

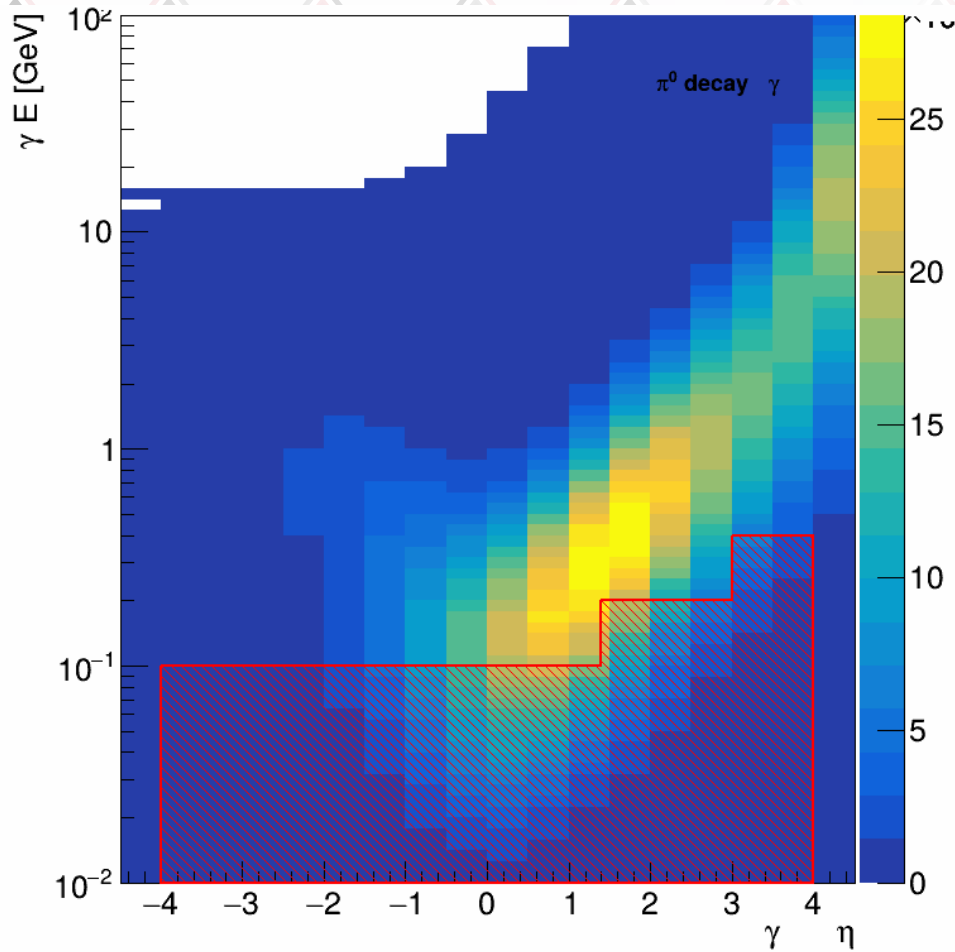
Low energy EM particles

Ralf Seidl (RIKEN)

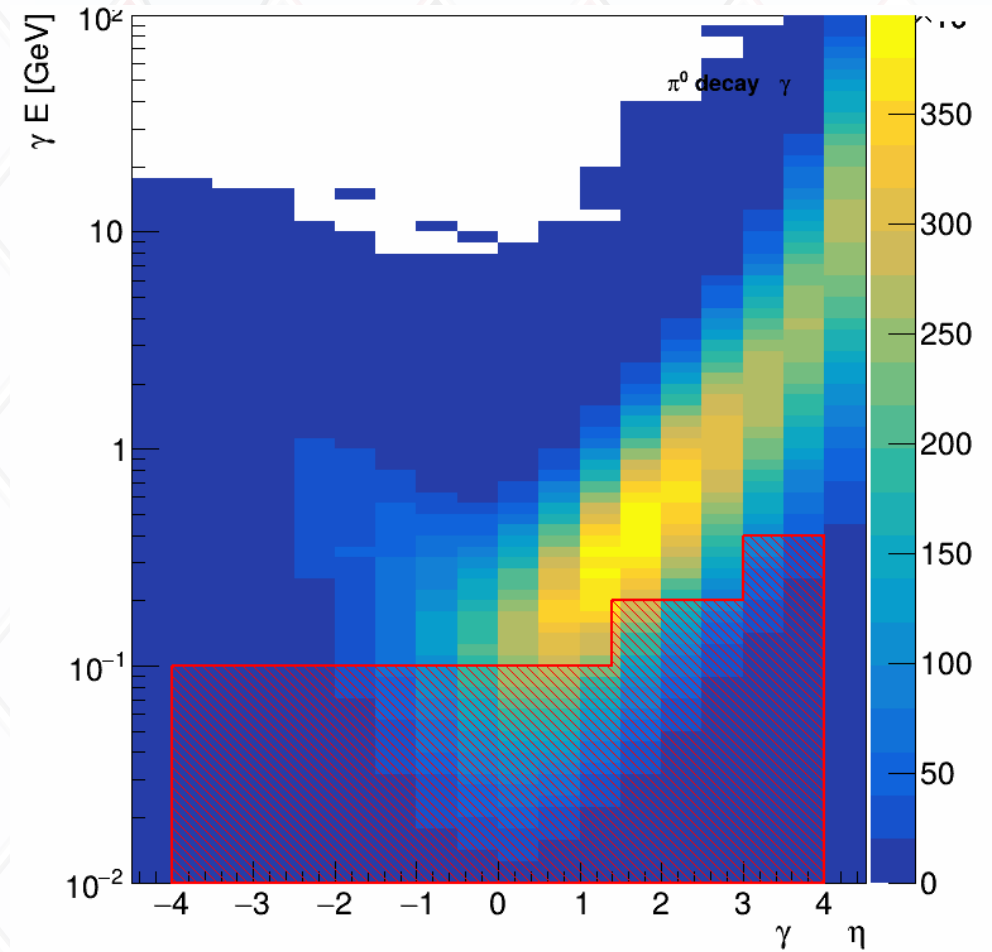
Rough cross section estimates based on event numbers

- All based on the MCParticle Branches of the 25.03.1 Production (DIS/NC/... and SIDIS/.../q2_0to1) 18x275 (and 5x41 in the backup slides)
- Assumption to have EMCal coverage
 - above 100 MeV for $-3.5 < h < 1.4$
 - above 200 MeV for $1.4 < h < 3$
 - above 400 MeV for $h > 3$
- Check impact on π^0 coverage and $\Sigma (\rightarrow \Lambda \gamma)$ coverage

Total distributions for photons from π^0 in lab energy

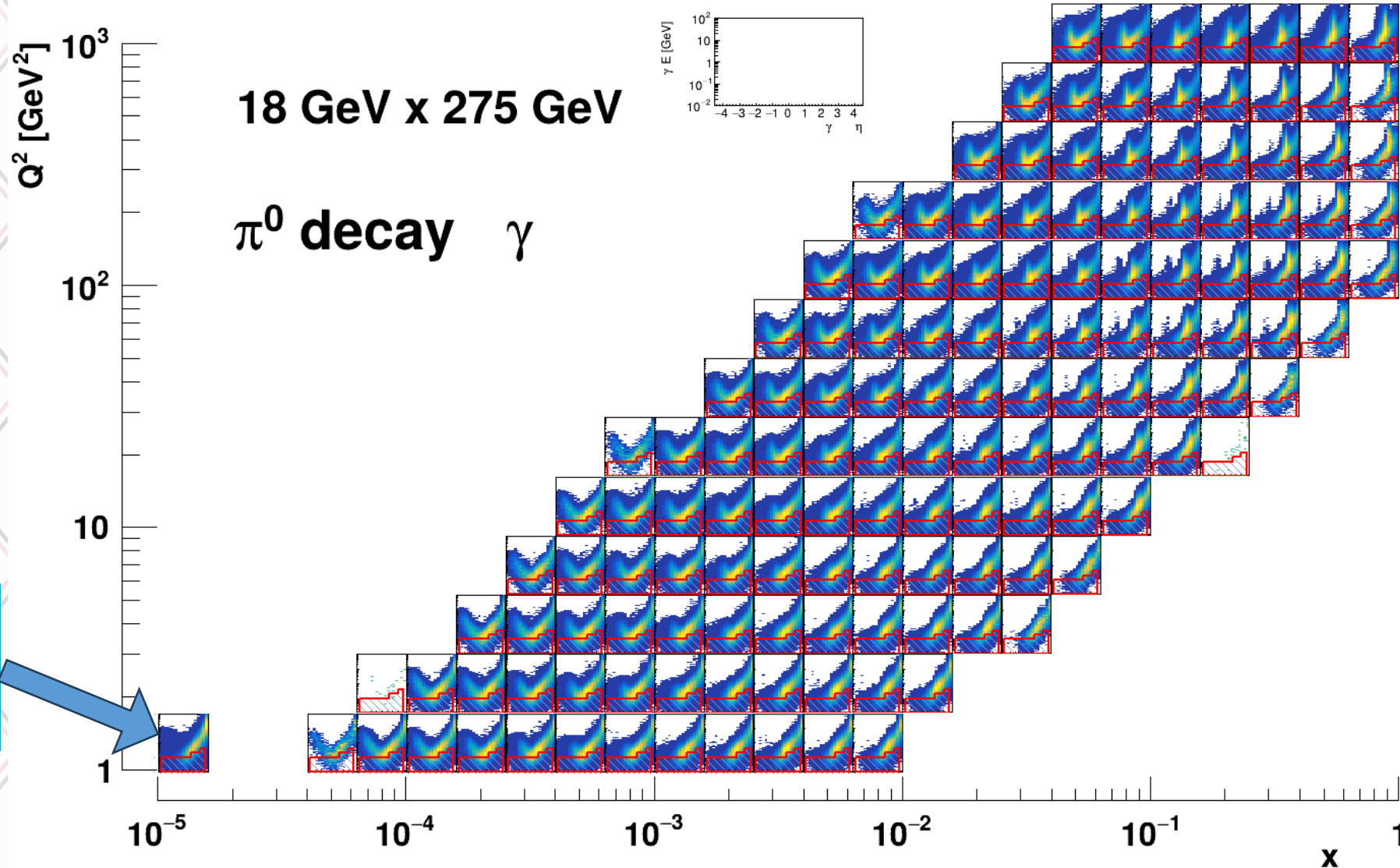


DIS/NC w/DIS cuts

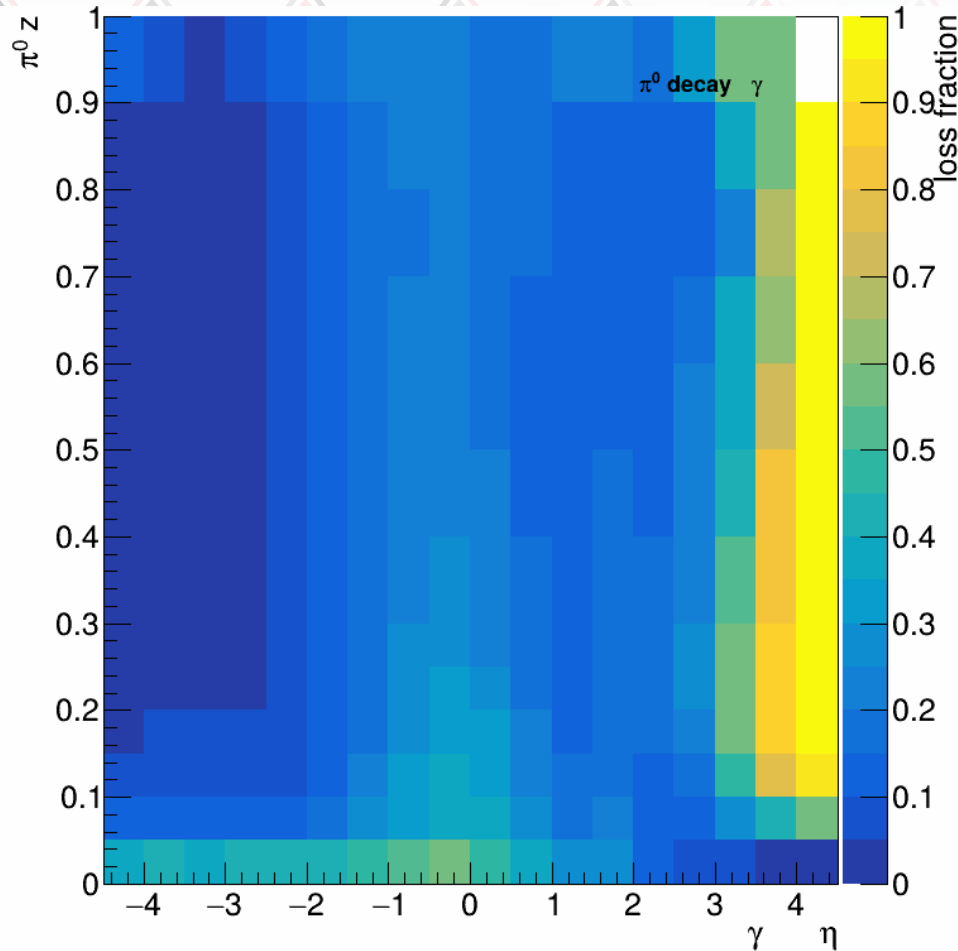


SIDIS/ $q^2_{0\text{to}1}$, w/o DIS (x, Q^2, y, W cuts) cuts

DIS π^0 decay γ events in x/Q^2 binning



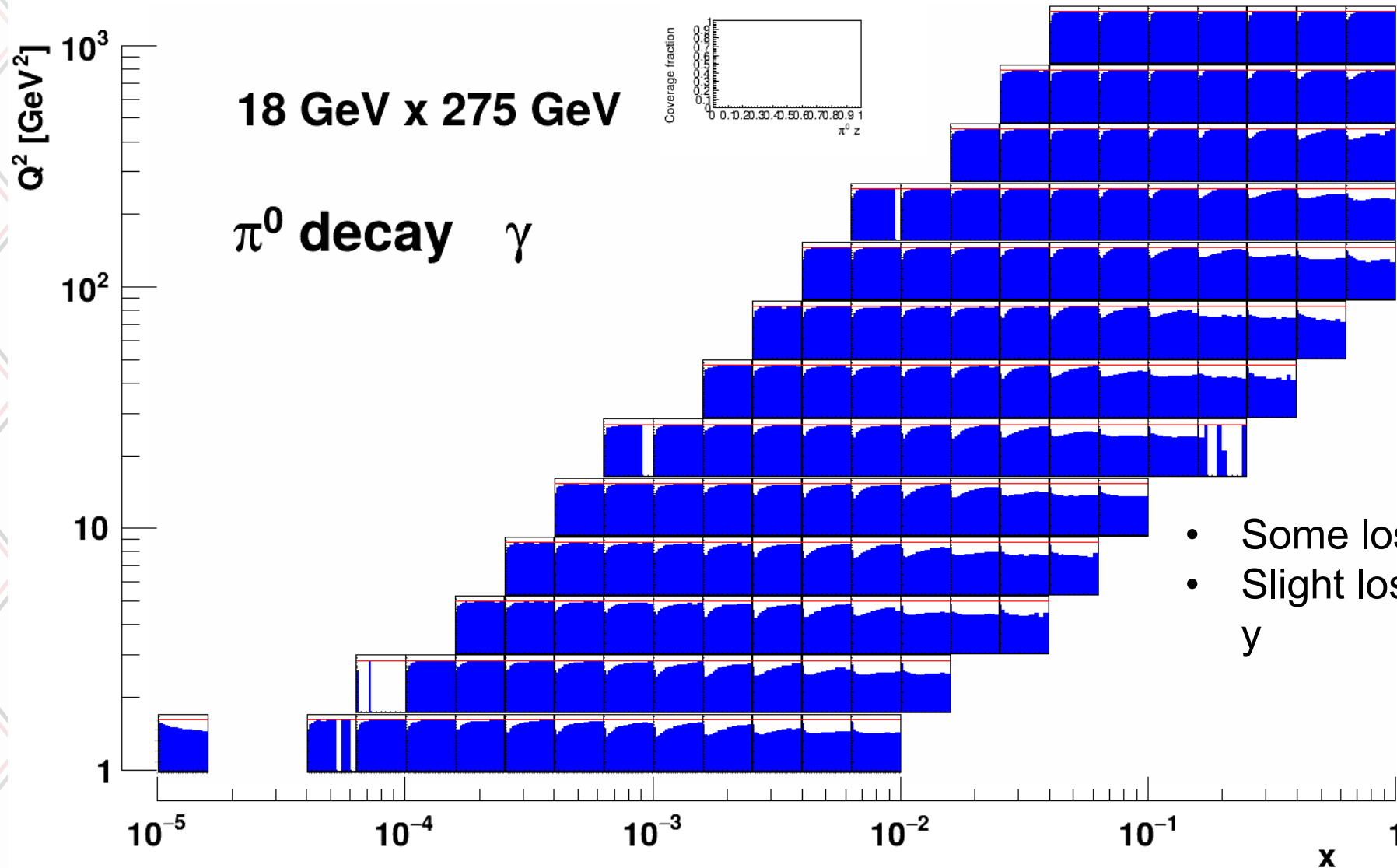
Total loss fraction for photons from π^0 vs z



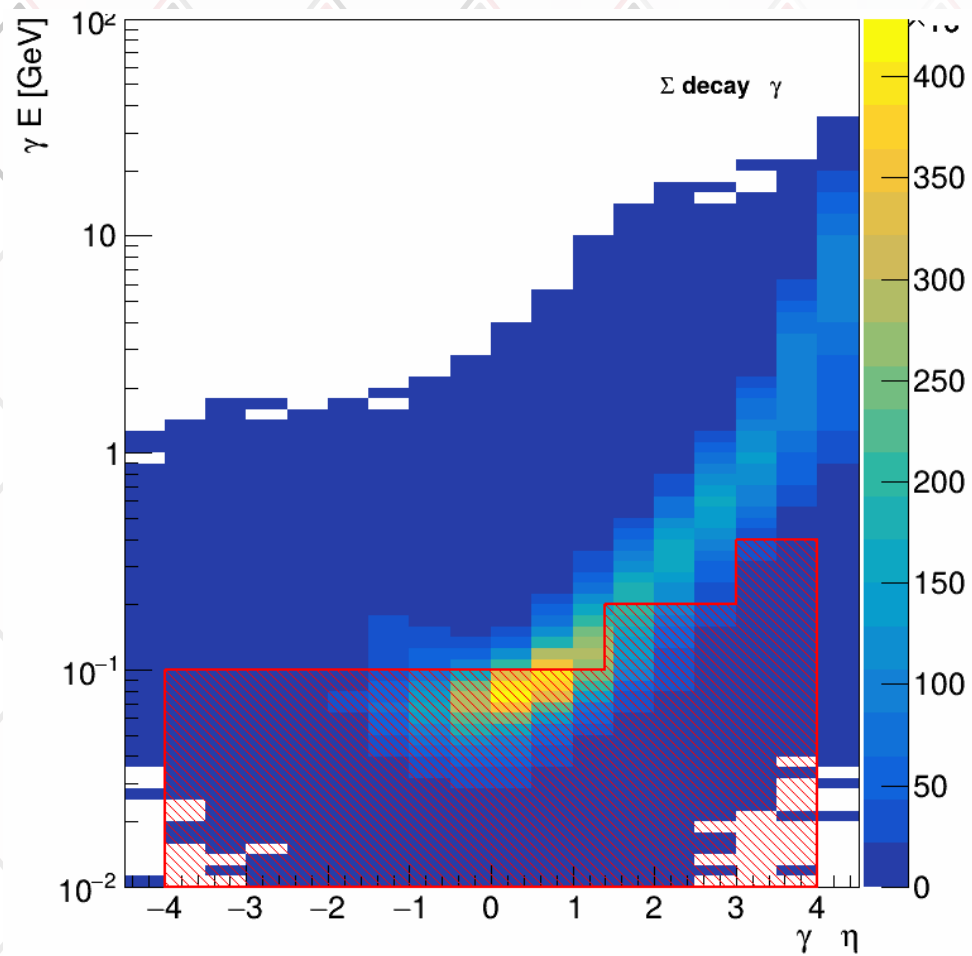
DIS/NC w/DIS cuts

- As expected, very little loss of SIDIS π^0 and for the most part at low z which is not as important for SIDIS physics
- Some losses at very forward rapidities that are likely not much covered anyway

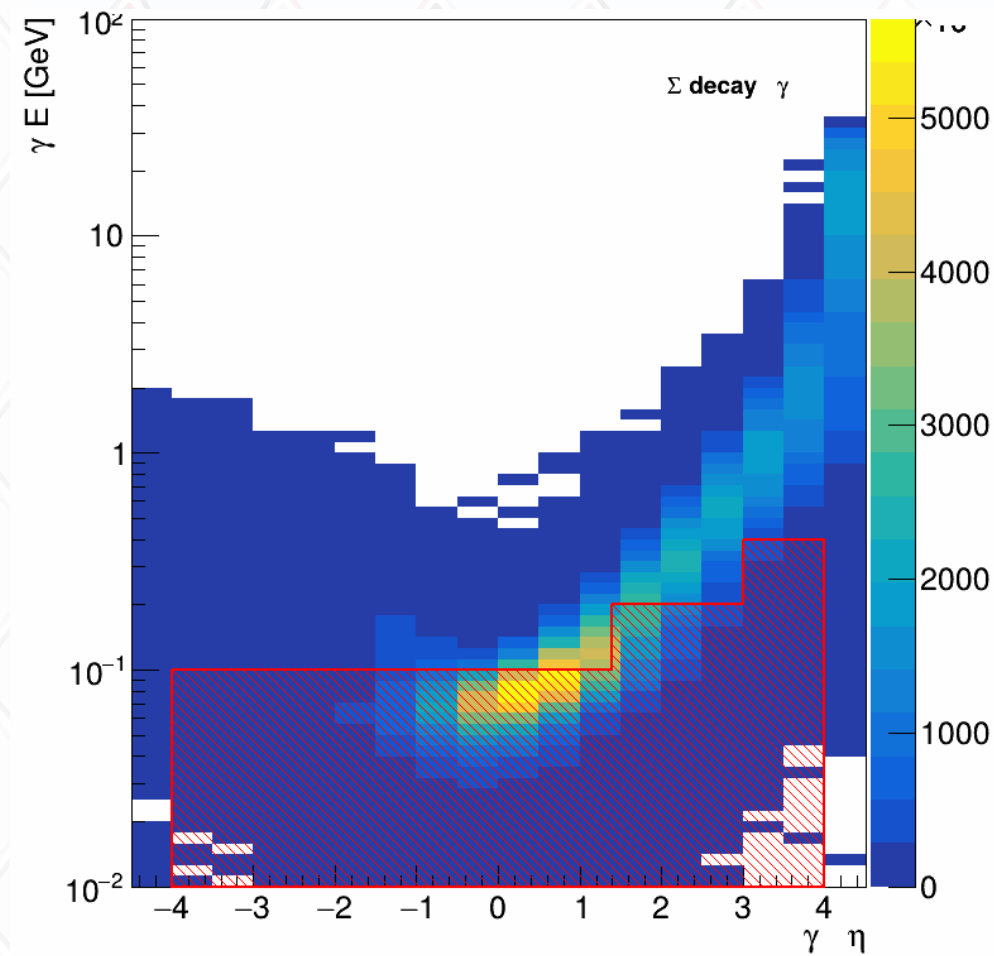
Raw DIS π^0 decay γ coverage fraction vs z only in x/Q^2 binning



Σ^0 events

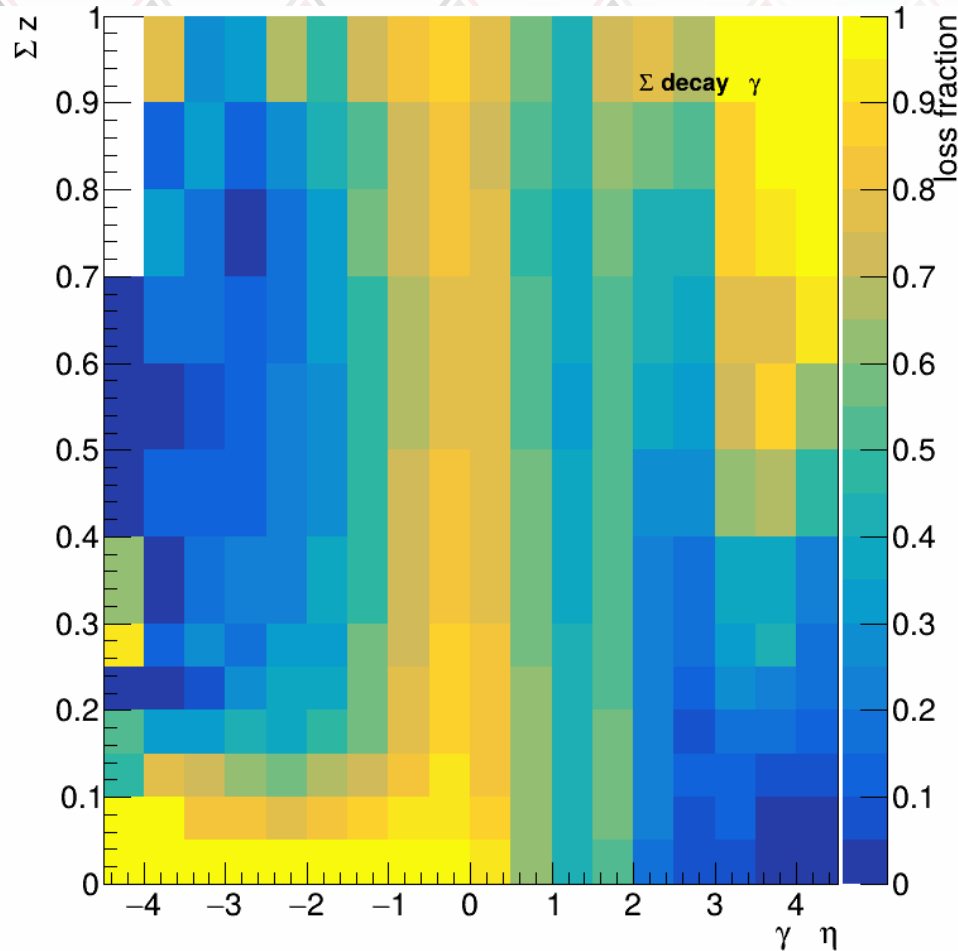


DIS/NC w/DIS cuts



SIDIS/ $q^2_{0\text{to}1}$, w/o DIS (x, Q^2, y, W cuts) cuts

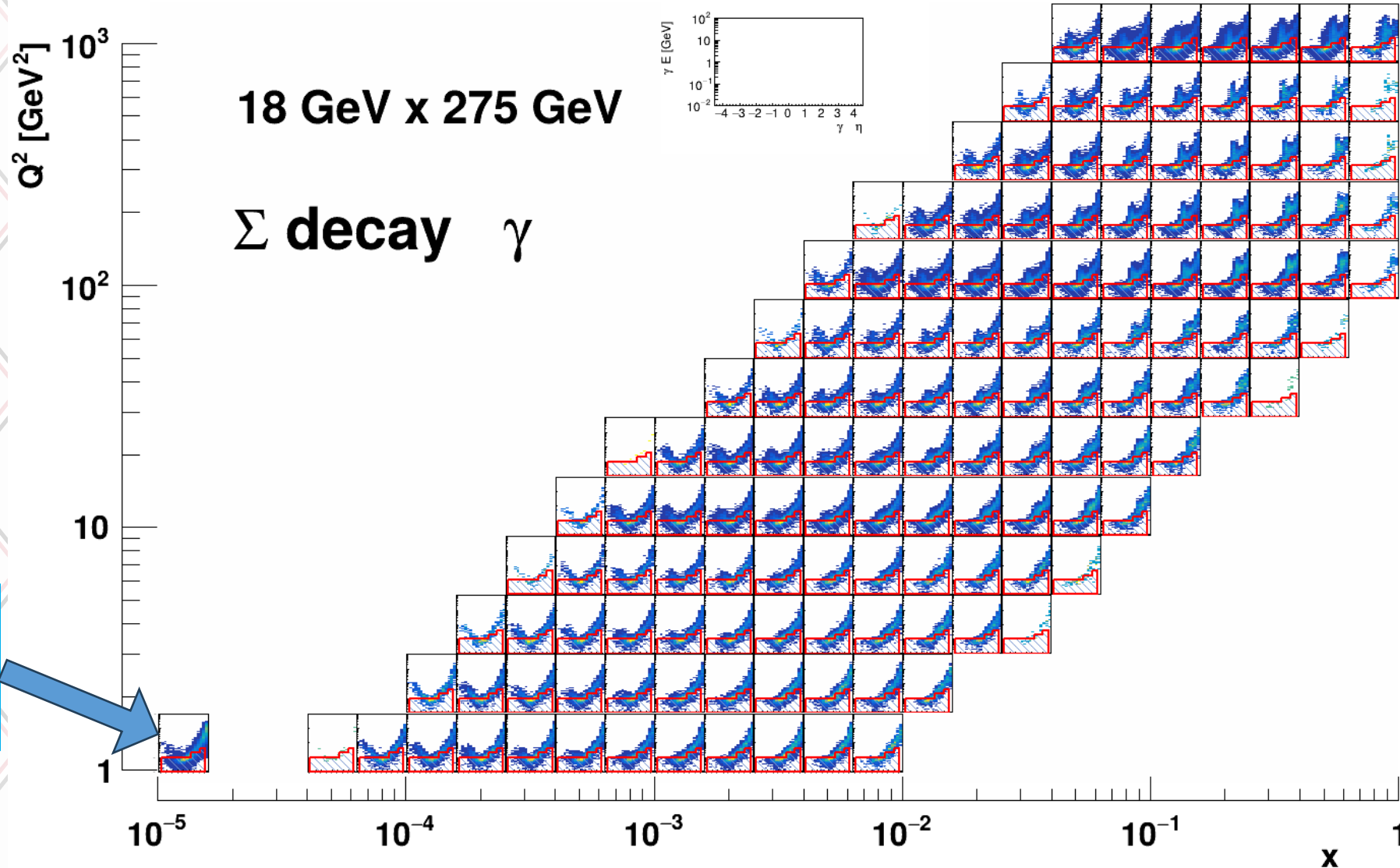
Total loss fraction for photons from Σ^0 vs z



DIS/NC w/DIS cuts

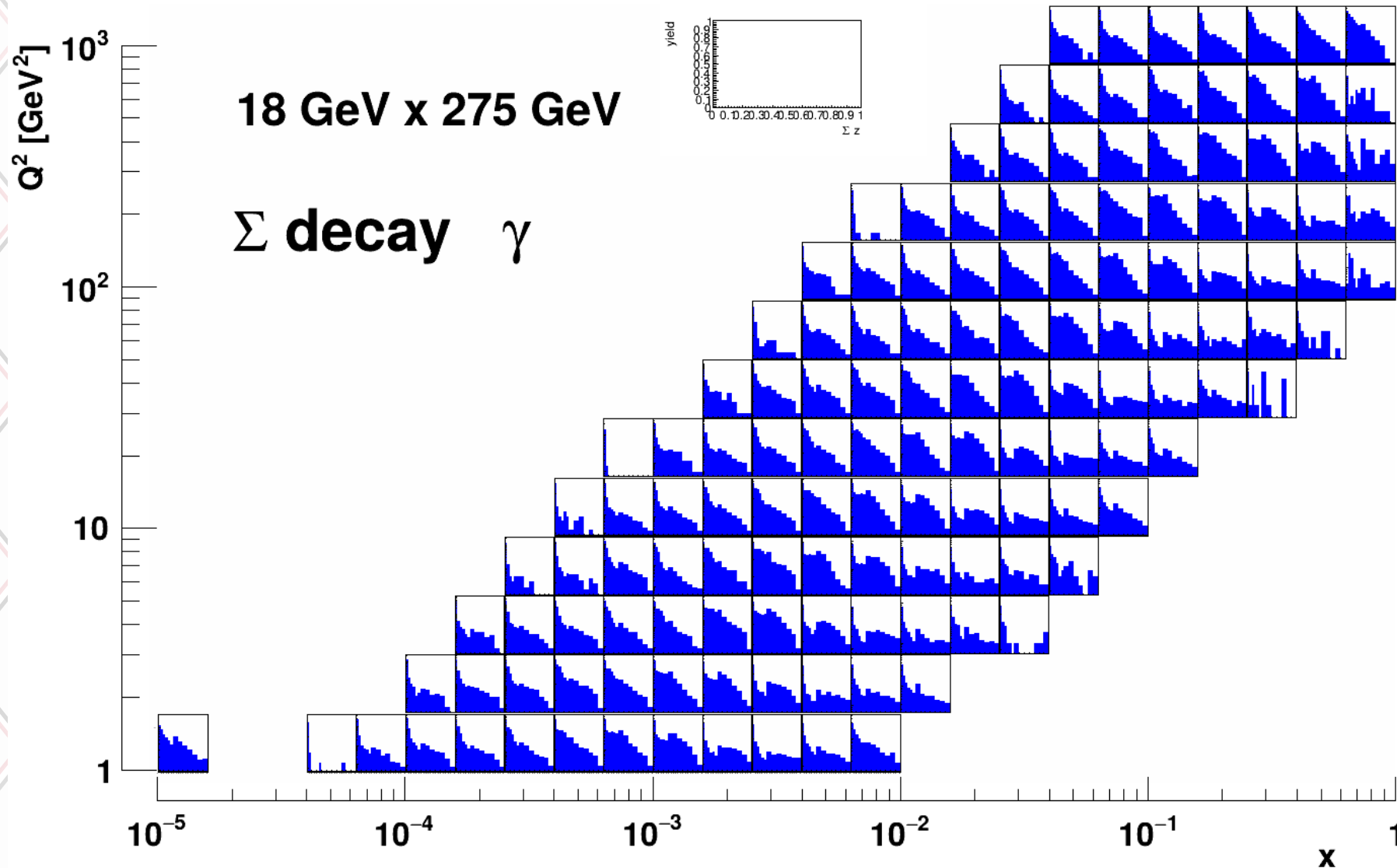
- Surprisingly low-energetic Σ decay photons affect not just the low- z region but also other regions of the z space

DIS Σ^0 events in x/Q^2 binning

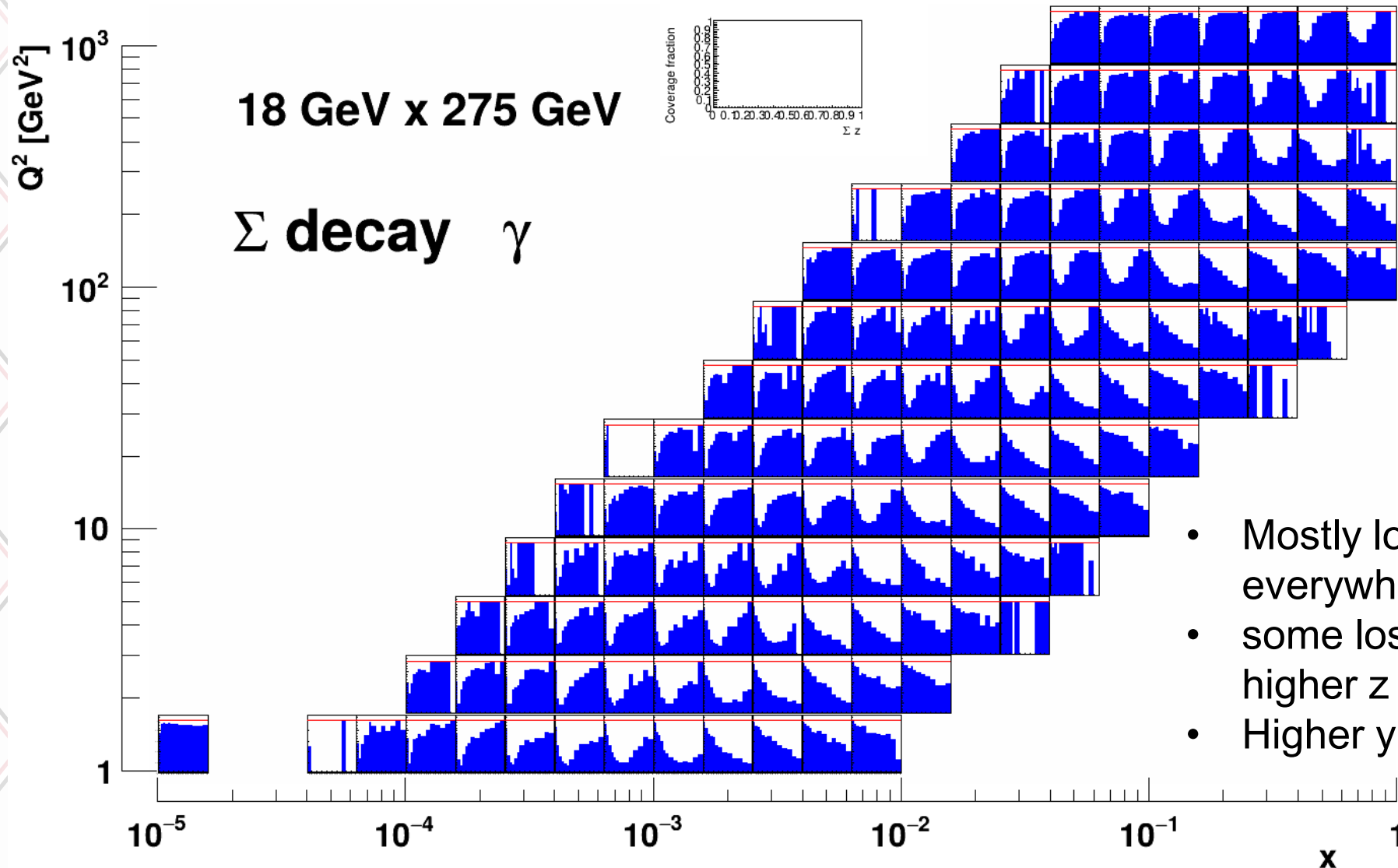


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DIS cuts

Raw DIS Σ^0 yields vs z only in x/Q^2 binning



Raw DIS Σ^0 coverage fraction vs z only in x/Q^2 binning

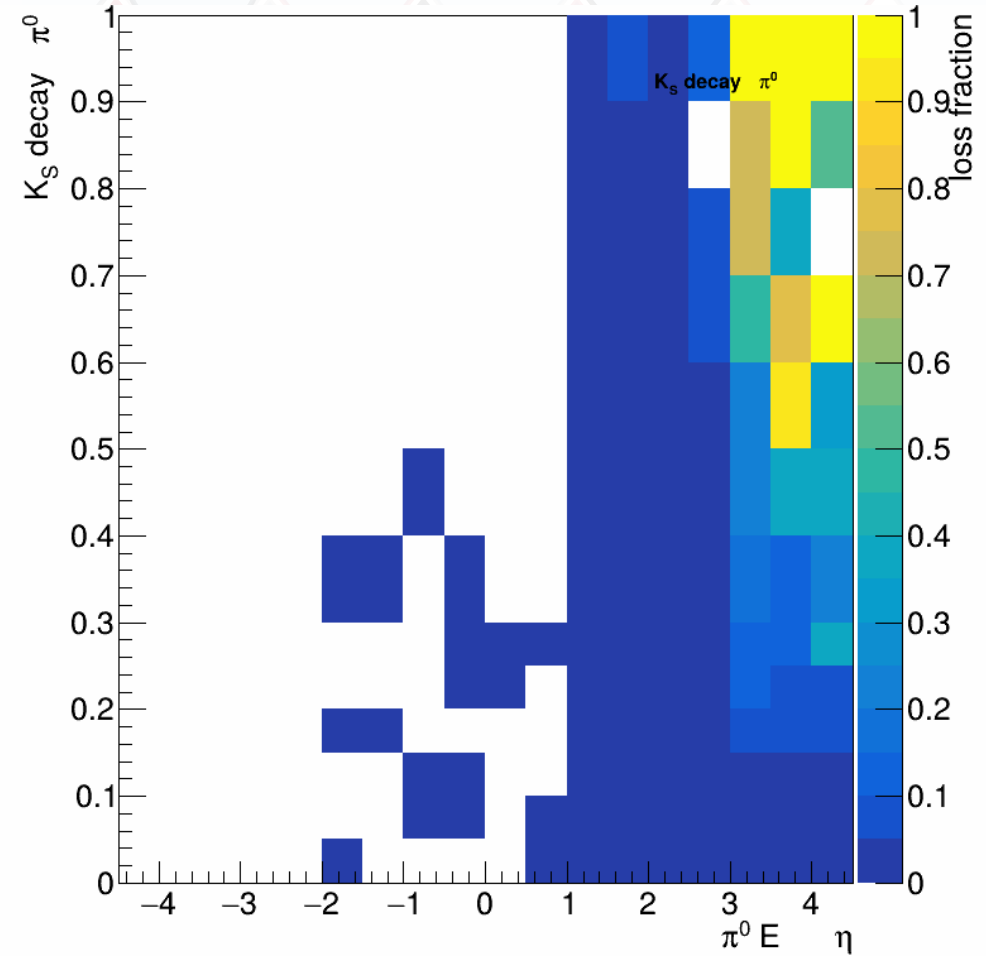
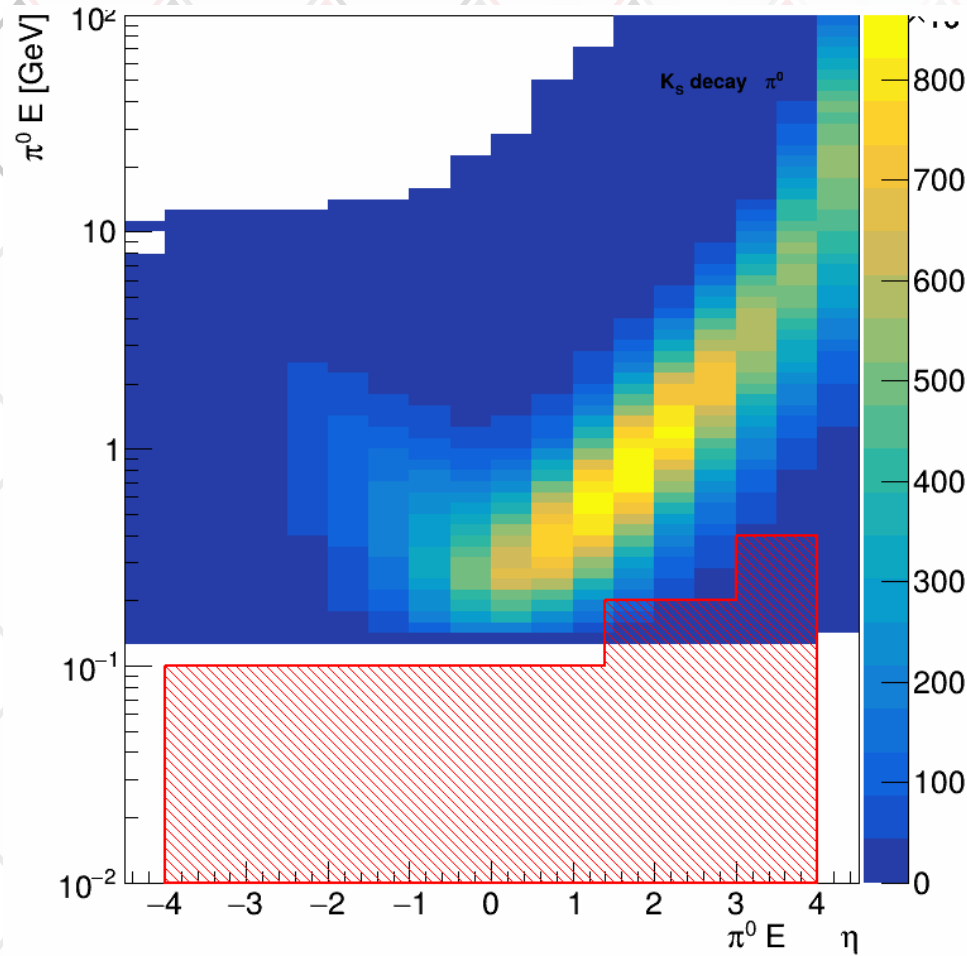


- Mostly losses at low- z everywhere
- some losses at mid-to-higher z for low y
- Higher y generally ok

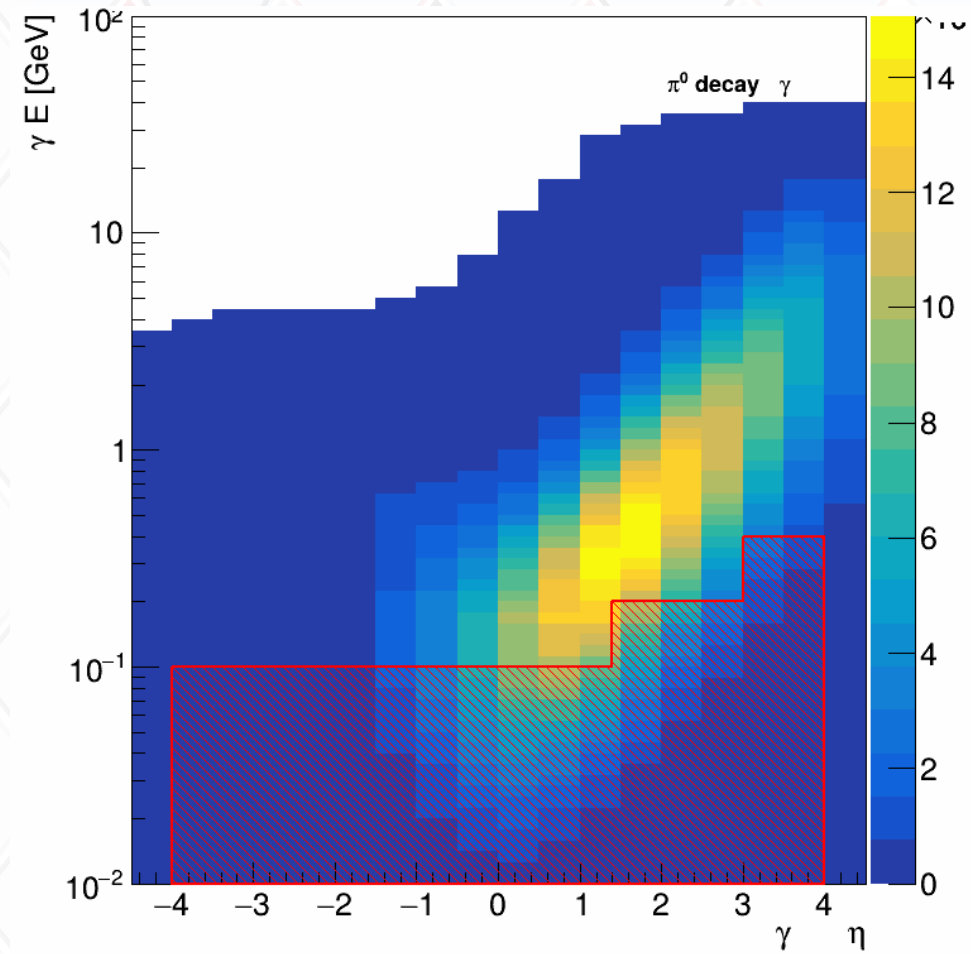
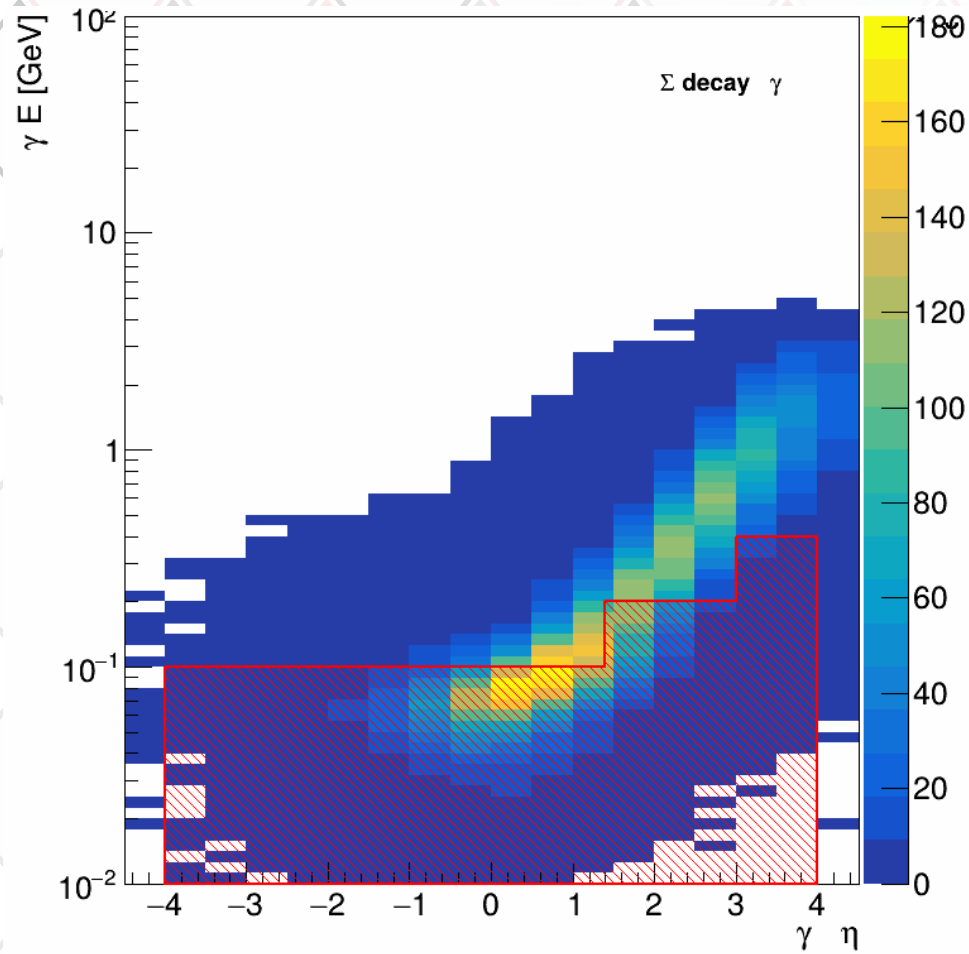
Conclusions

- Not many SIDIS π^0 are affected by minimum Energy capabilities for the EMCals
- Surprisingly many Σ decay photons seem to be lost which may affect separation of prompt from decay Λ (potentially relevant for polarizing FFs), however phase space is still there
- Impact at lower collision energies slightly higher

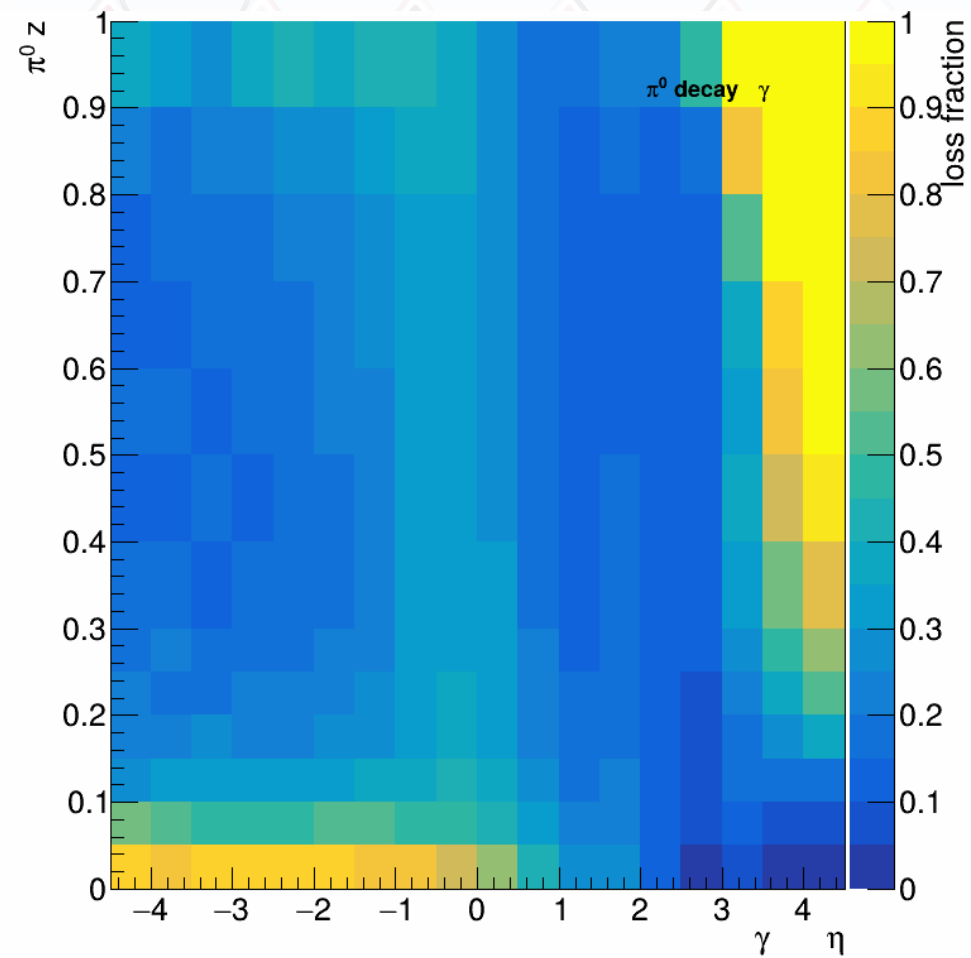
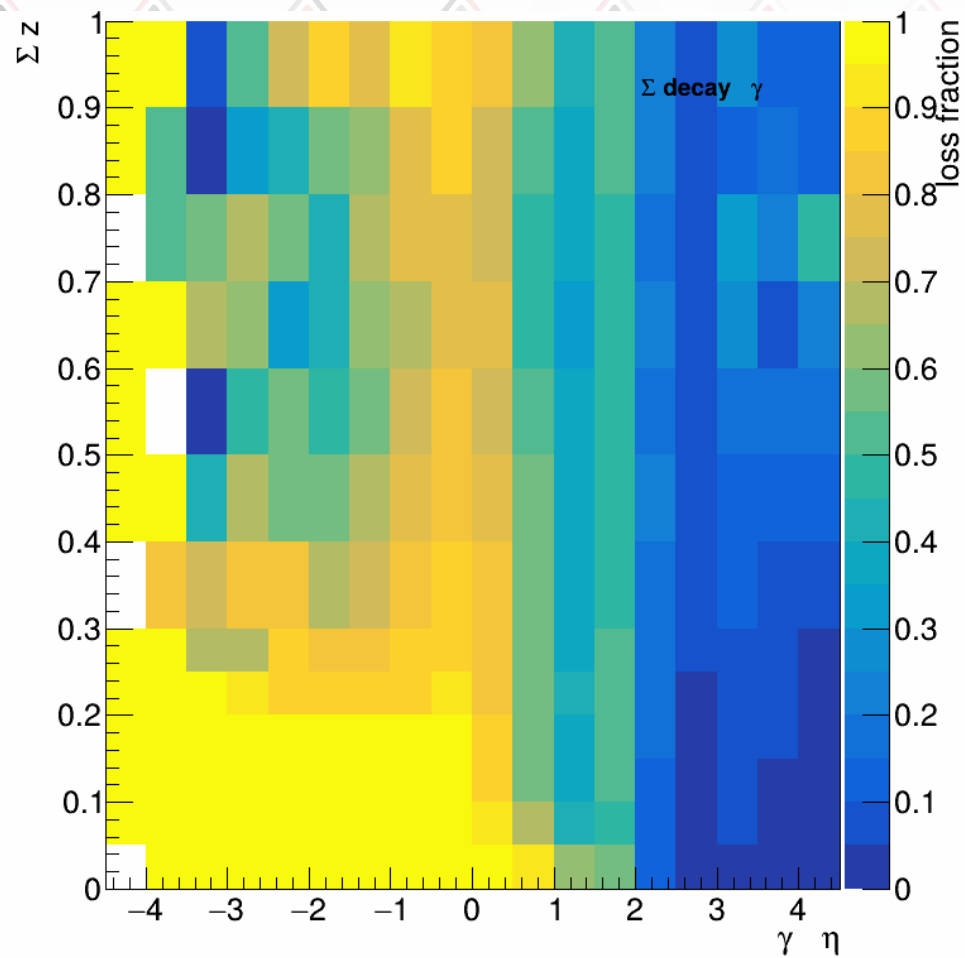
K_S decay π^0 (only looked at π^0 energies, not photons)



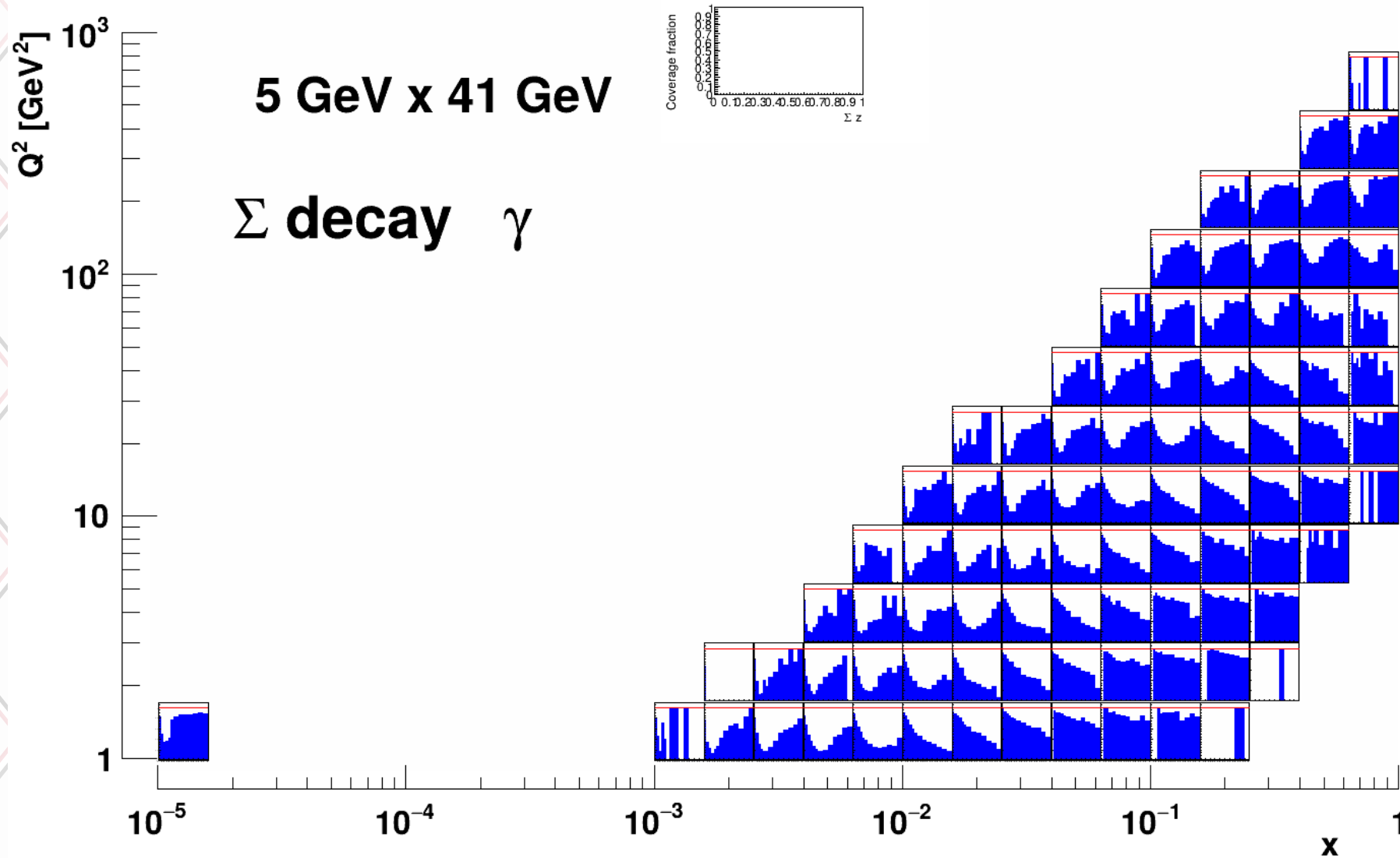
5x41 GeV energies



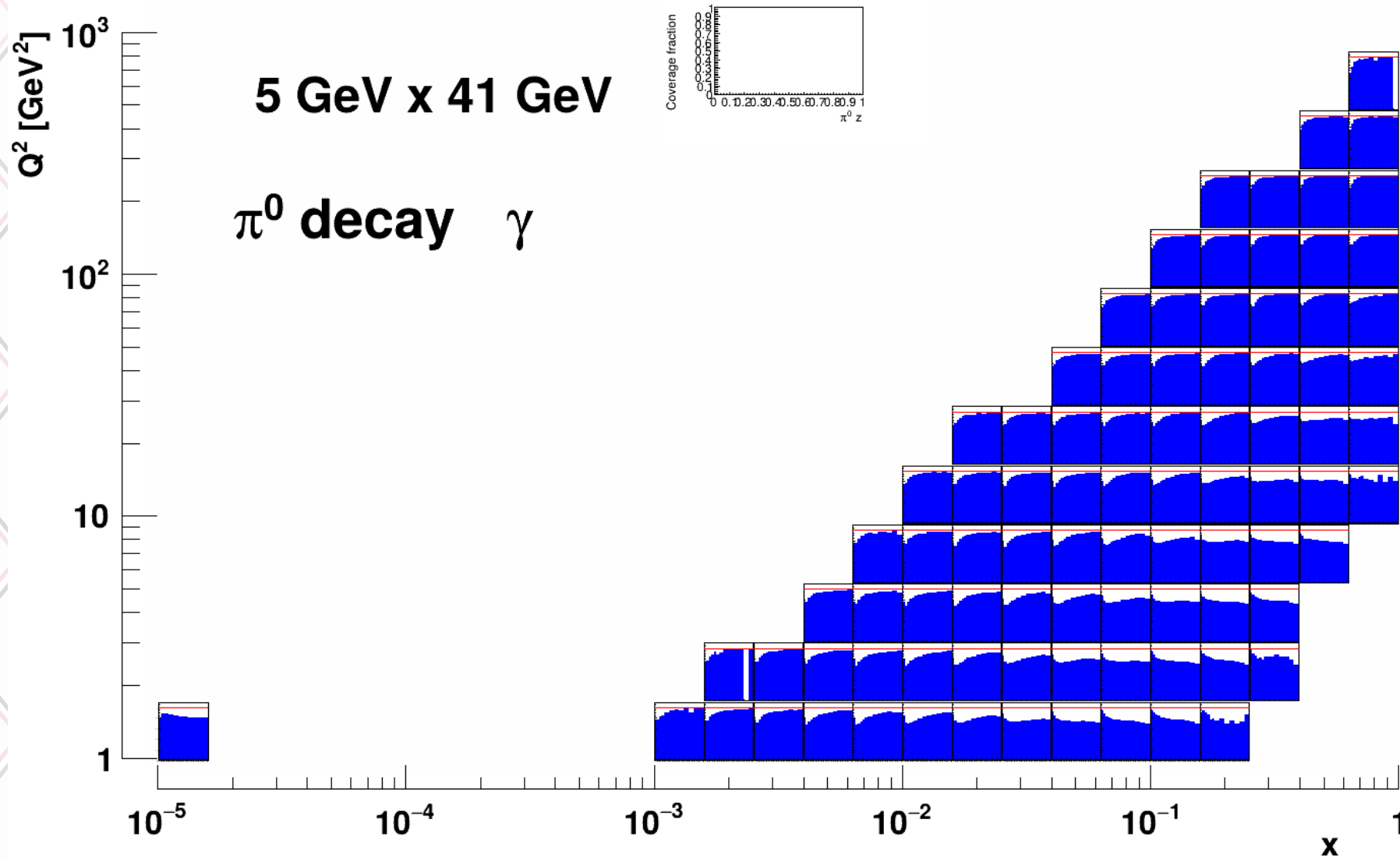
Loss fractions vs z 5x41



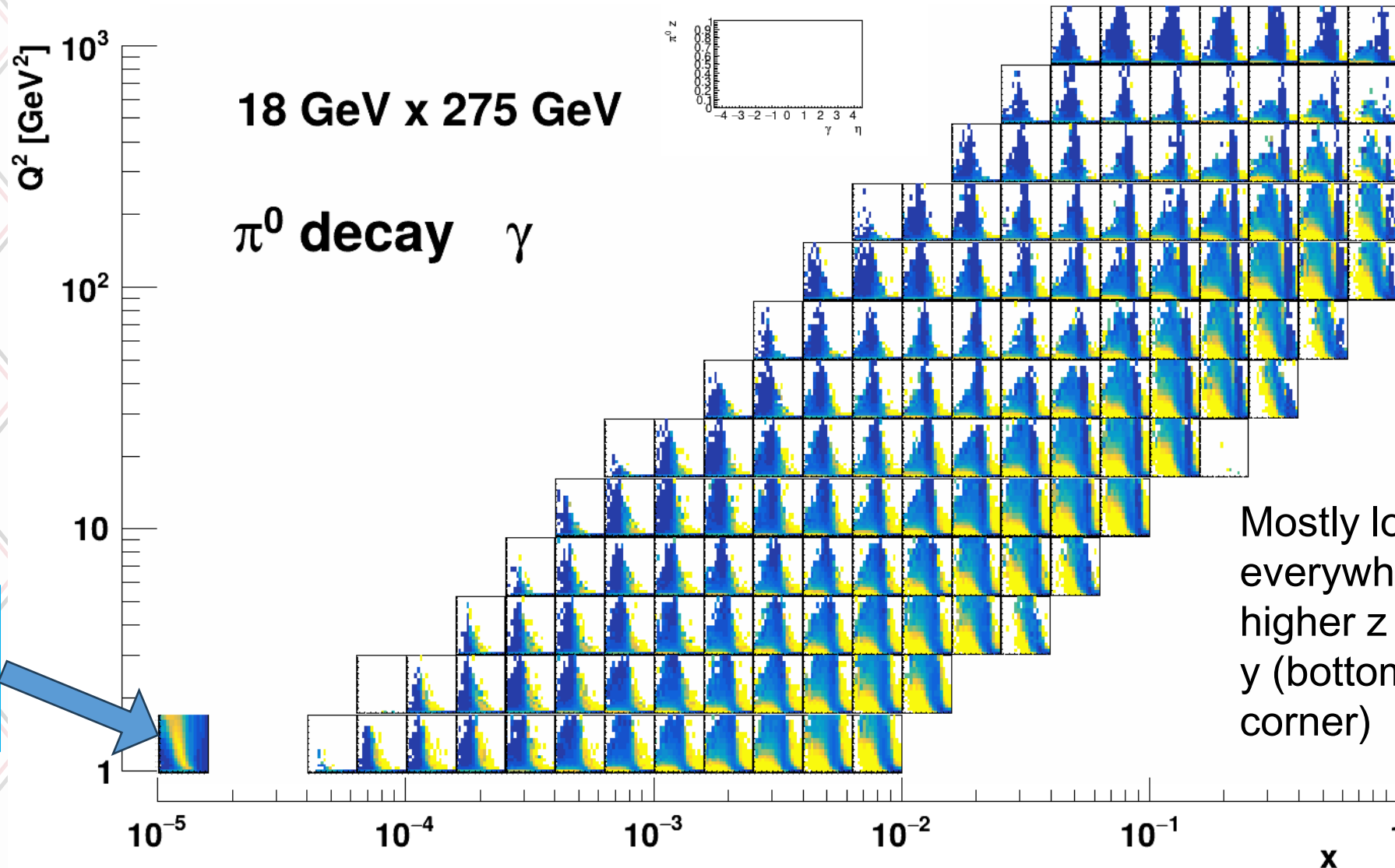
Coverage fraction



Coverage fraction

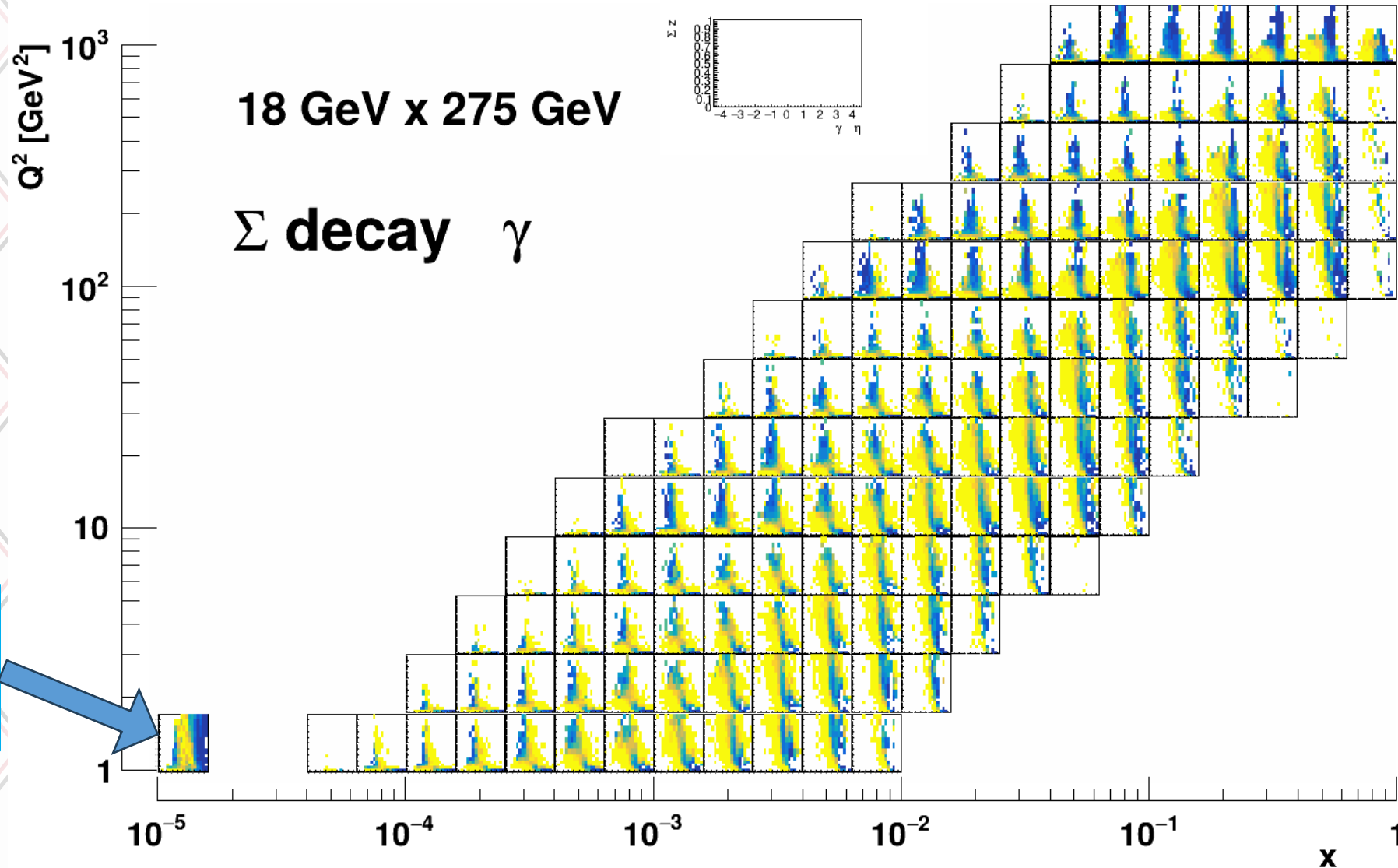


DIS π^0 decay γ loss fractions x/Q^2 binning



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DIS cuts

DIS Σ^0 loss fractions in x/Q^2 binning



Raw DIS Σ^0 events in x/Q^2 binning

