %

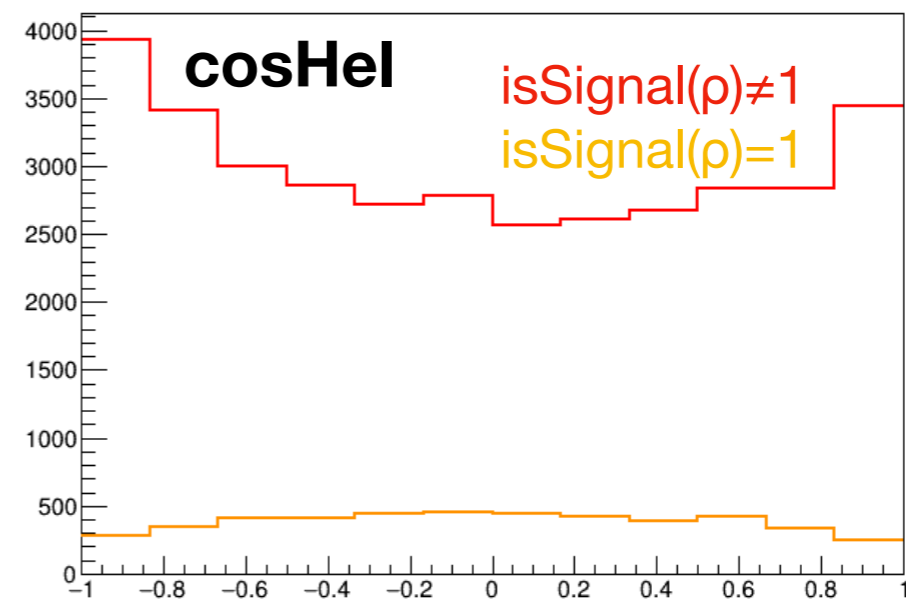| Dρ full isSignal≠1	Real ρ⁺	Fake ρ⁺
	20%	80%

Worth trying to disentangle?
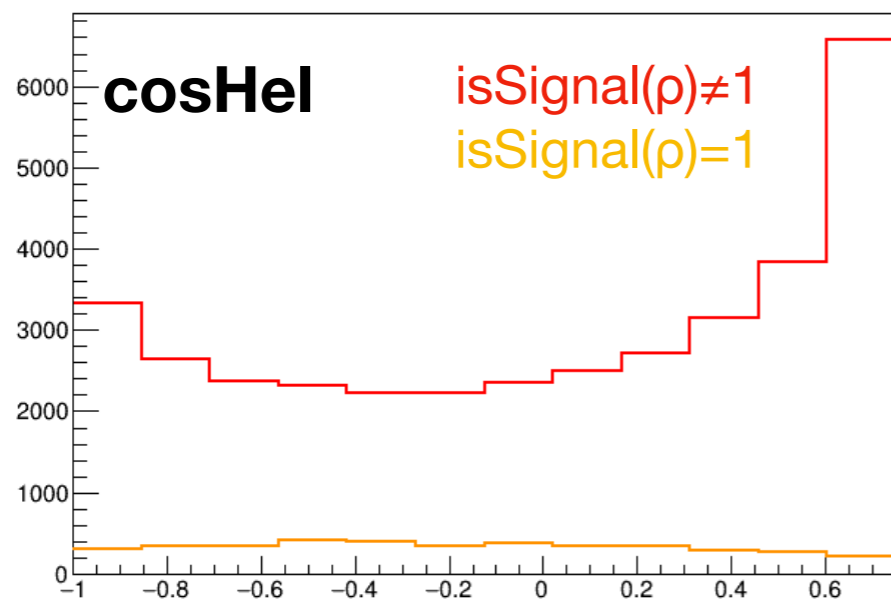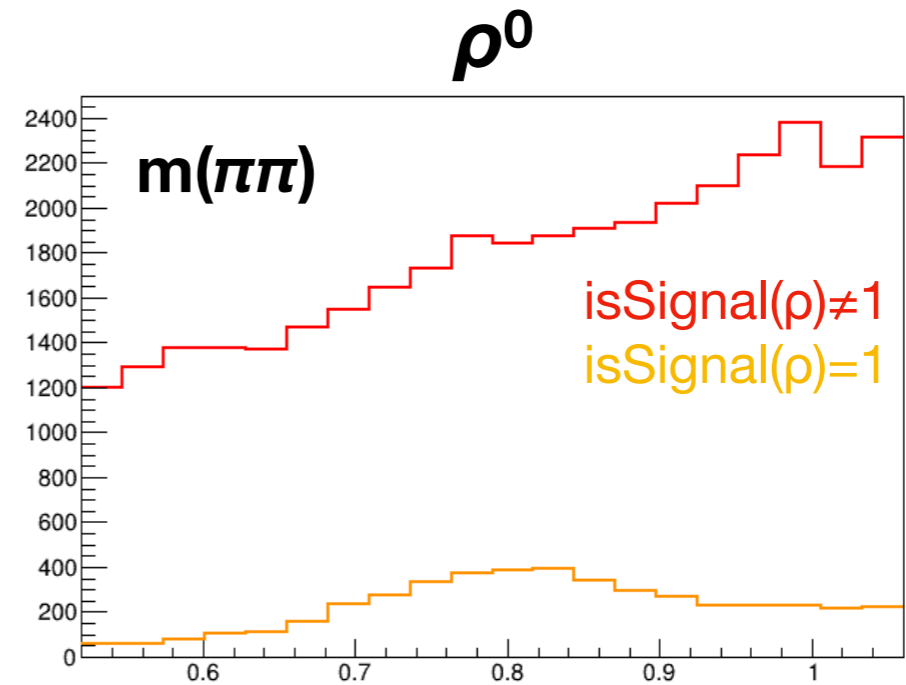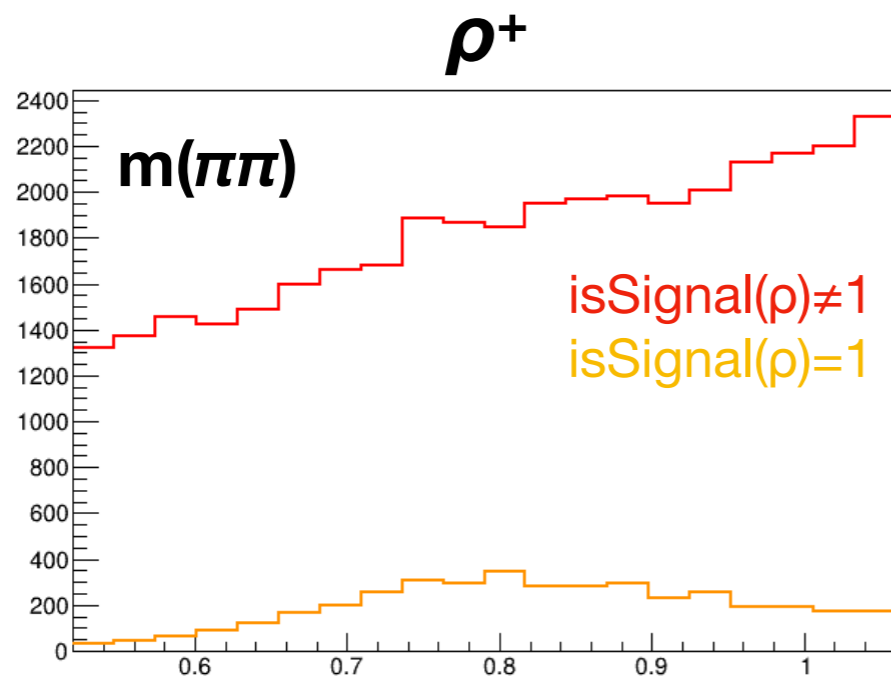
Continuum component

Continuum from sideband MC. Shapes normalized to same area.

**Real ρ seem to be generated with transverse polarization.
Wrong generator effect or data feature?**
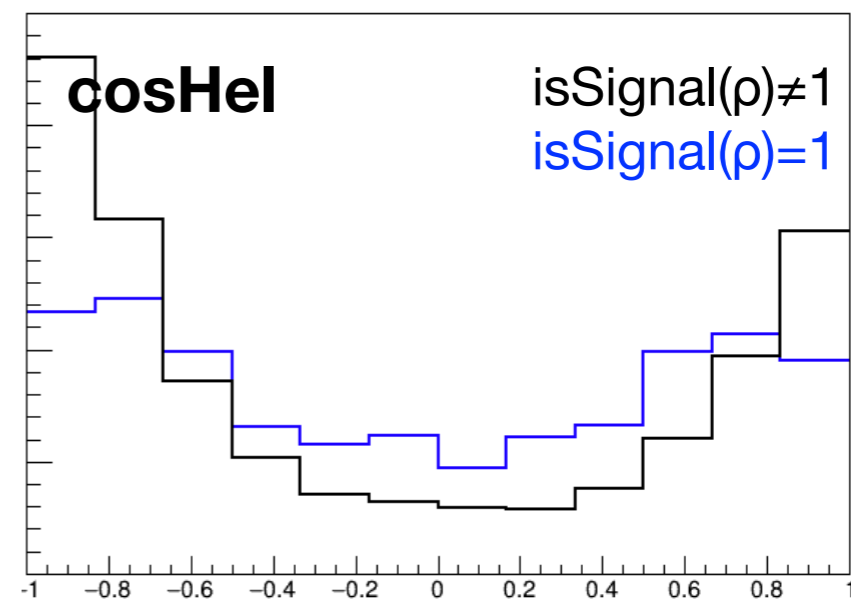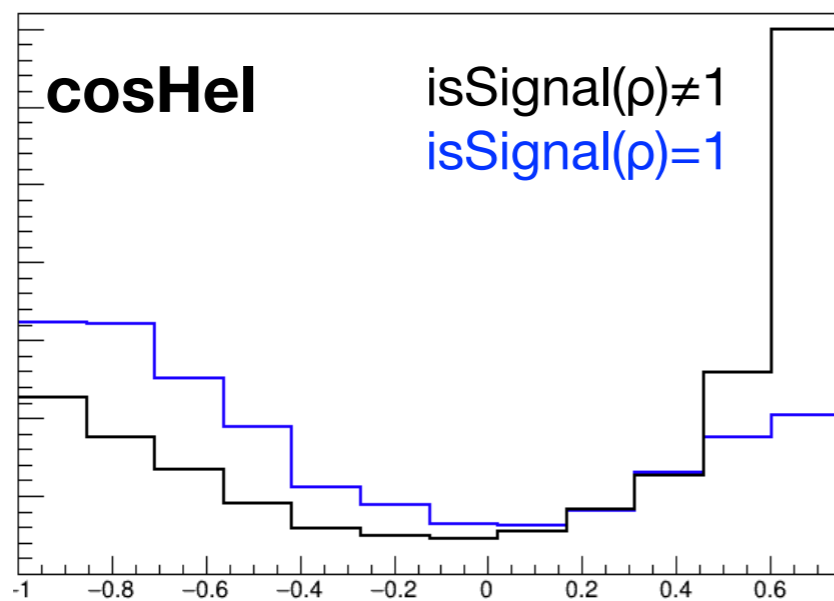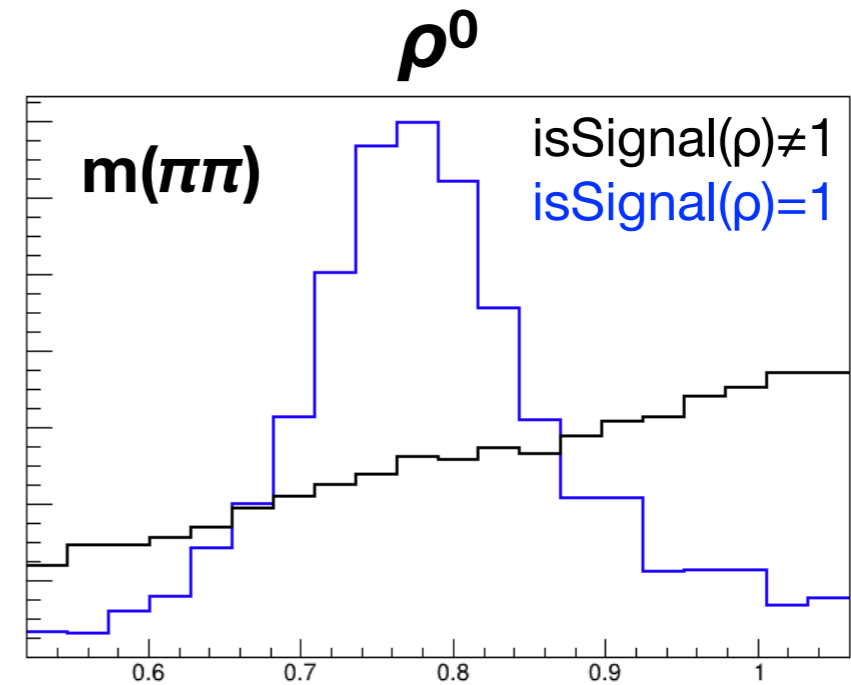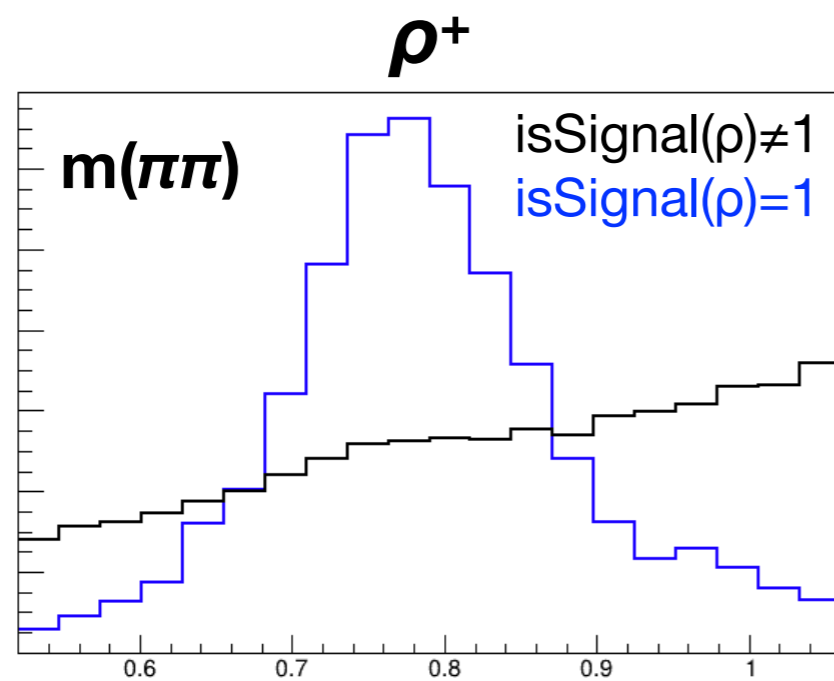
Continuum component

Continuum from sideband MC. Realistic proportions.

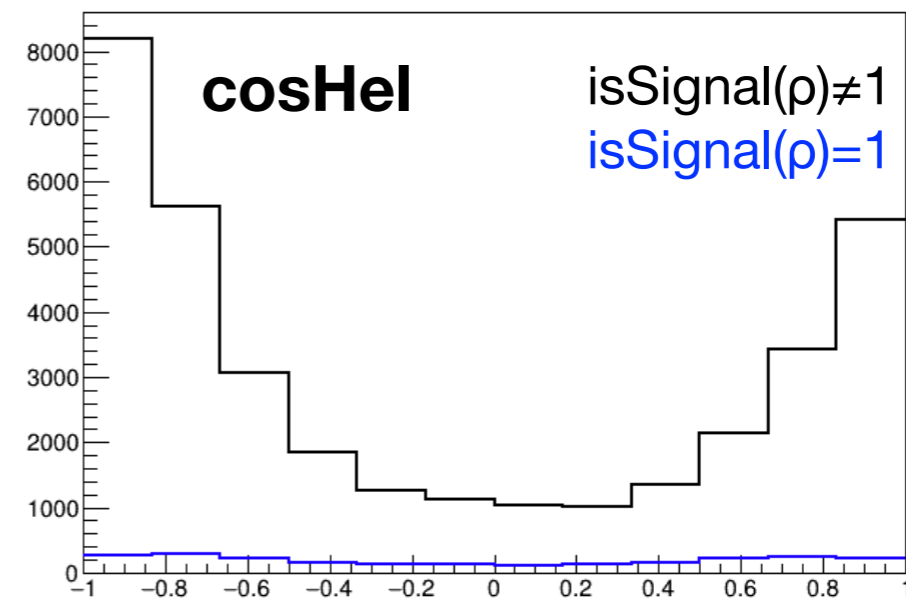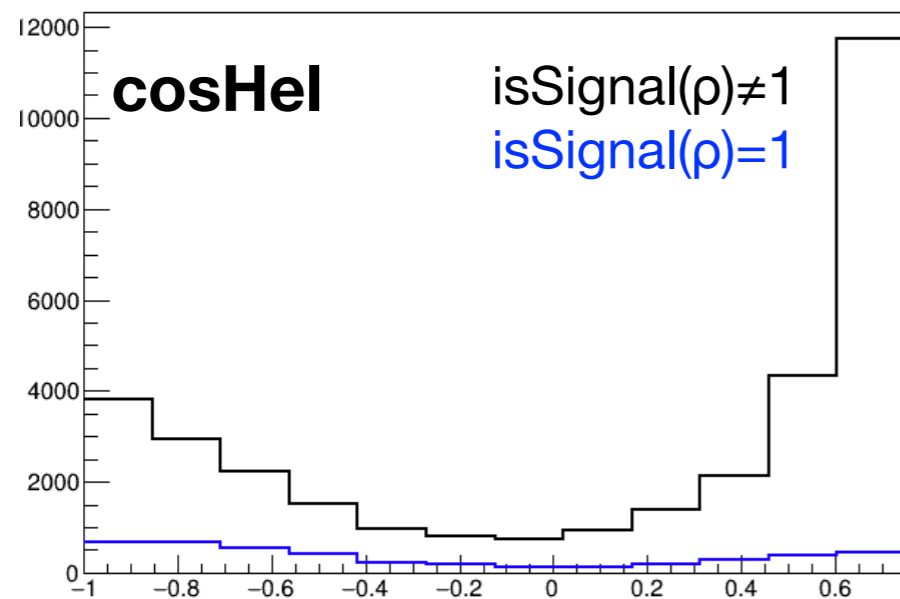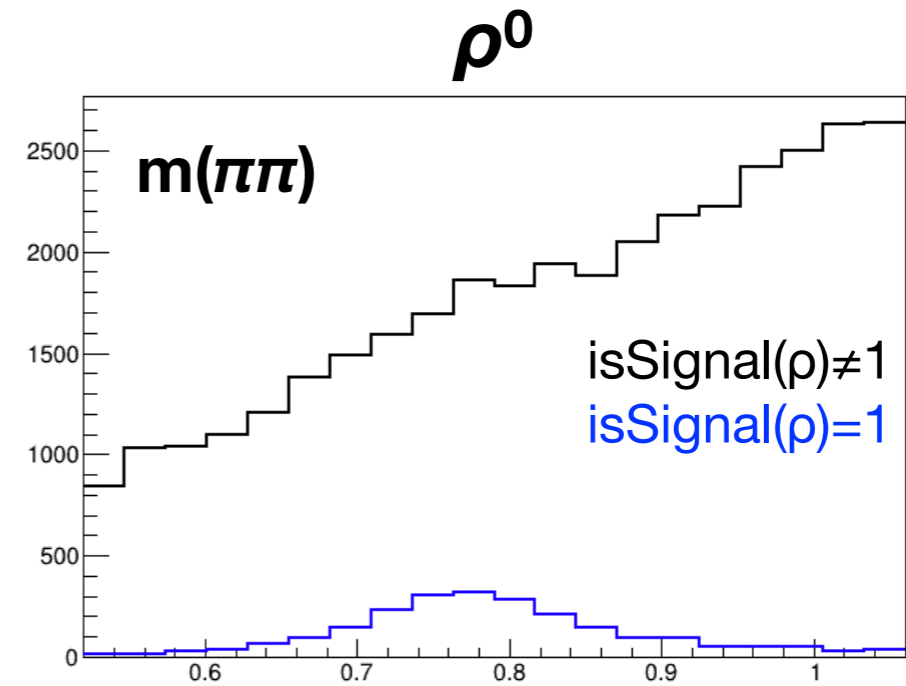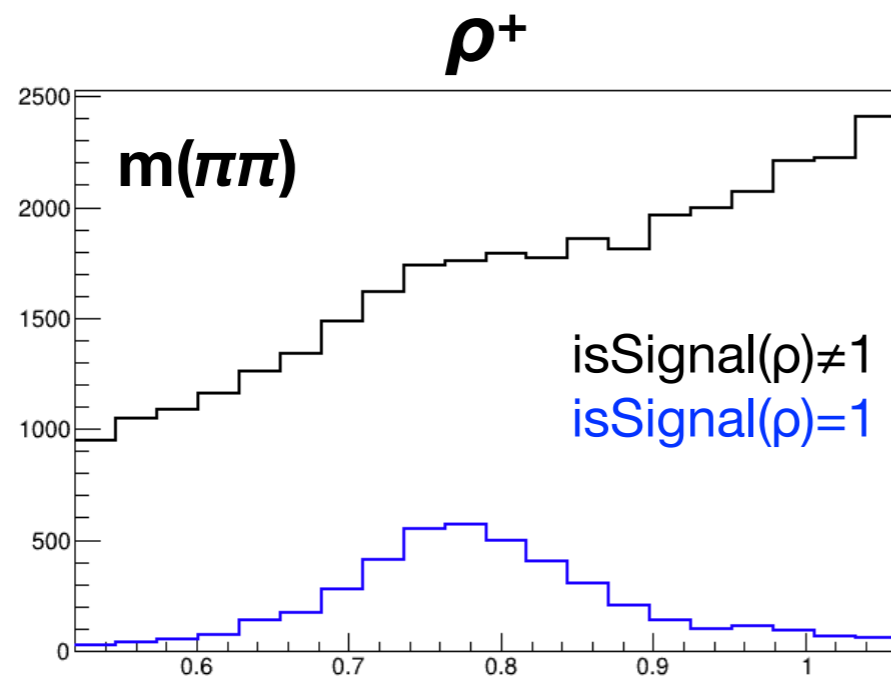**Fake ρ look actually more distributed like data.**

BBbar component

BBbar from sideband MC. Shapes normalized to same area.

ρ^+

ρ^0

BBbar component

BBbar from sideband MC. Realistic proportions.

ρ^+

ρ^0

m($\pi\pi$)

isSignal(ρ)≠1
isSignal(ρ)=1

cosHel

isSignal(ρ)≠1
isSignal(ρ)=1

Smaller fake ρ composition → smaller mismodelling.
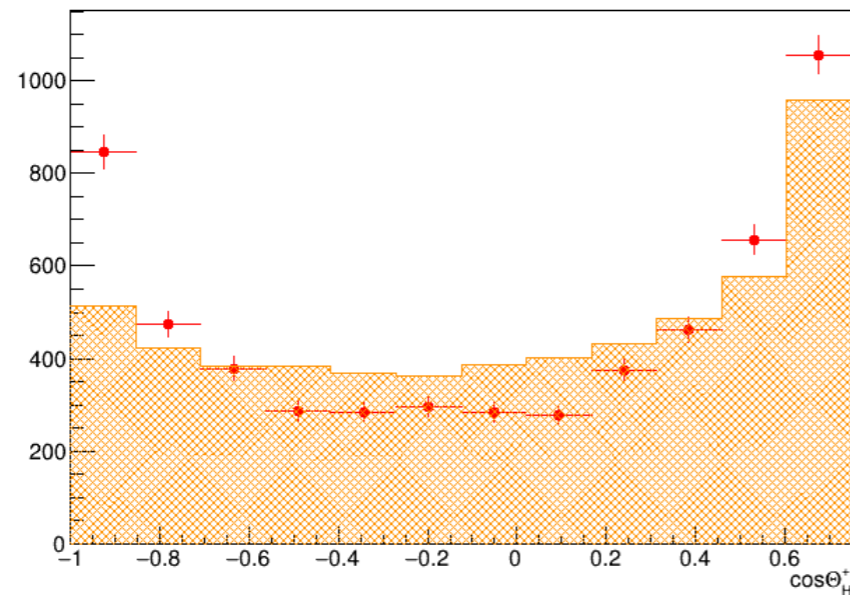**Coincidence worth investigating.**

tight cuts?

Tight photon selection

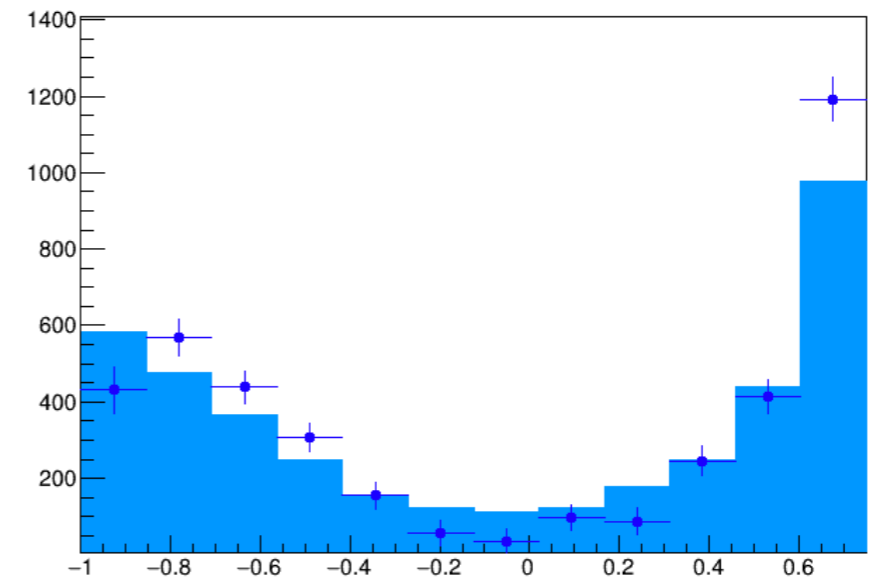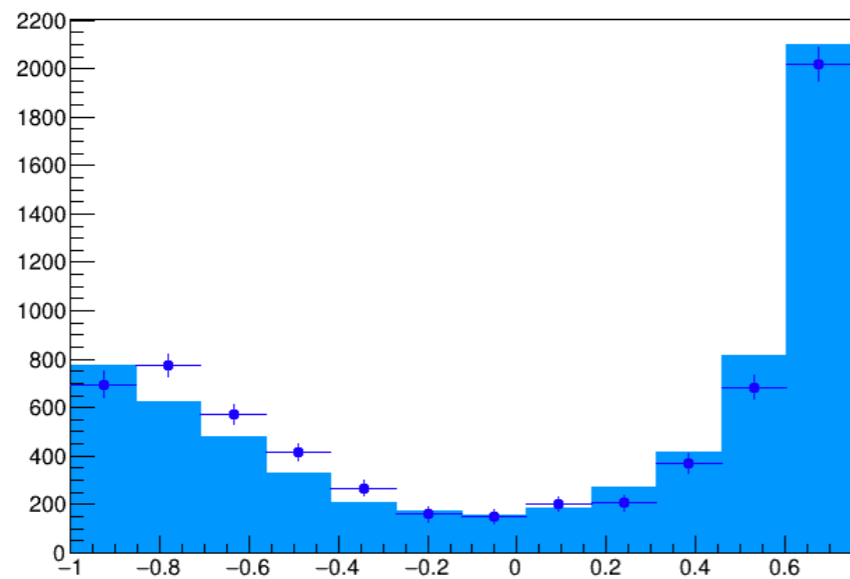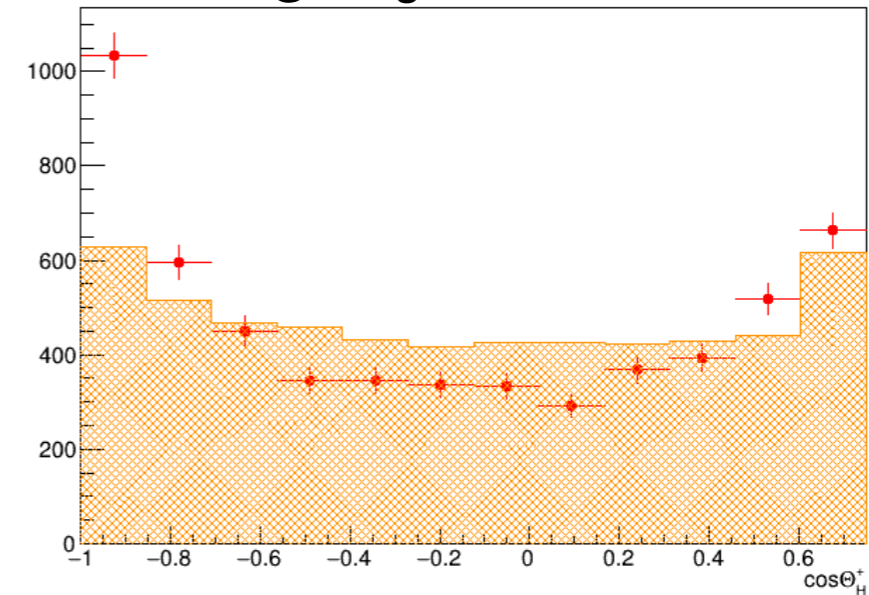In the ρ+ρ- analysis they use a different approach, with tight photon cuts.
They see much smaller mismodellings in the angles.
What happens if I use their same tight selection?
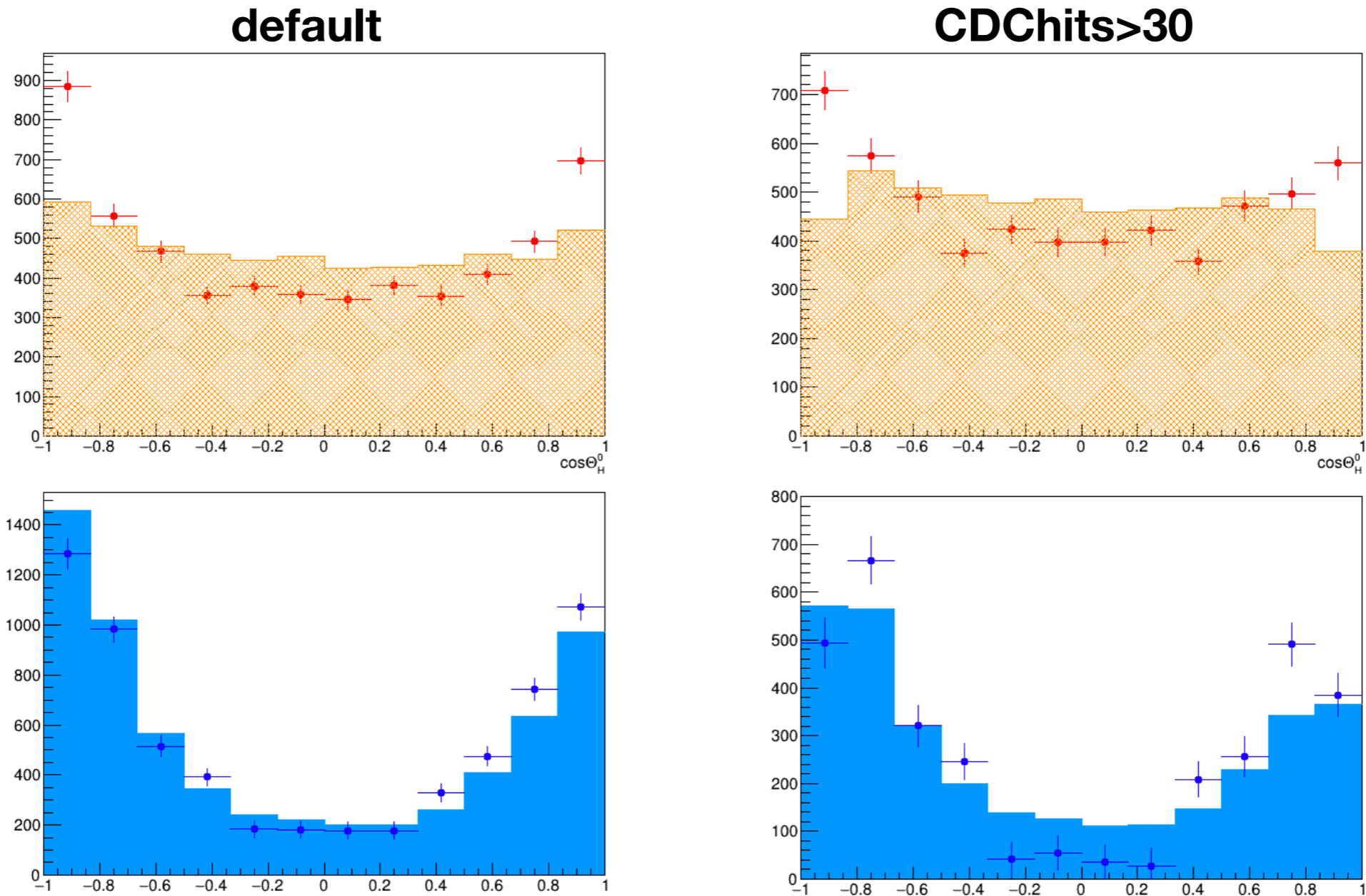

default

tight γ/π⁰ cuts

Not improved. BBbar even worsened.

CDC hits?

Mismodellings also in $\cosH(\rho^0)$, that is tracks only. Culprit is not only χ/π^0.
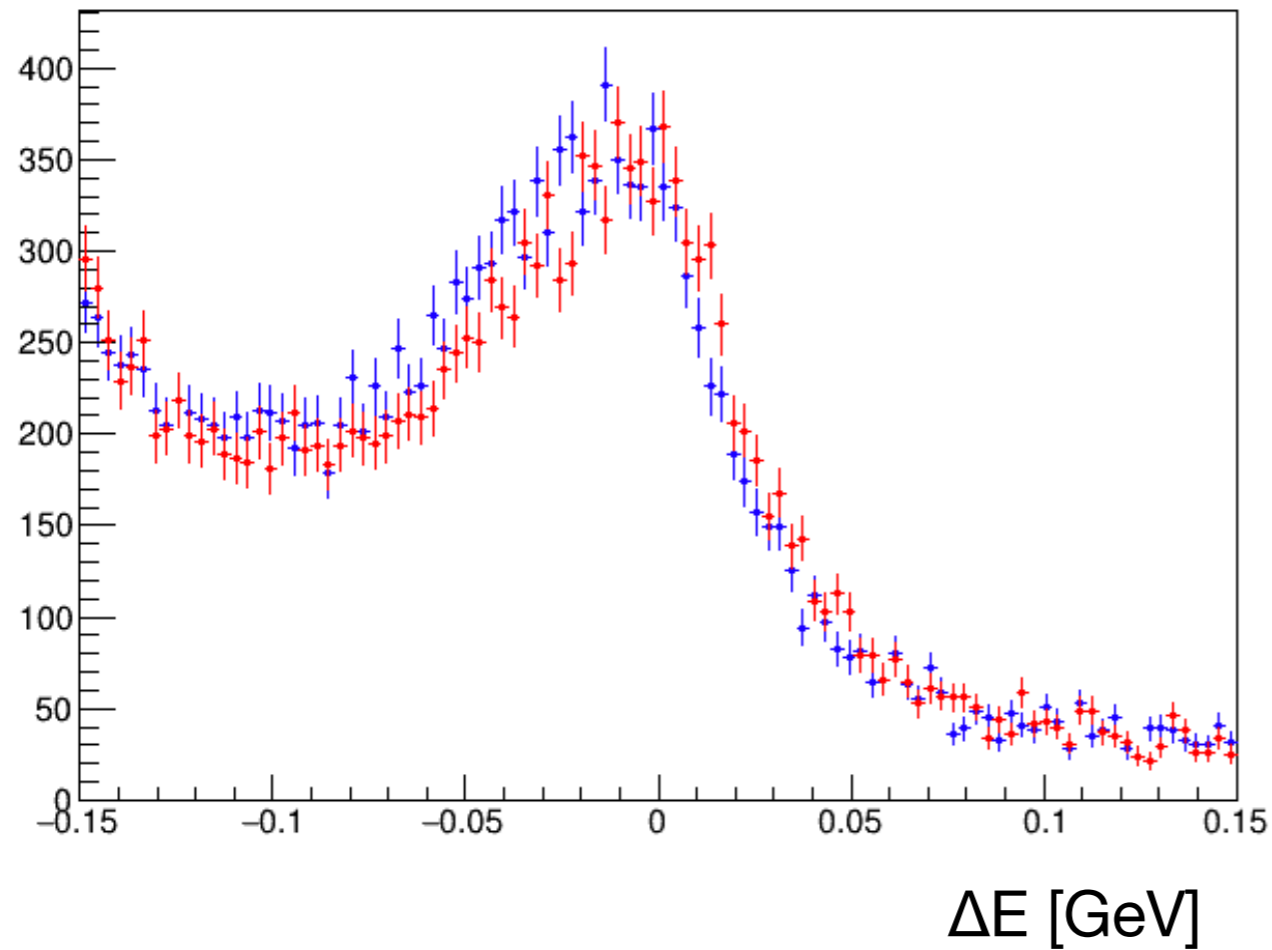What if we do the same exercise on CDC hits (since it's known for data-MC disagreement)?

default   **CDChits>30**

Cutting tight on CDC hits worsens the data-MC disagreement.

data w/ E(γ) corrections

Photon-corrected data

B→D⁰ρ

B→ρρ

Default
W/ γ correction

ΔE [GeV]
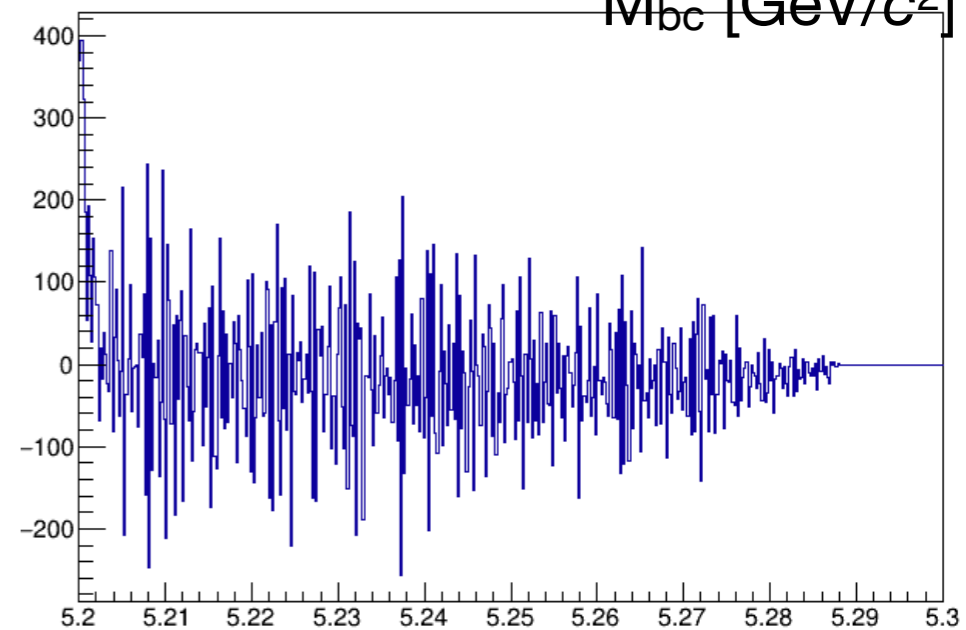
ΔE [GeV]
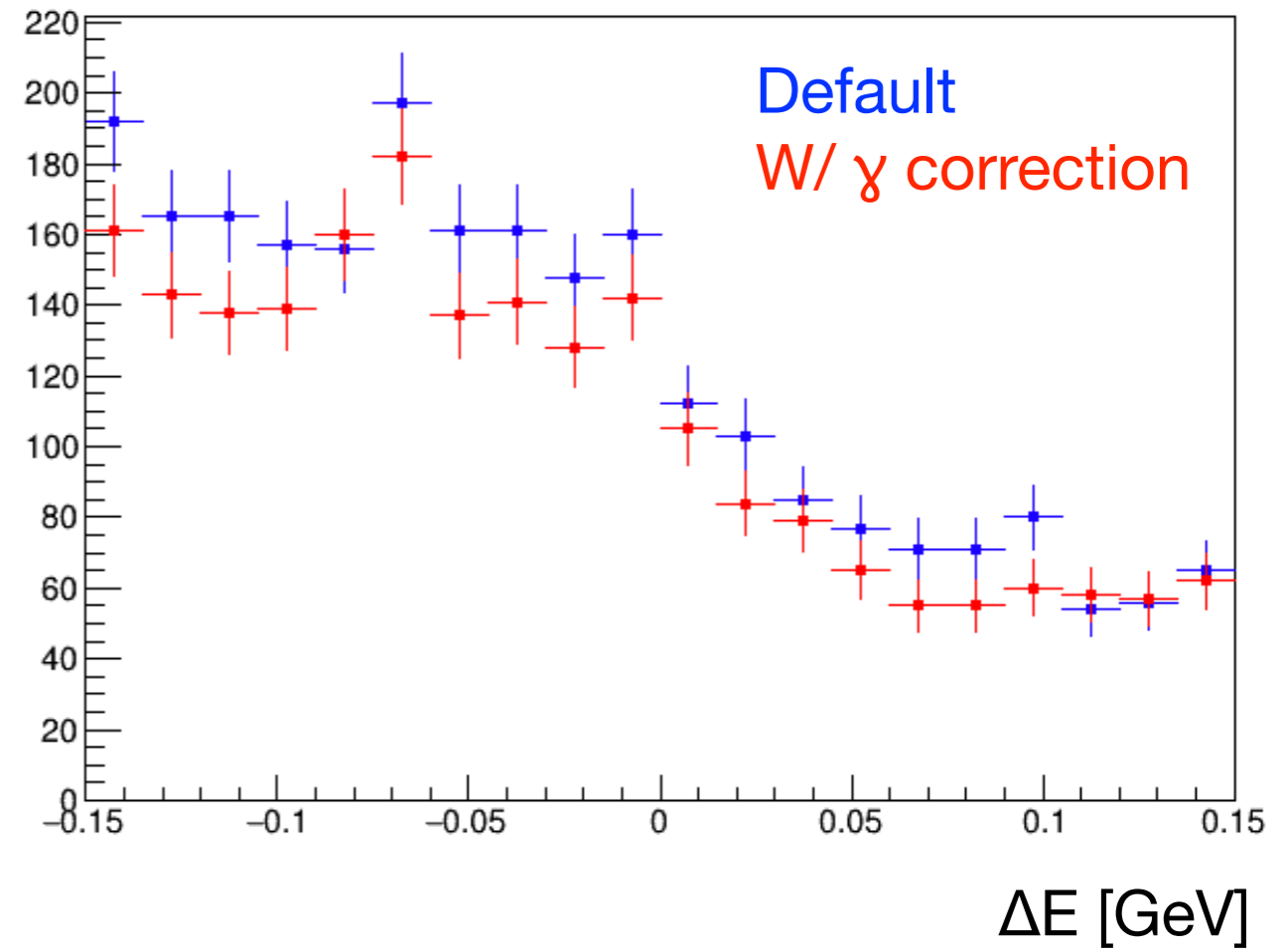
Corrections seems to work on *D⁰ρ* but not in *ρρ*.

Problems in $\rho\rho$?

Plots from "reduced" events: $|\Delta E|<0.3$ GeV + Mbc>5.24 GeV/c^2 + CS>0.75

experiment

Default
W/ ɣ correction

ΔE [GeV]
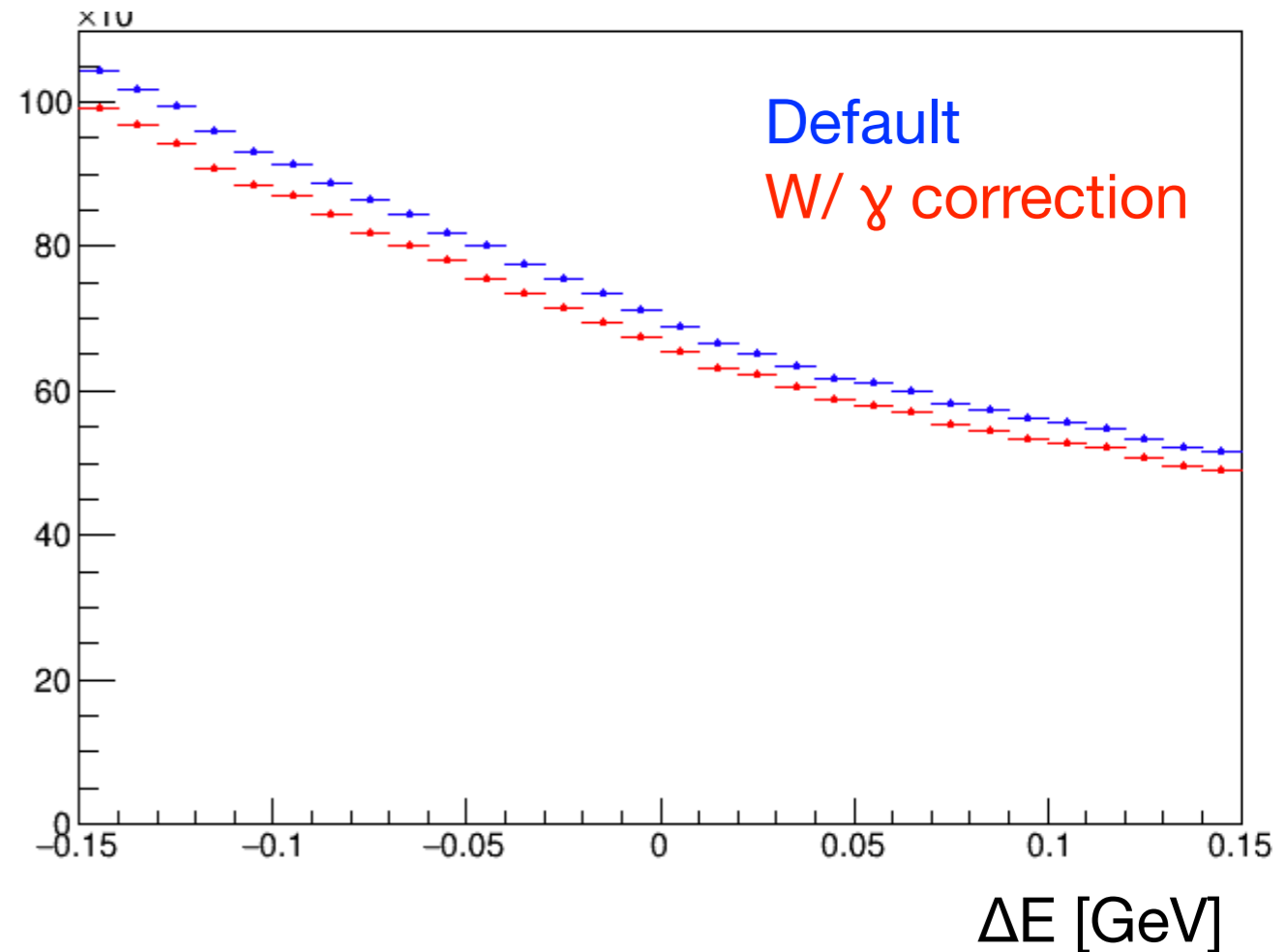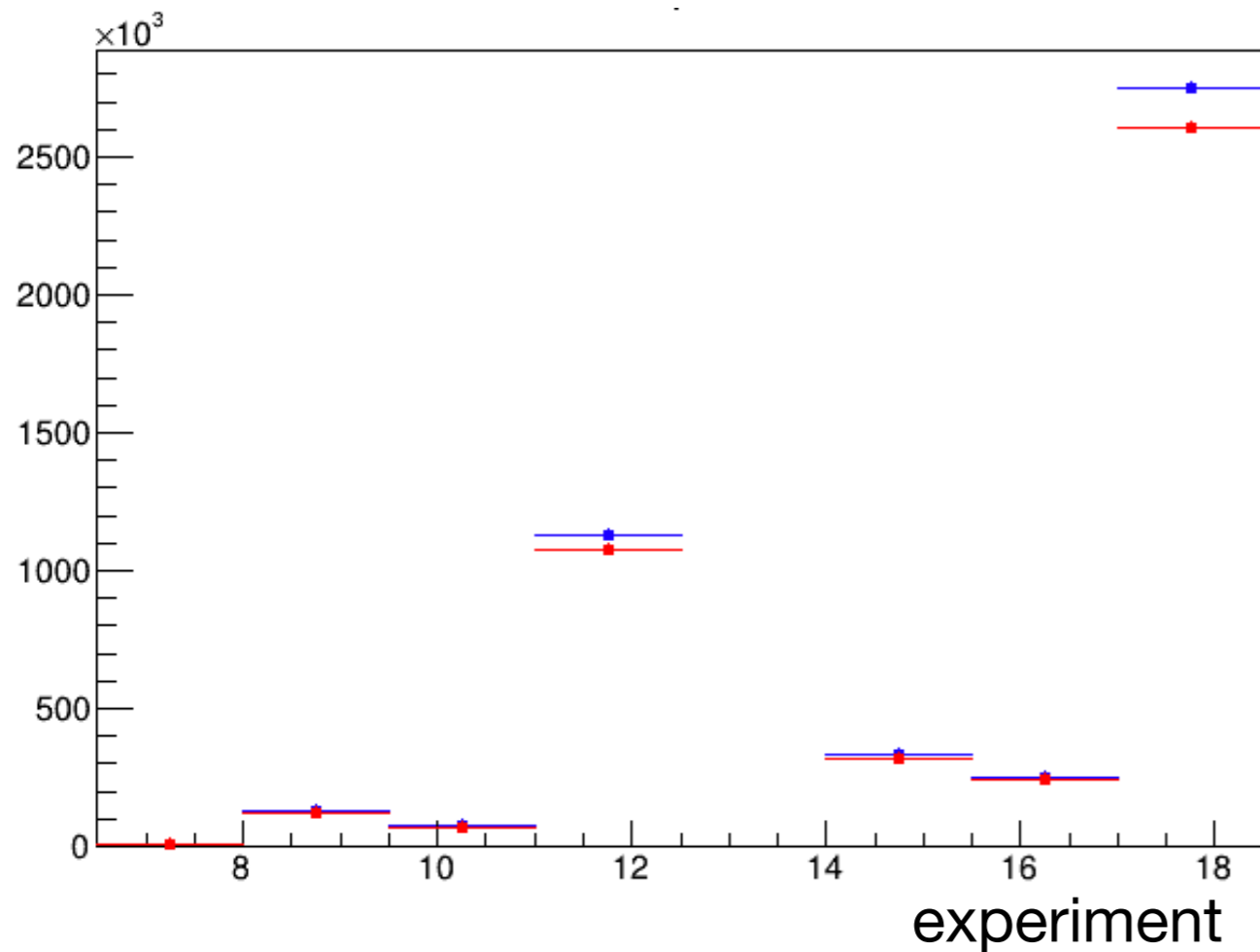
Inspect b18 only

Reco cuts only

Default
W/ γ correction

CS

CS

M_{bc} [GeV/c^2]

Default - corrected
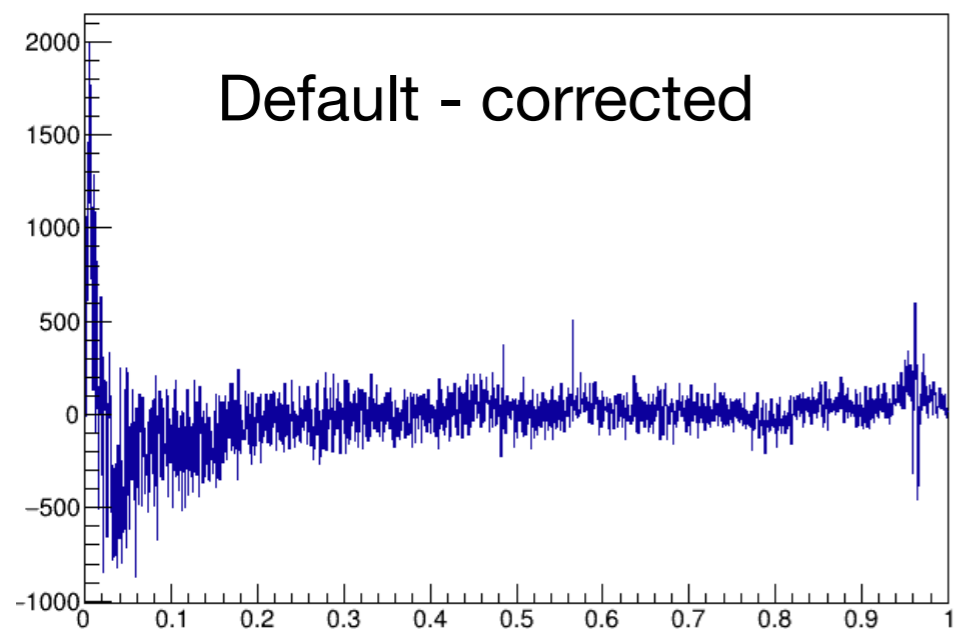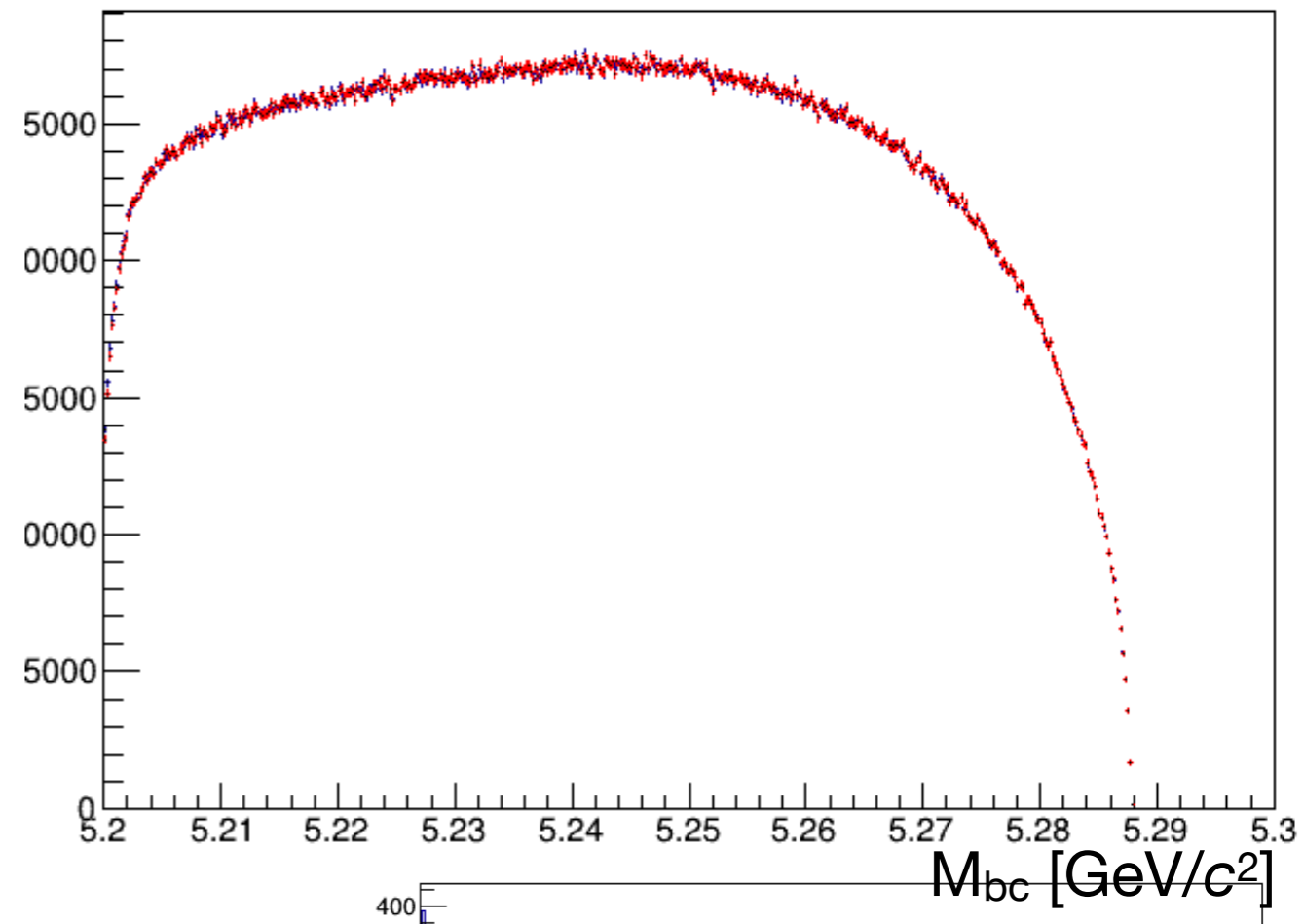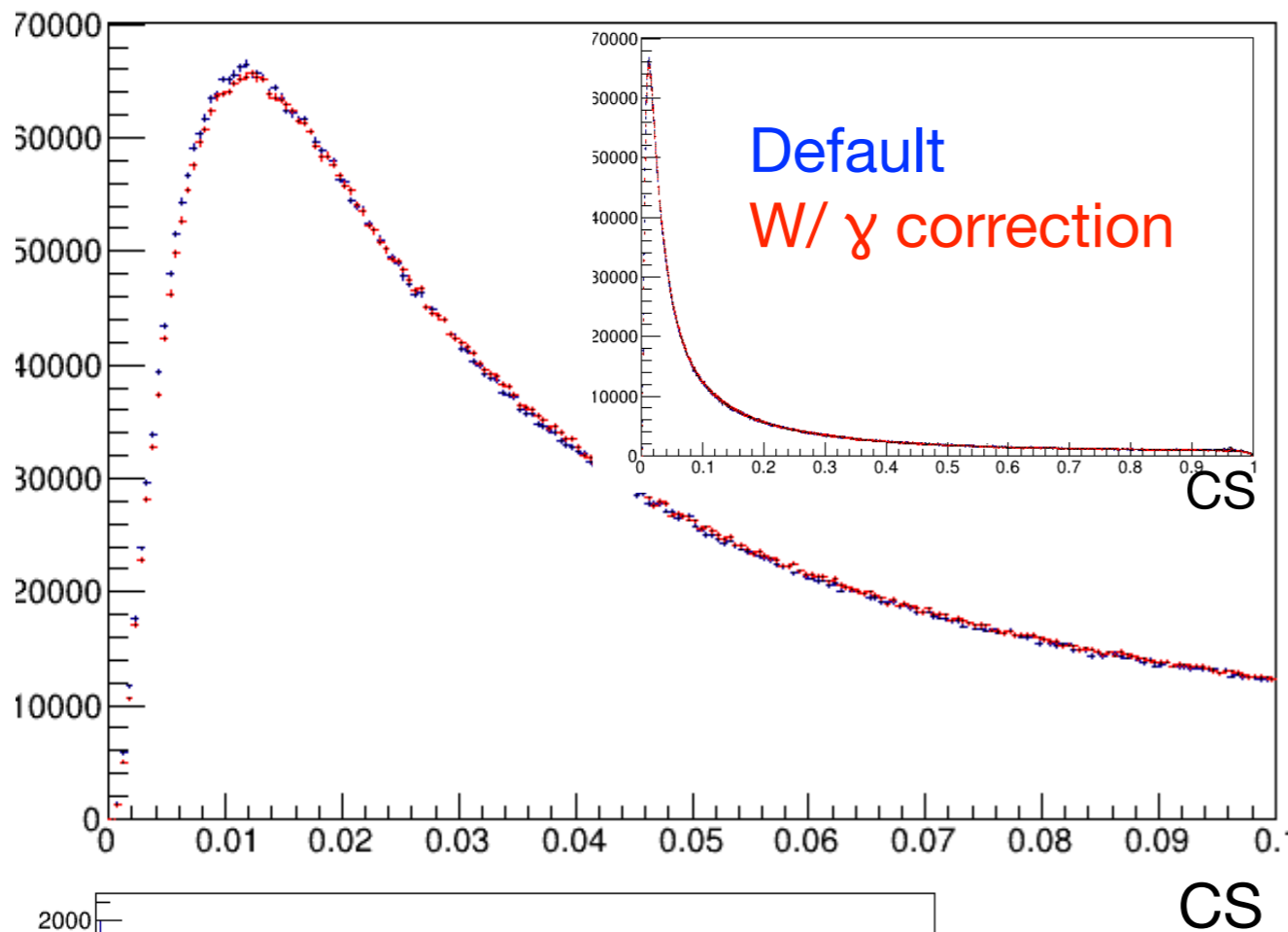
Lower yield may come from CS discrepancies at low values.
But why no peak shift?

Summary — action items

Division between real and fake ρ seems worth a try. Additional doubts because of the wrong modelling in the continuum.
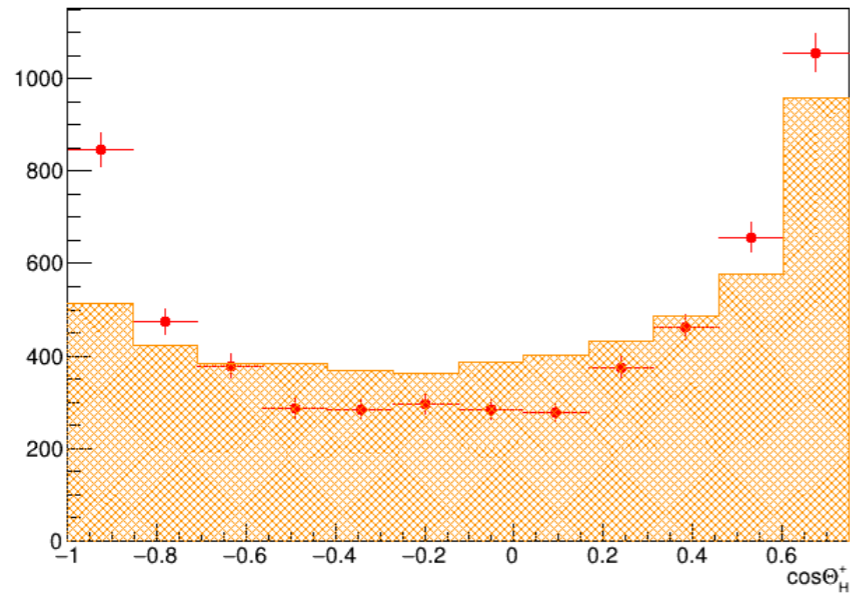
Tighter cuts on χ/π^0/tracks variables do not seem to improve the mismodelling.

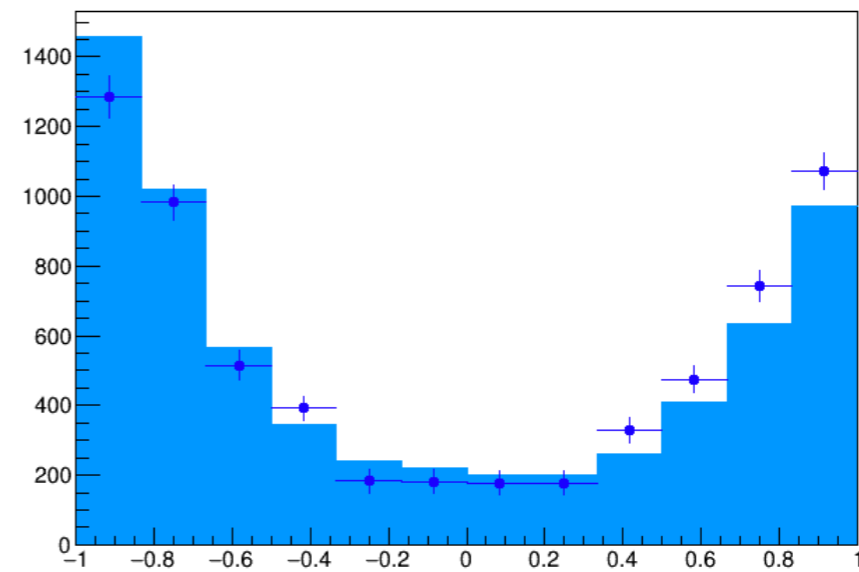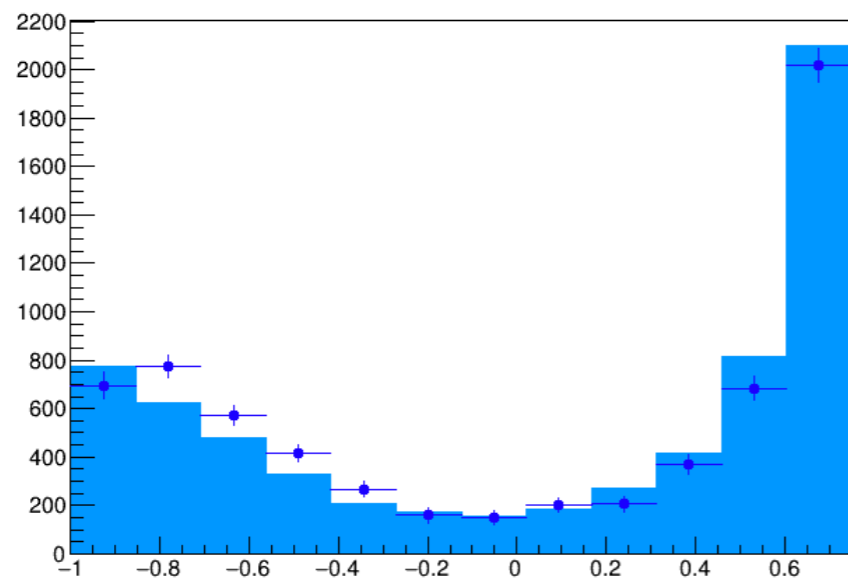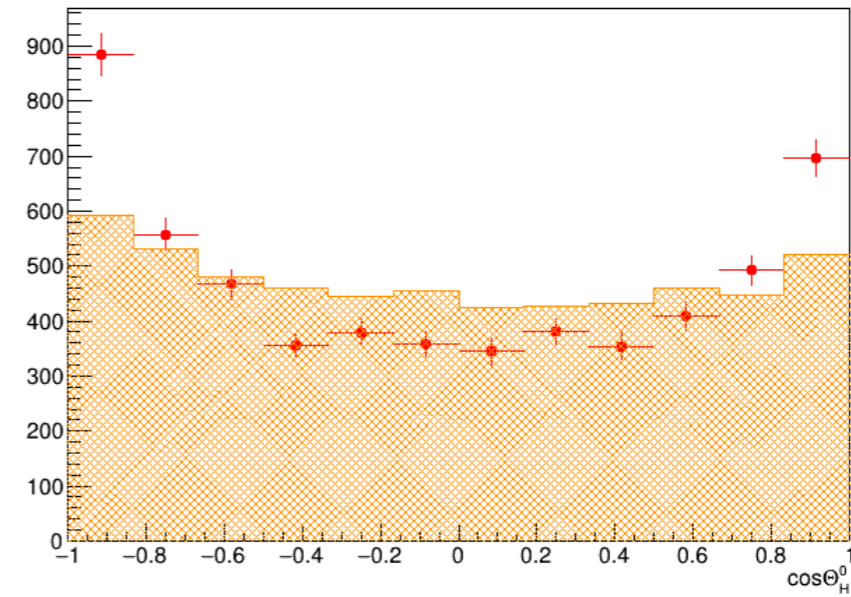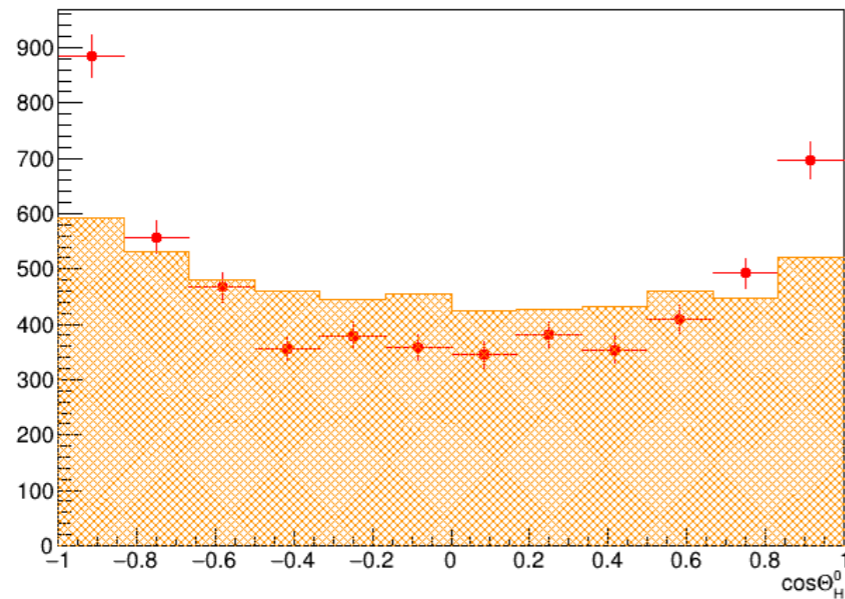Photon corrections seem not to work on $\rho\rho$. Still investigating.
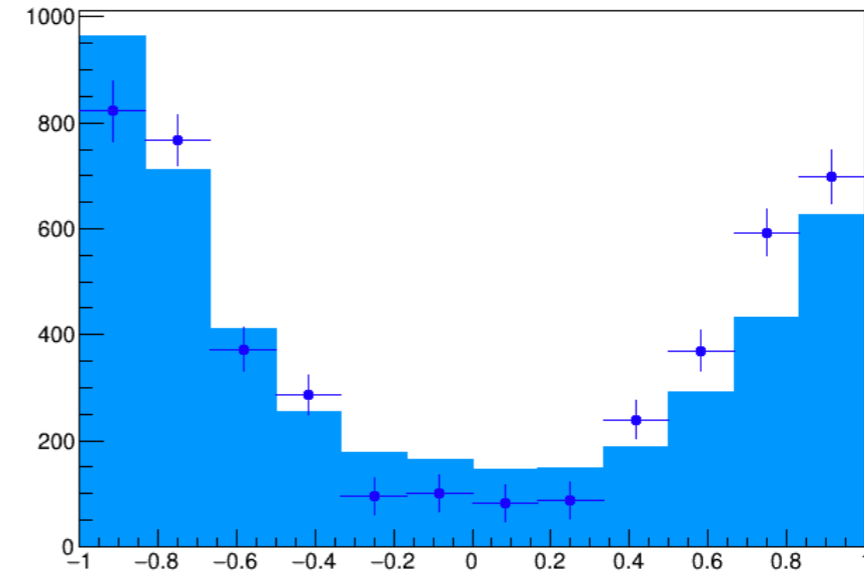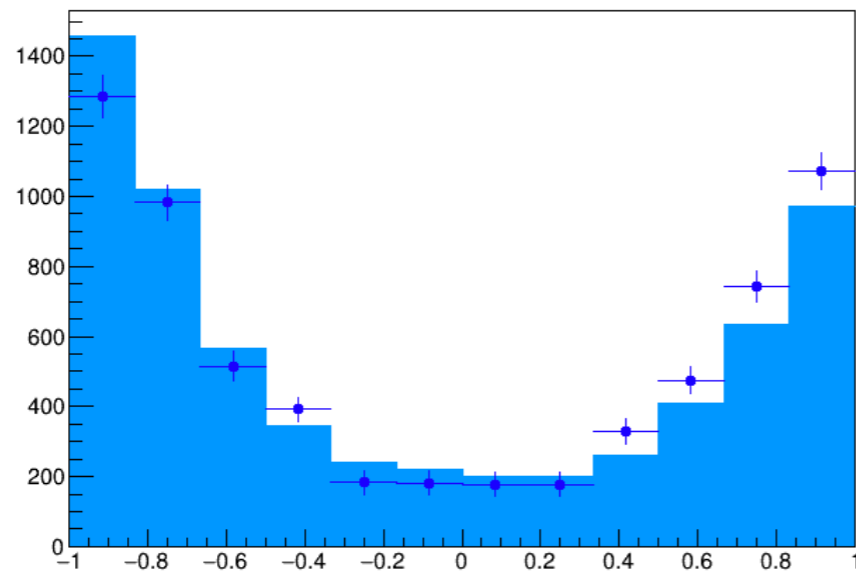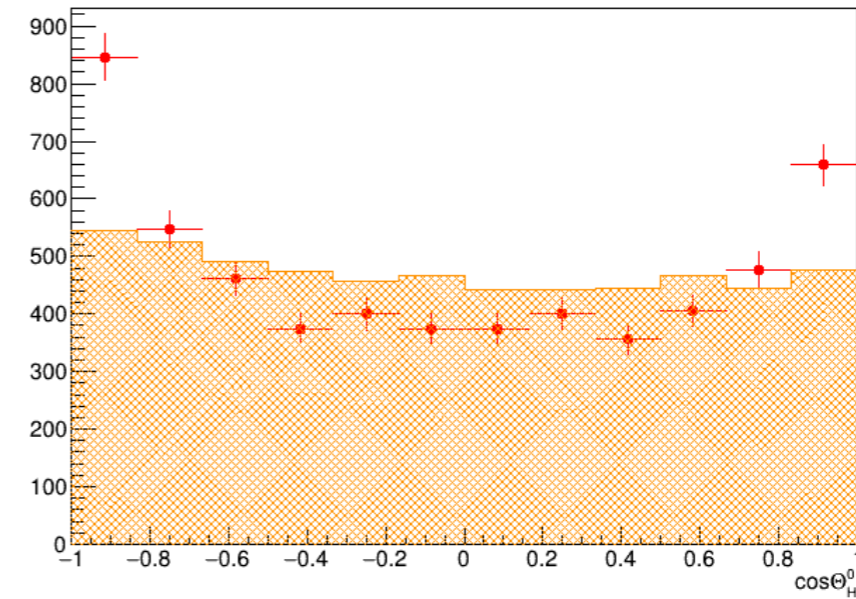
backup

Mismodellings

ρ^+

ρ^0

Tracks cosθ?

Mismodellings also in cosH(ρ^0), that is tracks only. Culprit is not only χ/π^0. Just as a check, try to cut mildly on cosθ of the tracks.

default   **-0.75<cosθ<0.85**

Slight worsening in both.