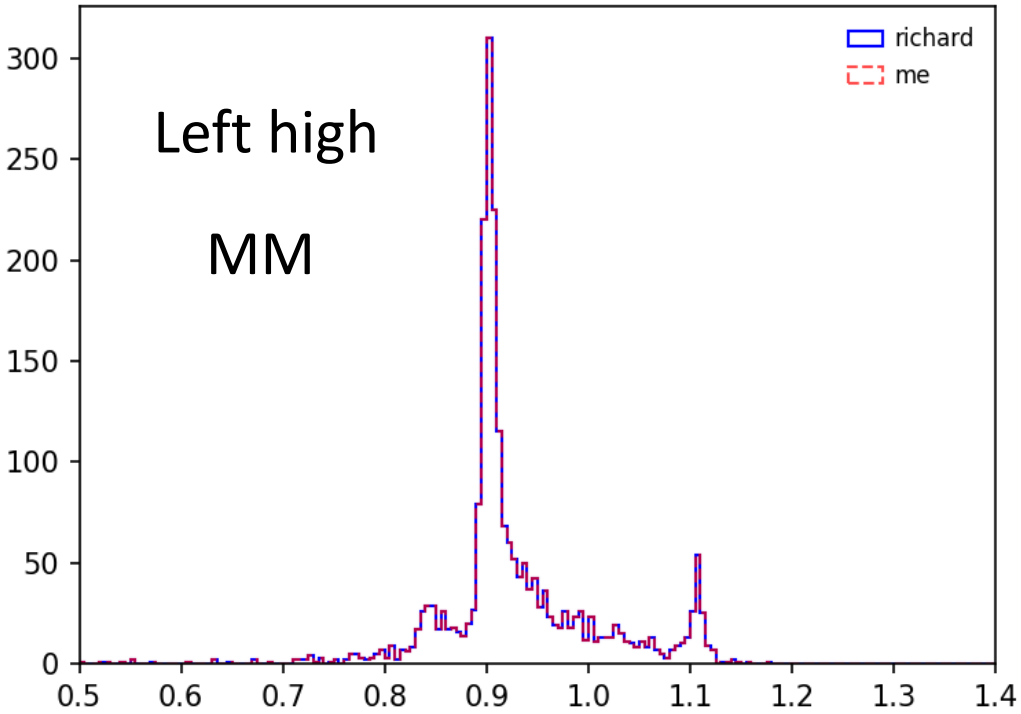
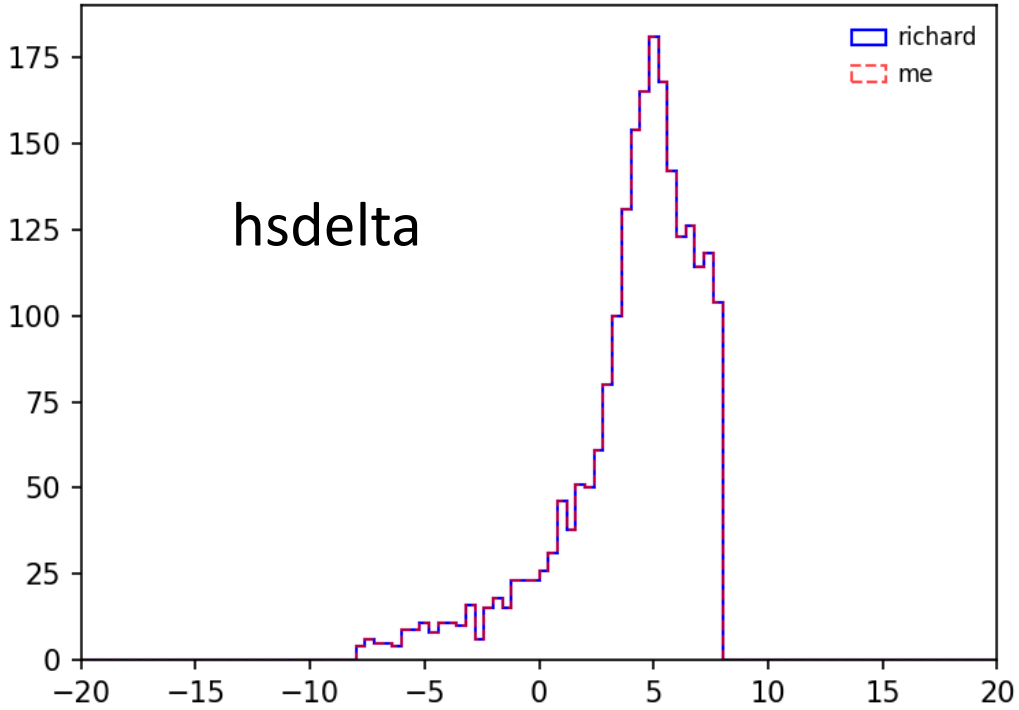
Comparing result with Richard Q^2=4.4, W=2.74 setting



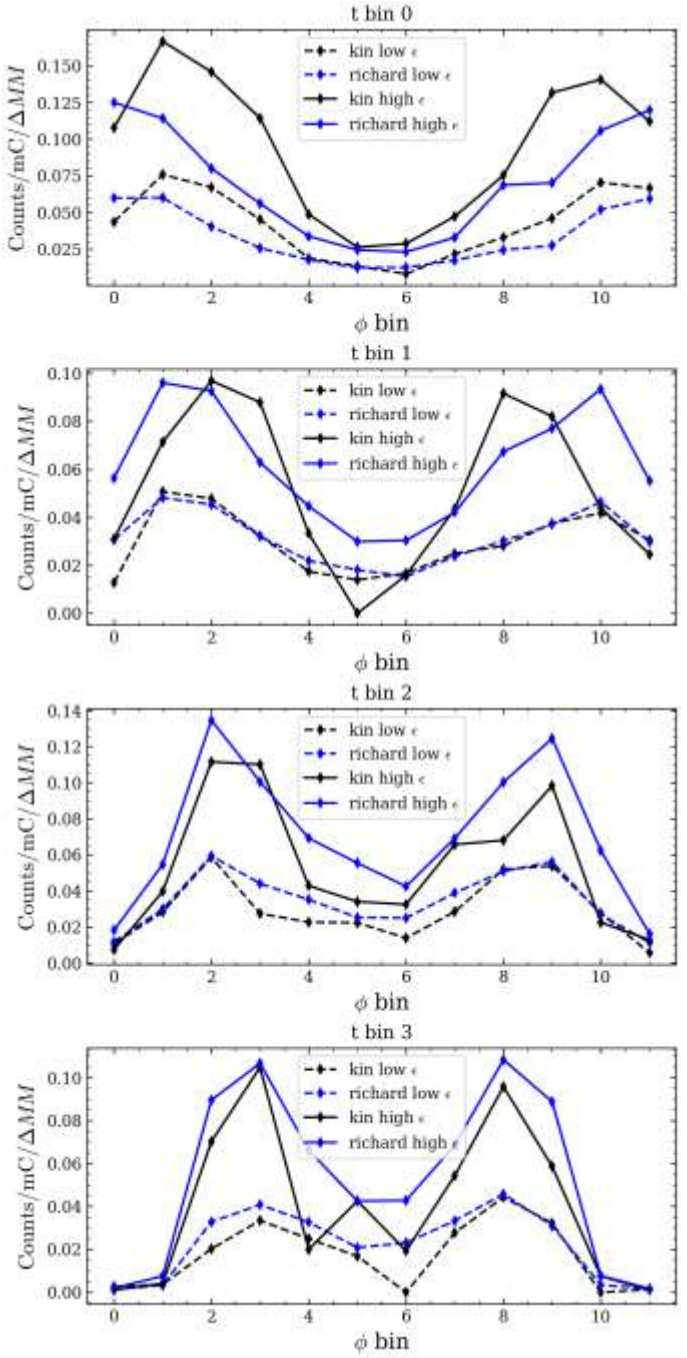


- Same result on kaon data (before any subtraction) but after applying all pid cuts, but no acceptance, hcger hole cut, diamond cut, etc
- Cant be compared now but hopefully these are small
  - diamond cut diff.
  - Richard's correction to hms-delta is outdated (slope term -5 which shd be -6,etc)

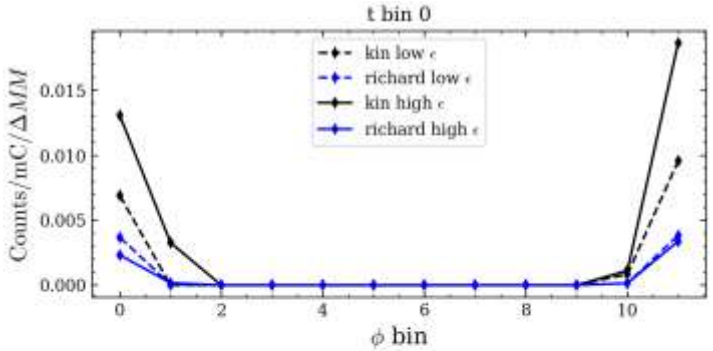
Comparing result with Richard Q^2=4.4, W=2.74 setting

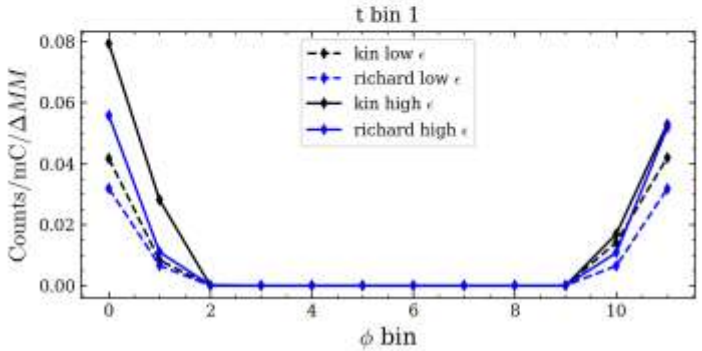
- Yields is normalized counts /mC
- Similar shape in most case but my yields are less smooth

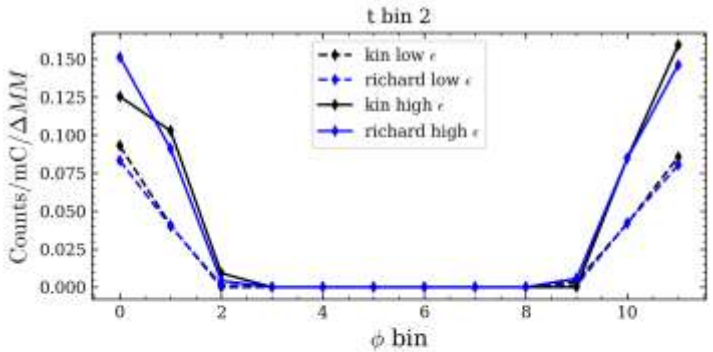
```
def calculate_yield_data(kin_type, hist, t_bins, phi_bins, inpDict):
    i=0 # iter
    print("-"*25)
    # Subtract binned_hist_dummy from binned_hist_data element-wise
    for data, sub in zip(binned_hist_data, binned_hist_sub):
        j = i // nphi
        k = i %  nphi
        bin_val_data, hist_val_data = data
        bin_val_sub, hist_val_sub = sub
        bin_width_data = np.mean(np.diff(bin_val_data))
        arr_data = np.array(hist_val_data)
        bin_width_sub = np.mean(np.diff(bin_val_sub))
        arr_sub = np.array(hist_val_sub)
        try:
            yld = np.sum(arr_data)/bin_width_data
            #print(f"{i} | DATA Yield: {yld:.3e} =  NumEvts: {np.sum(arr_data):.3e}
            # Calculate experimental yield error (relative error)
            # Divide by norm factor to cancel out since we need raw counts
            yld_data_err = np.sqrt(data_charge_err**2+(1/np.sqrt(np.sum(arr_data/no
```

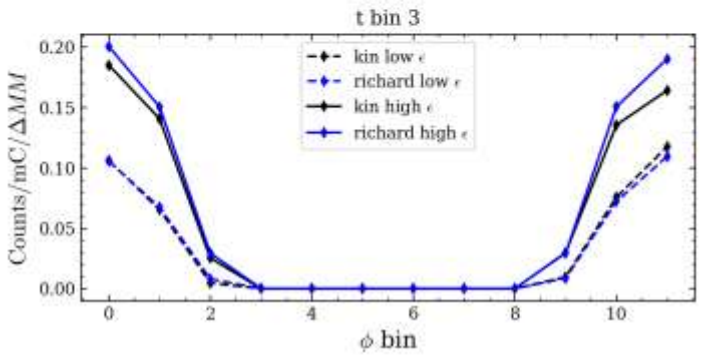


Left

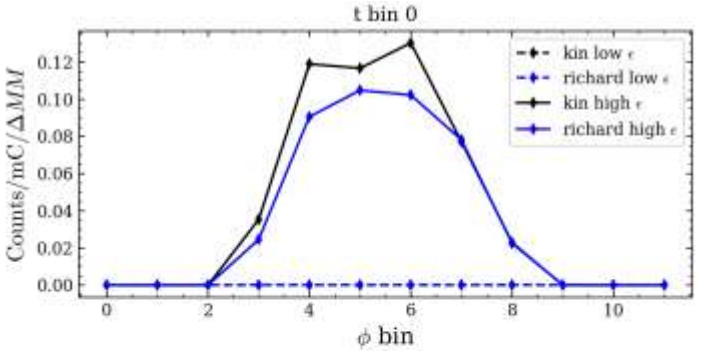

t bin 0
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

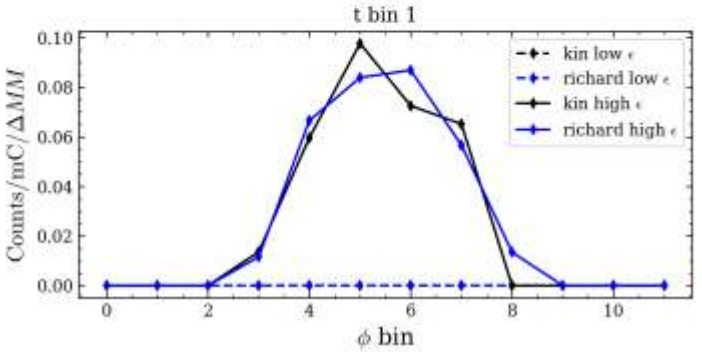

t bin 1
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

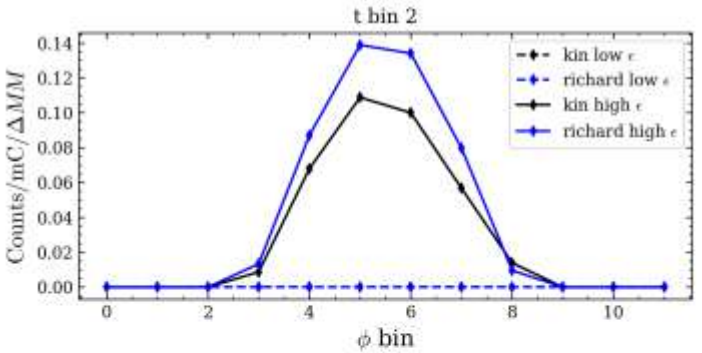

t bin 2
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

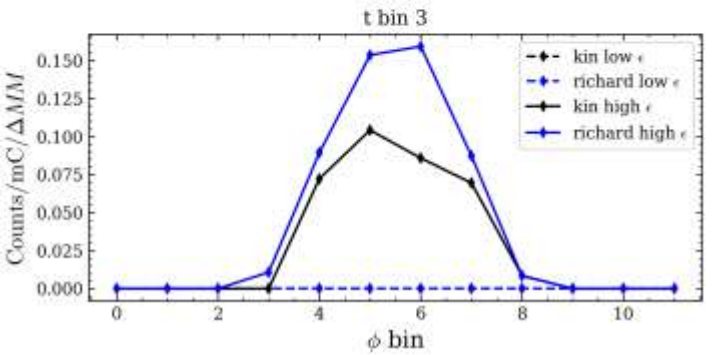

t bin 3
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

Right


t bin 0
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

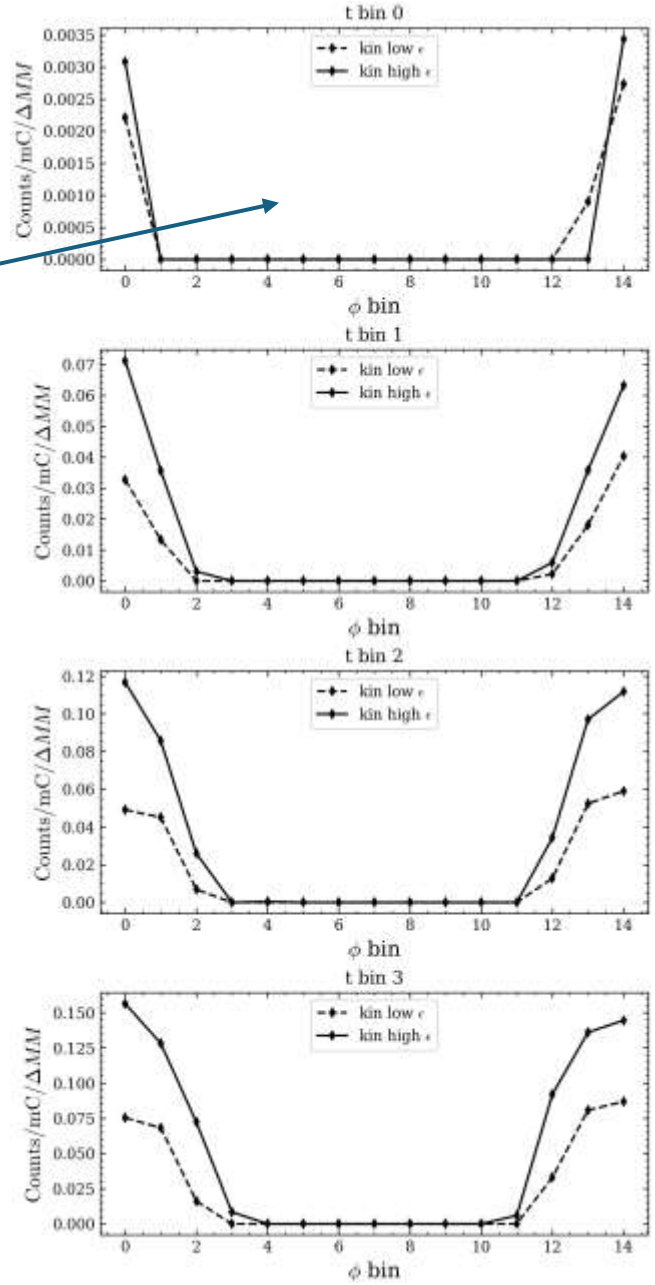

t bin 1
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin


t bin 2
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

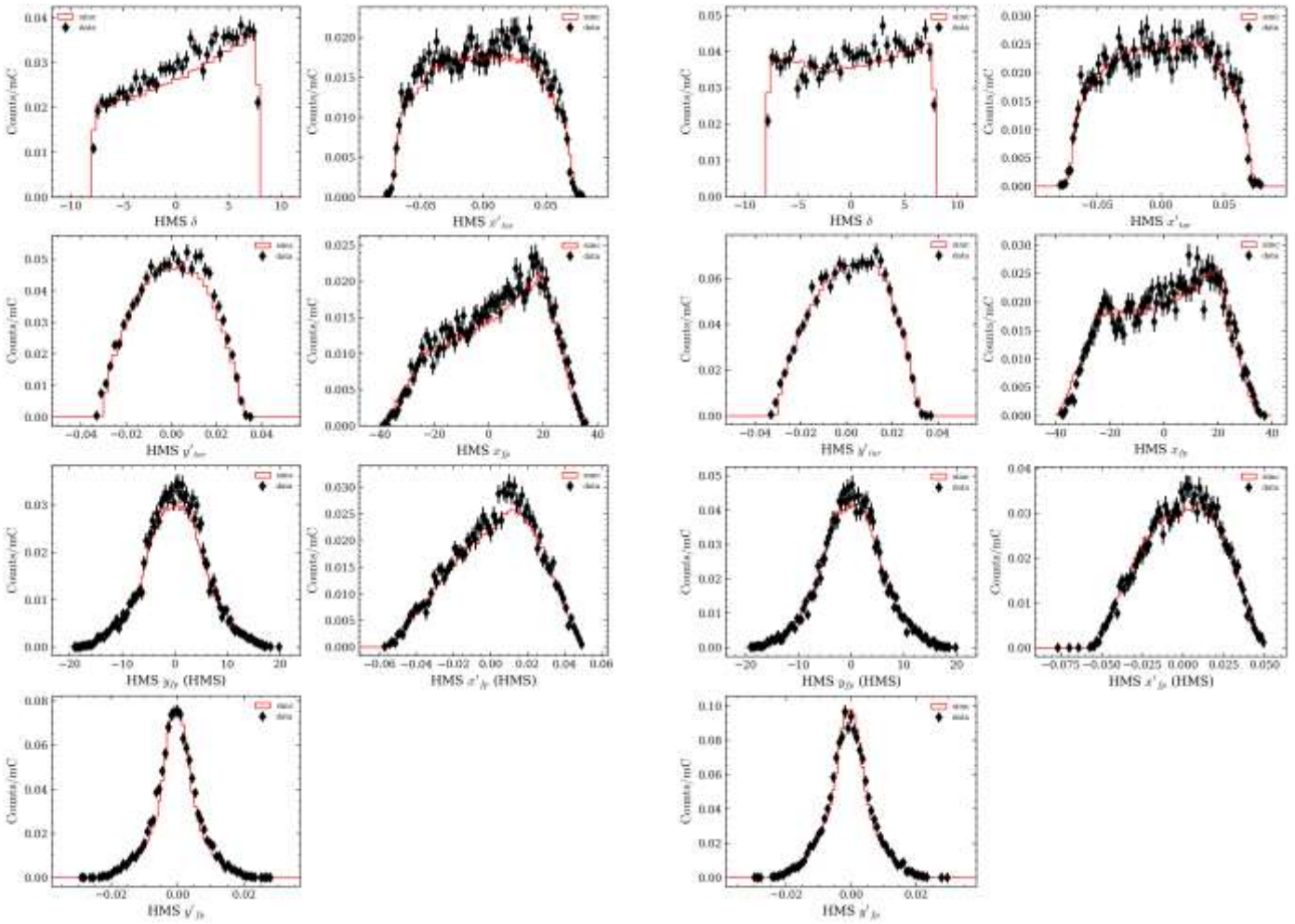

t bin 3
kin low ϵ
richard low ϵ
kin high ϵ
richard high ϵ
Counts/mC/ΔMM
ϕ bin

Back to Q^2=3.0, W=3.14

- Undo mm shift in simc
- Change the t bins to make the first bin larger
  - (initially 0 in this bin for the high e setting)

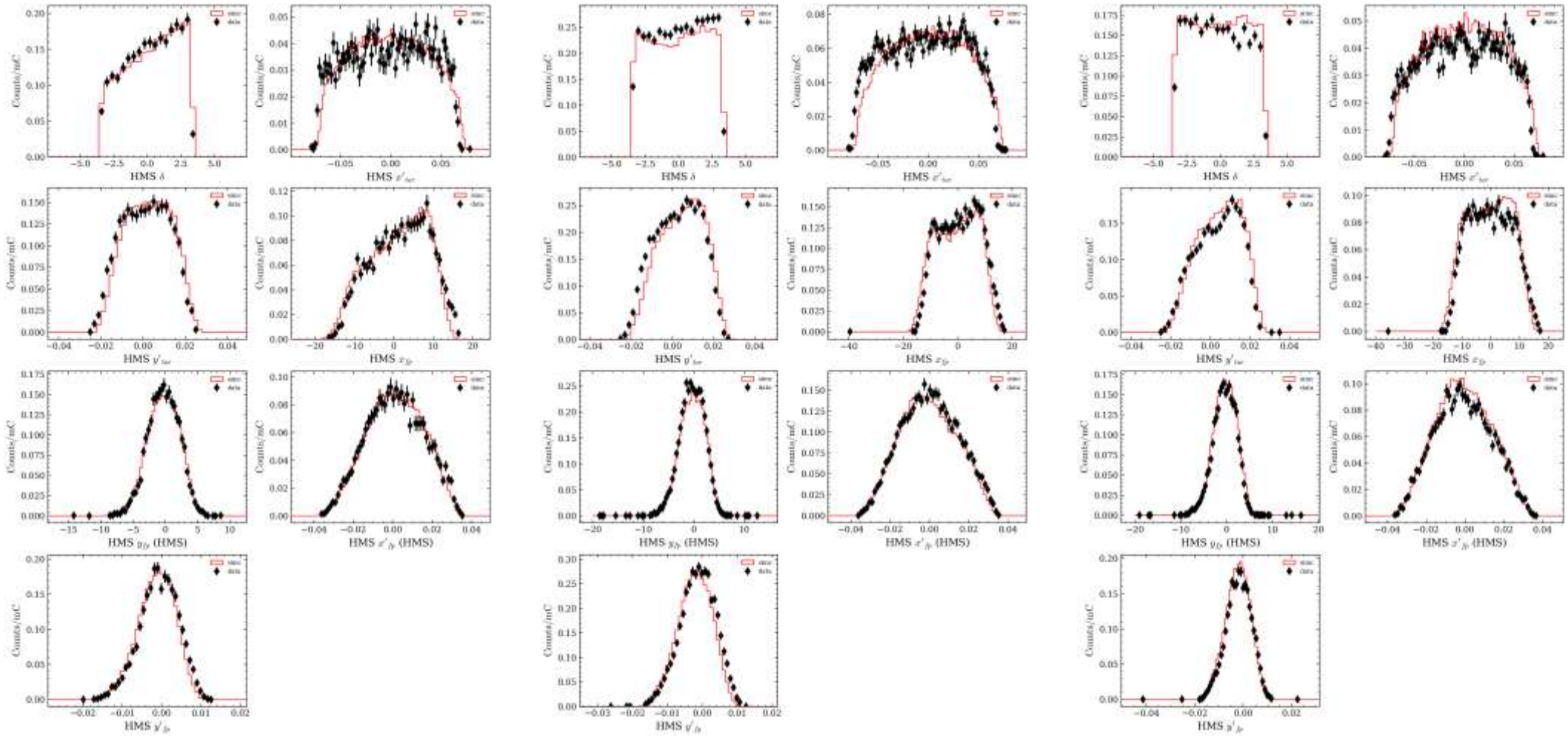


HMS distributions (iter 1, lowe)



- Weird SIMC distribution observed before is due to unphysical CS parameters evaluated at large -t. Now, a cut on |-t| (full range in our binning) is applied.

HMS distributions (iter 1, high e)



Fitting issue

- Still running into local/unphysical minima for the sigmaTT term

- Running:
  - Changed the functional form $\frac{p_4}{|t|^{p_5}}\exp(-|p_6 t|)$ to $p_4\ \exp(-p_5 \ln|t|\ -|p_6 t|)$
  - Random sampling the initial parameters →pick one of the fit
  - While each sigma is fitted independently, the total cs is calculated at the end. If negative in our |t| range, redo the fits.