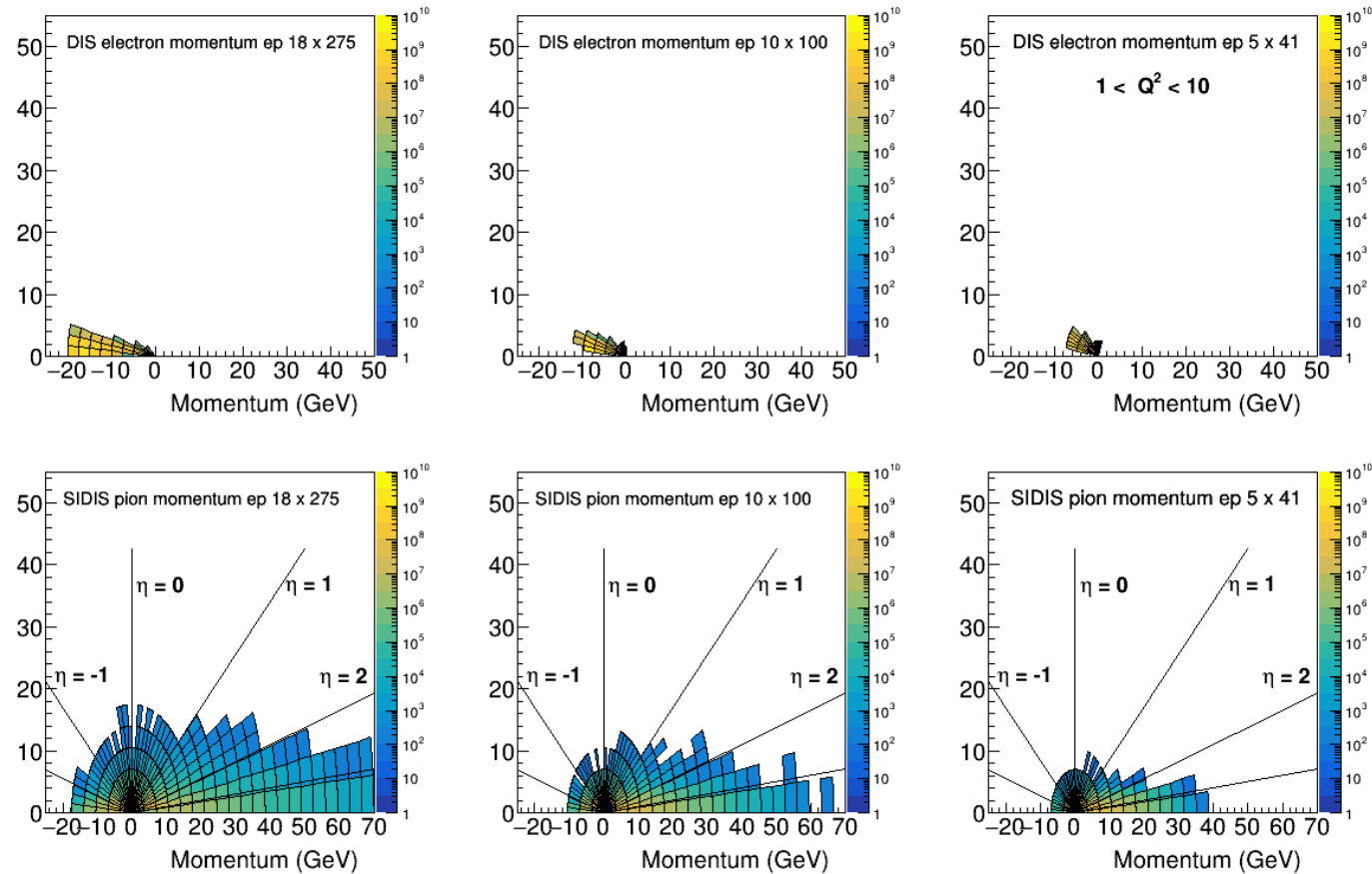


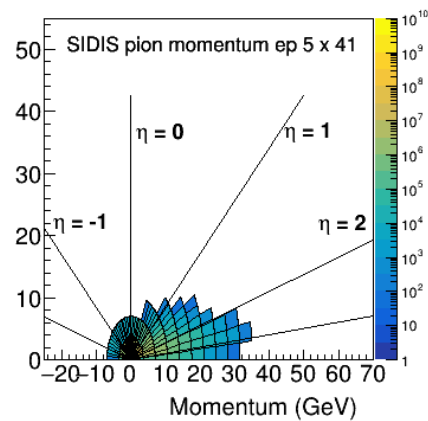
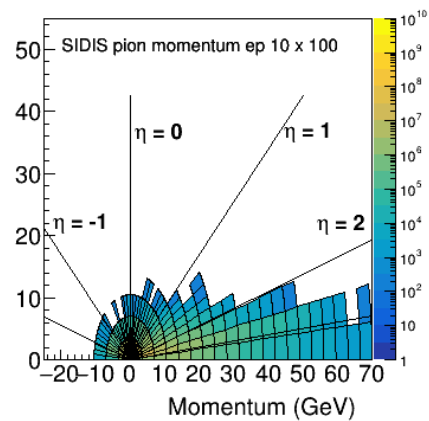
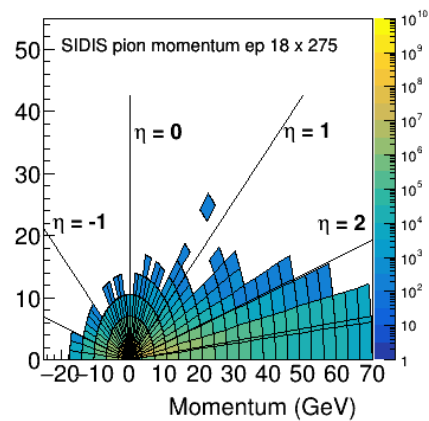
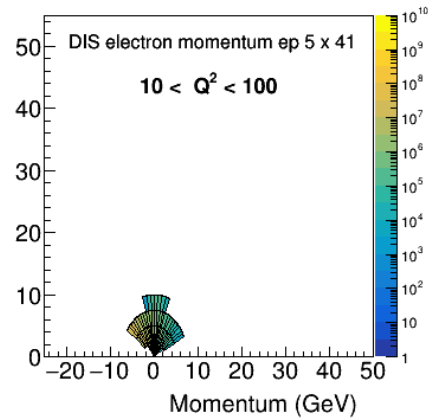
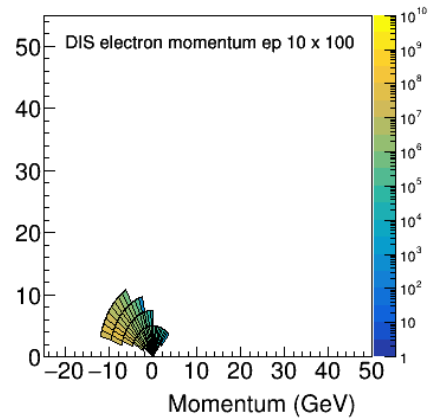
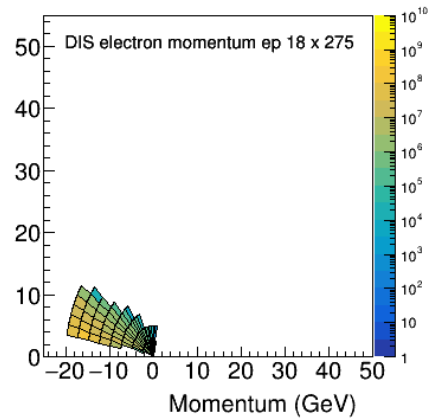
Acceptance studies

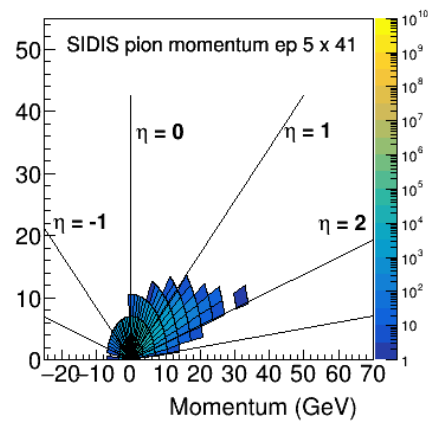
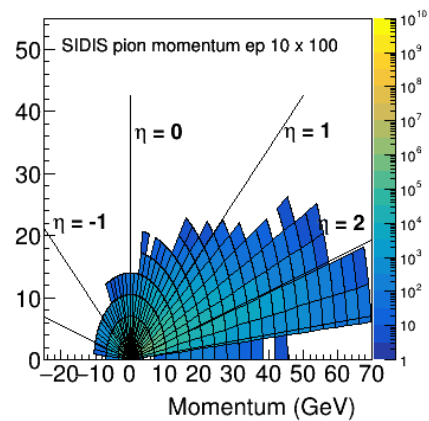
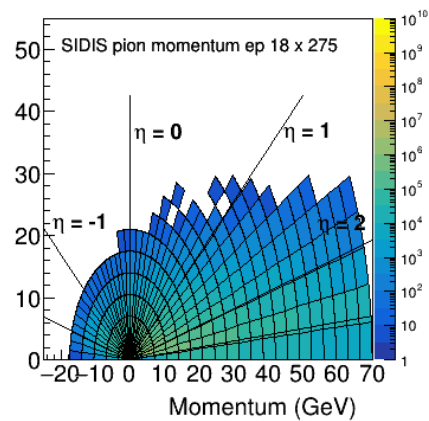
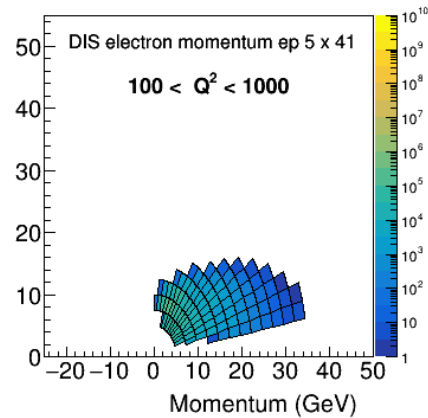
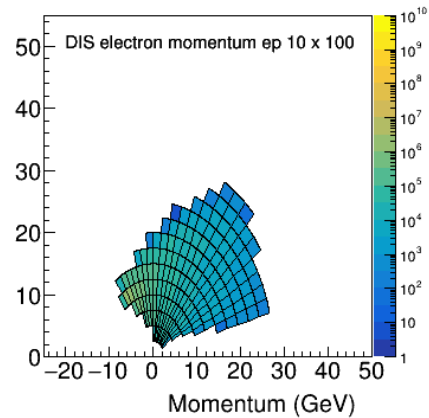
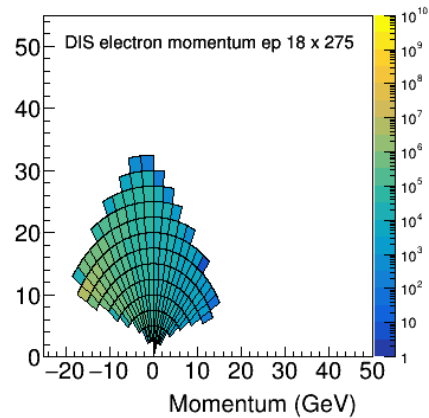
Ralf Seidl (RIKEN)

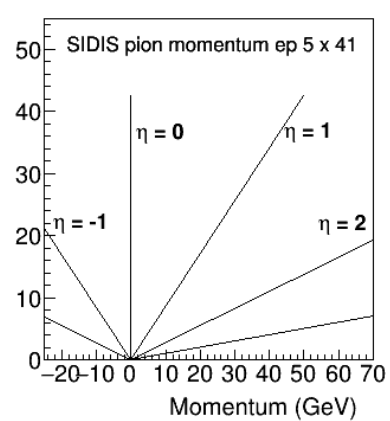
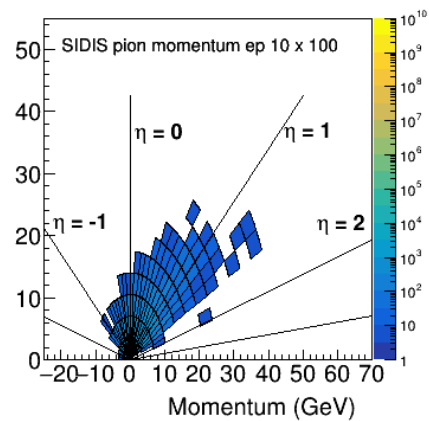
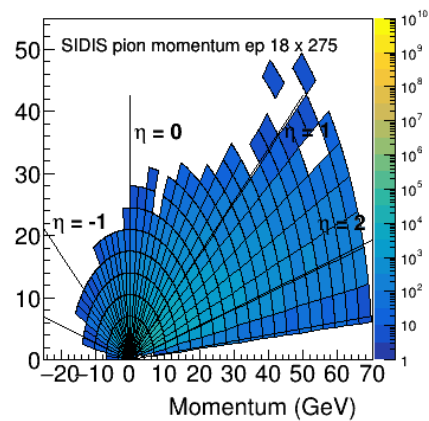
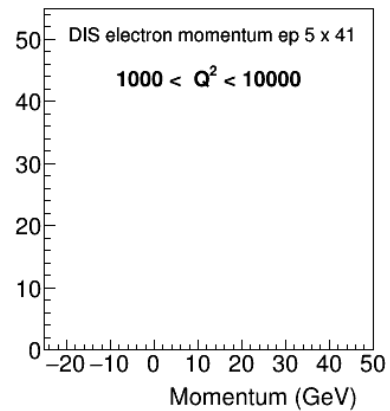
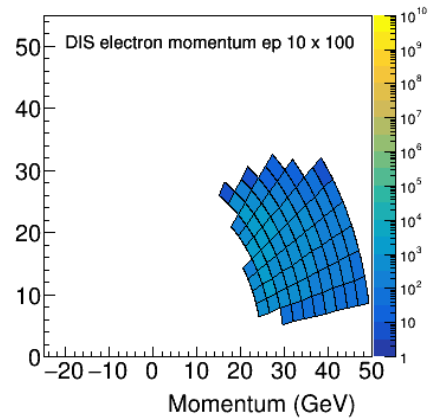
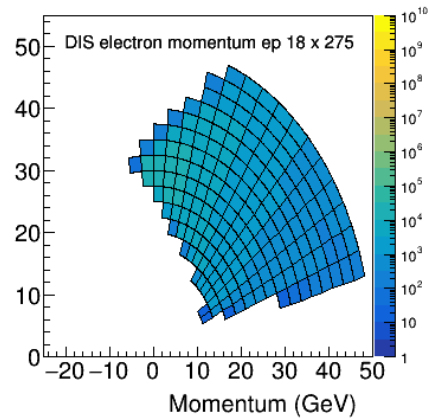
9/24 update

Estimated yields for 10fb^{-1}

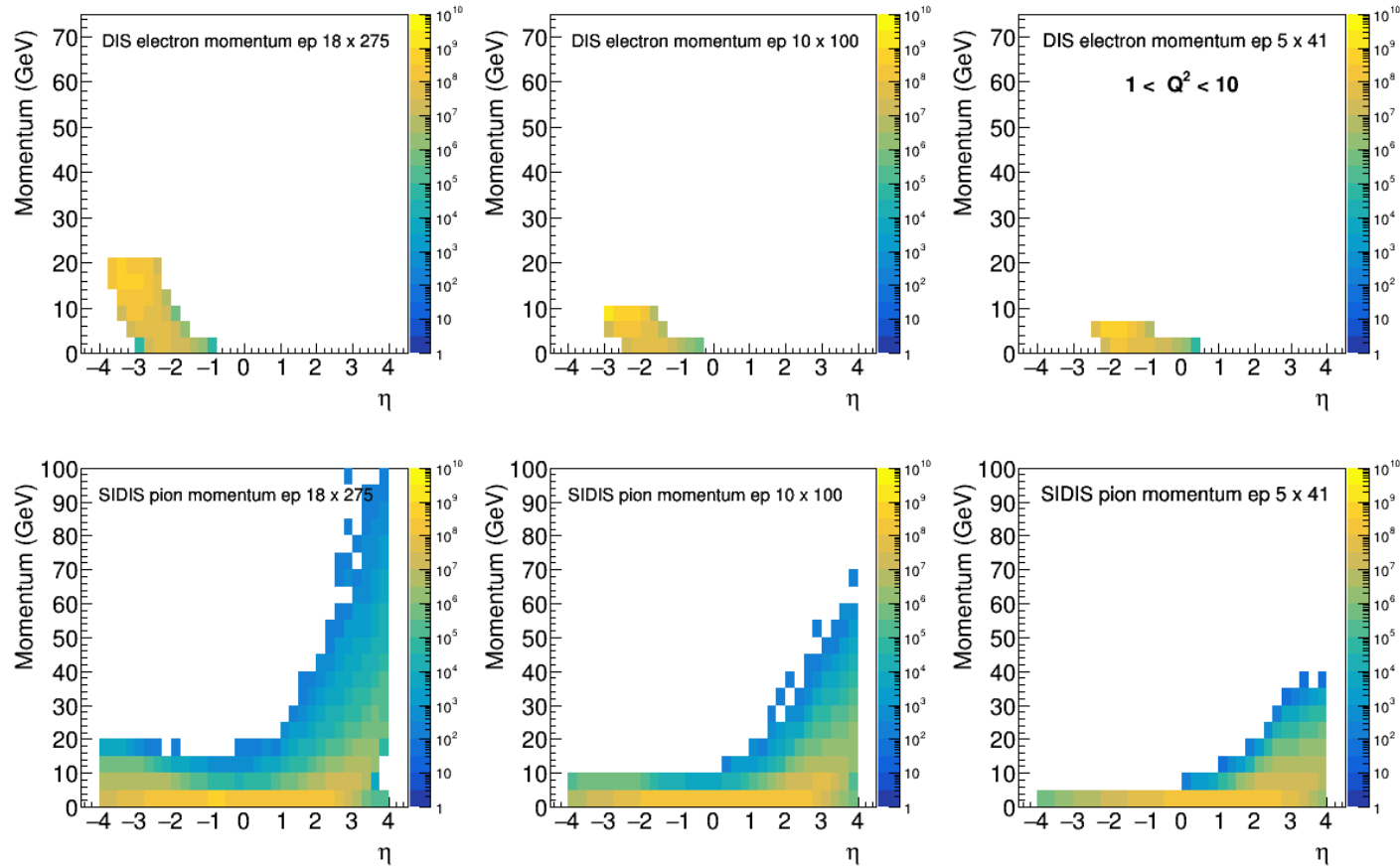


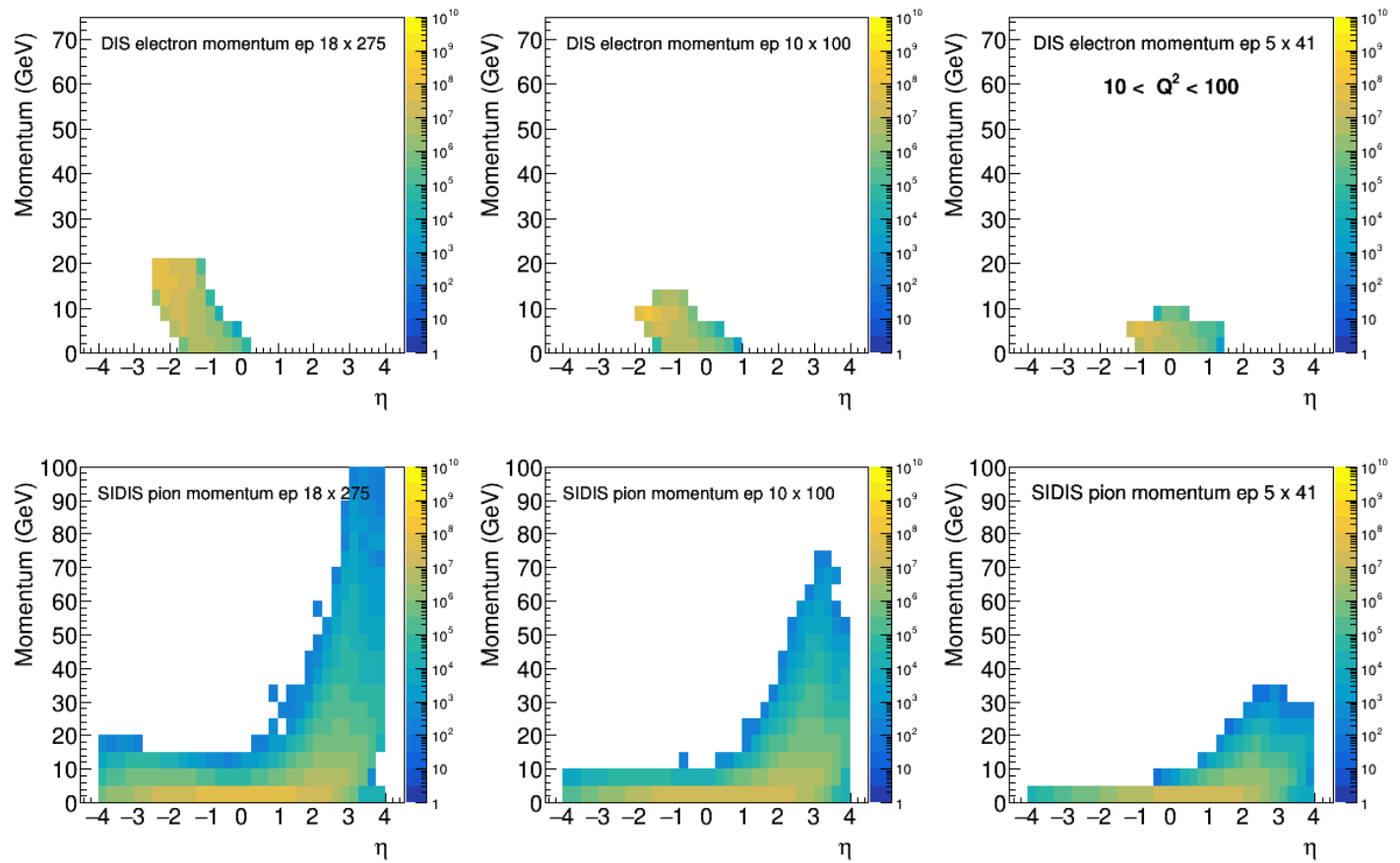


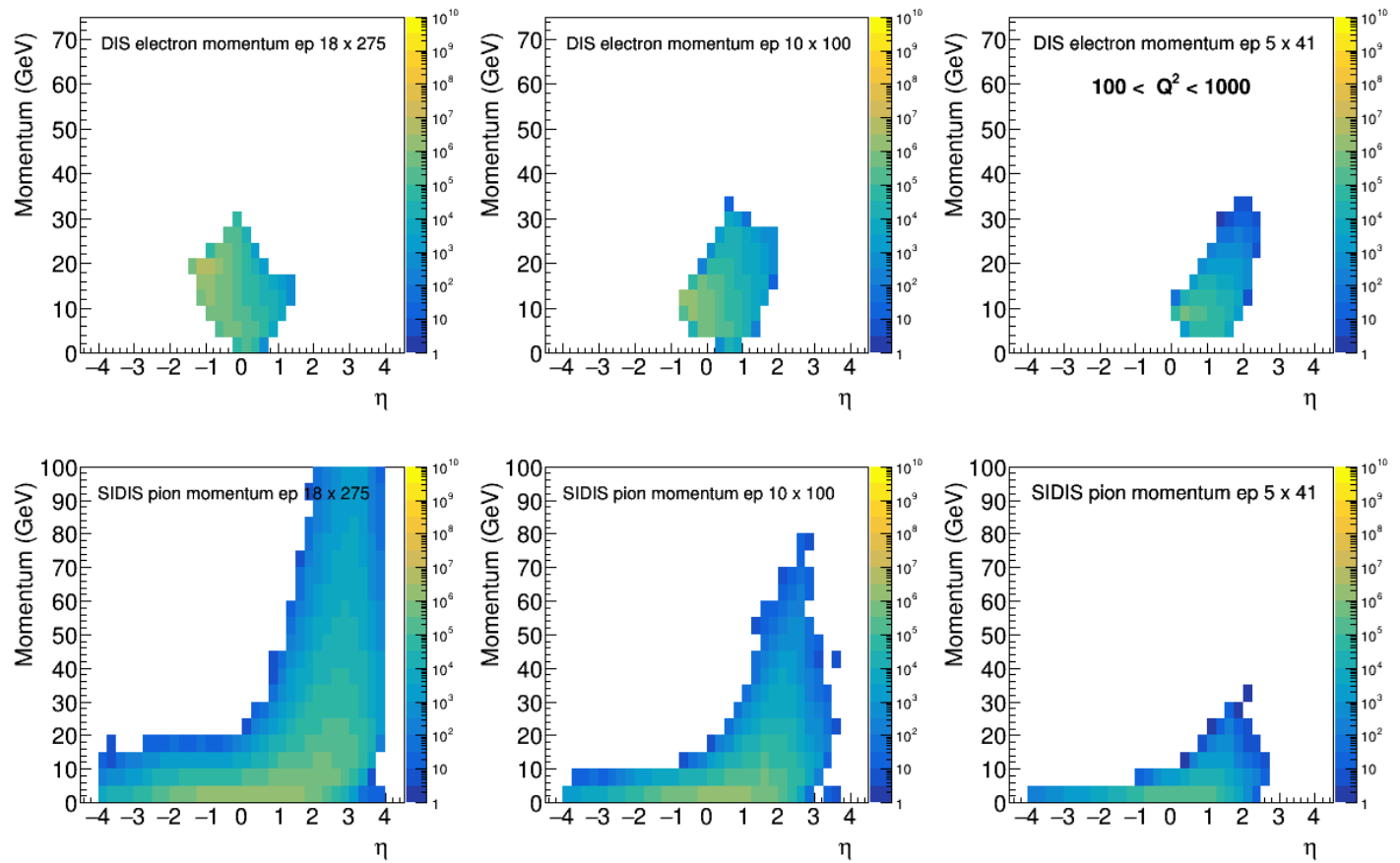


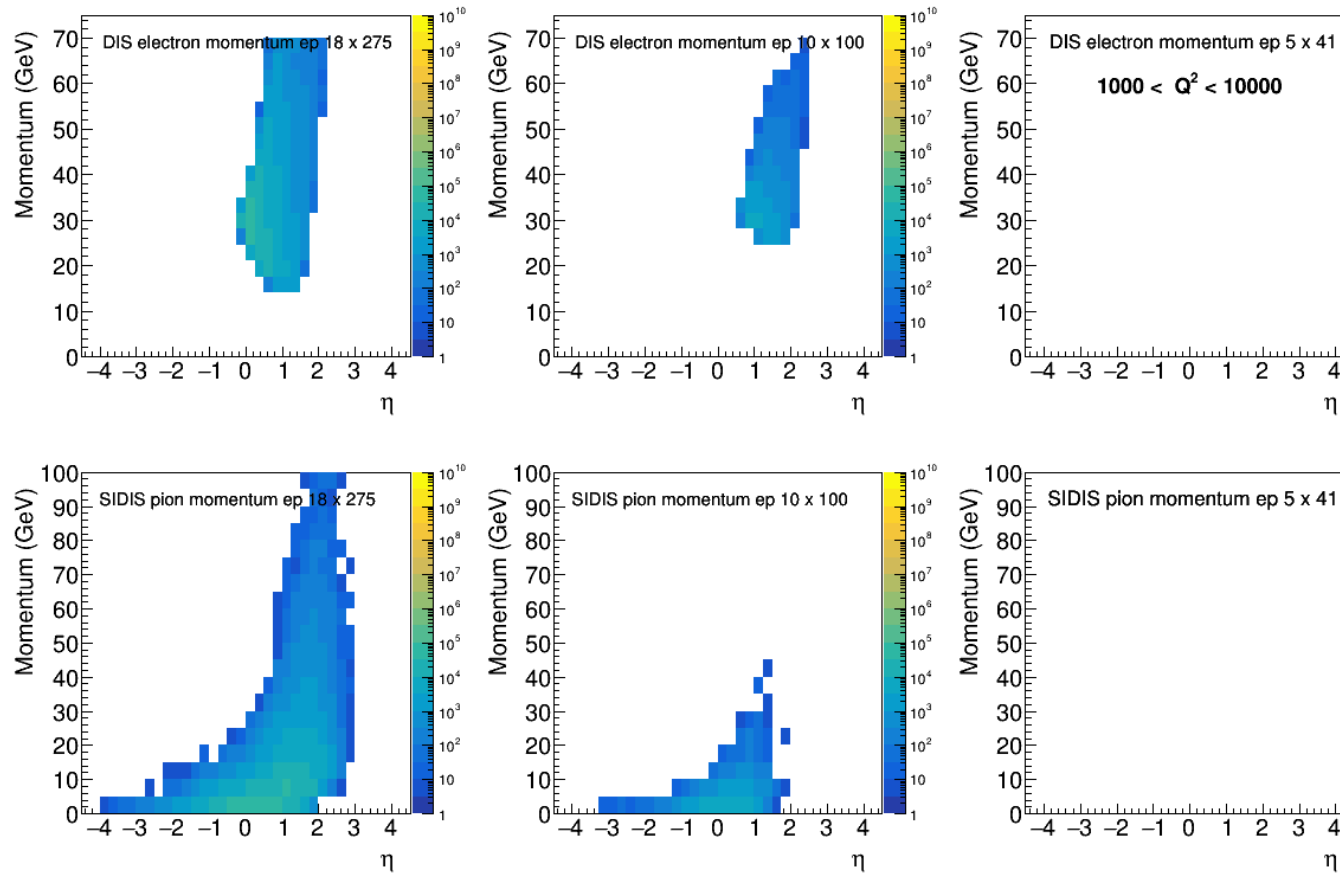


Same, vs rapidity









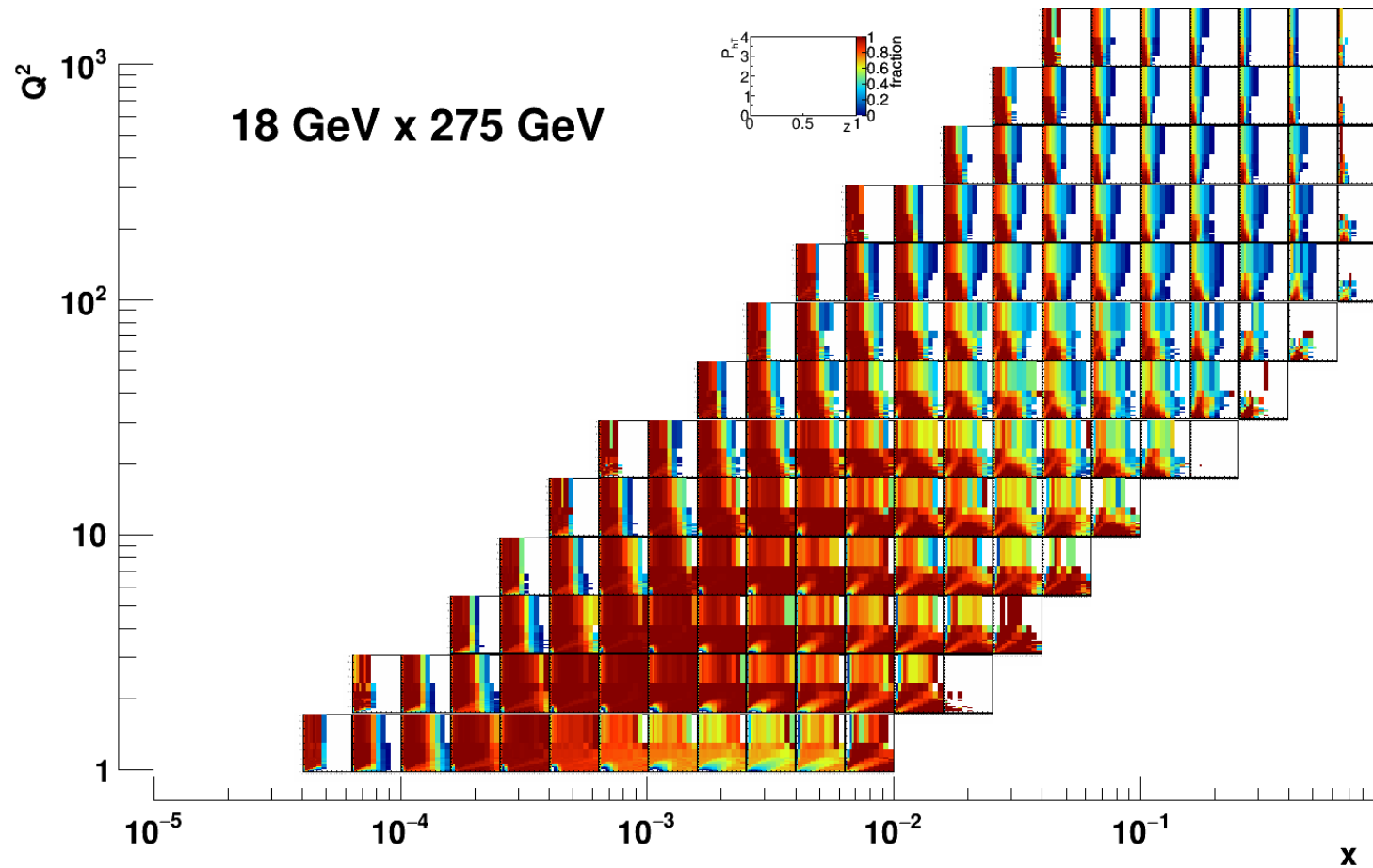
Different PID ranges tested for 4D acceptance

Matrix 1	$\pi/K/p$	SIDIS 2	$\pi/K/p$	Pi0 highp 4	π/K	p	SIDIS request 5	$\pi/K/p$
-3.5 - -1.0	0.2 - 7	-3.5 - -1.0	0.2 - 7	-3.5 - -1.0	0.2 - 5	0.2 - 8	-3.5 - -1.0	0.2 - 7
-1.0 - 1.0	0.2 - 5	-1.0 - 1.0	0.2 - 8	-1.0 - 1.0	0.2 - 4	0.2 - 4	-1.0 - 1.0	0.2 - 8
1.0 - 2.0	0.2 - 8	1.0 - 2.0	0.2 - 10	1.0 - 2.0	0.2 - 100	0.2 - 100	1.0 - 2.0	0.2 - 20
2.0 - 3.0	0.5 - 20	2.0 - 3.0	0.5 - 20	2.0 - 3.0	0.5 - 100	3.0 - 100	2.0 - 3.0	0.5 - 30
3.0 - 3.5	0.5 - 45	3.0 - 3.5	0.5 - 45	3.0 - 3.5	0.5 - 100	3.0 - 100	3.0 - 3.5	0.5 - 45

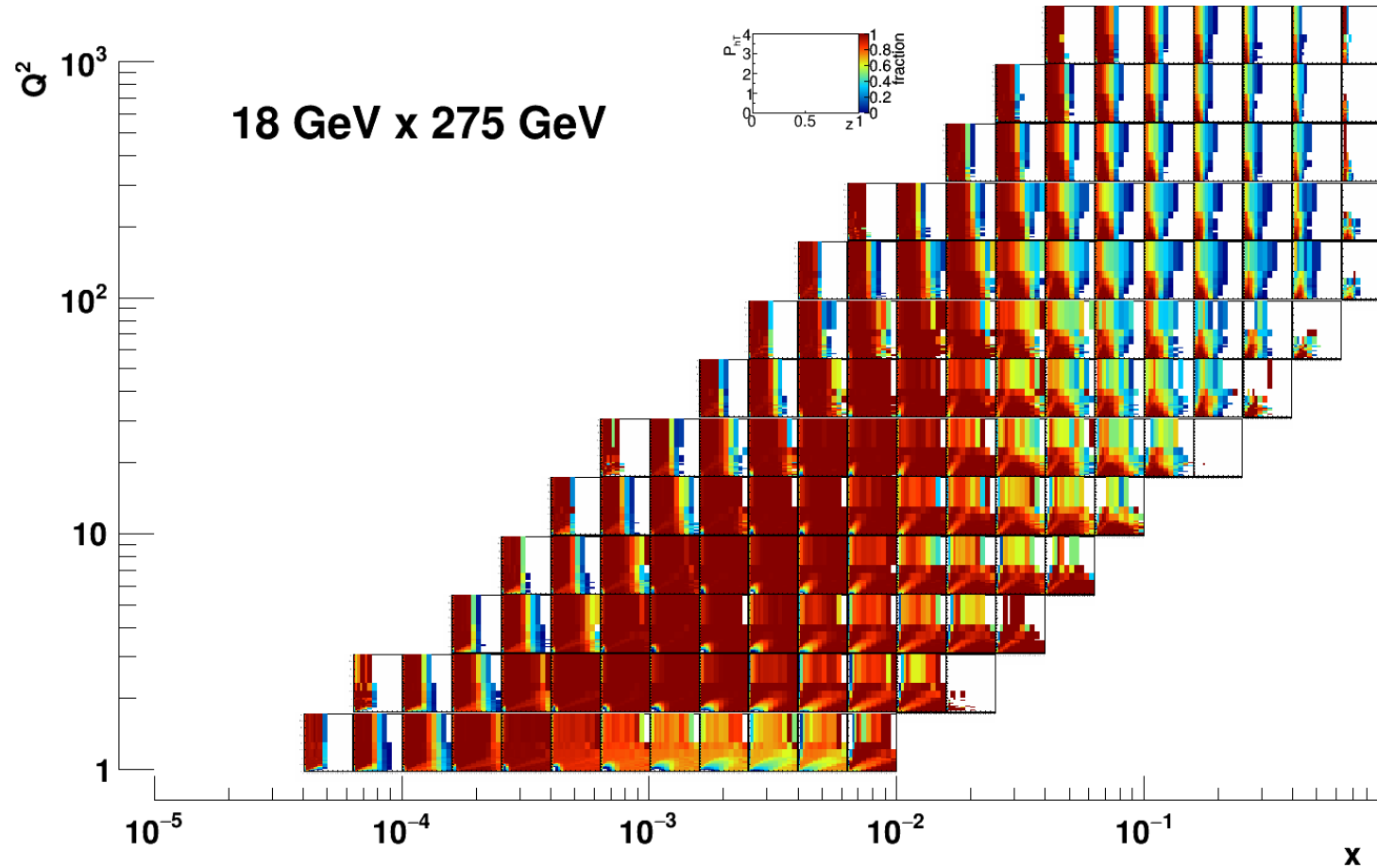
Old 3	π/K	p	High pt 6	$\pi/K/p$	Low pt: 7	$\pi/K/p$
-3.5 - -1.0	0.2 - 5	0.2 - 8	-3.5 - -1.0	0.2 - 7	-3.5 - -1.0	1.5 - 7
-1.0 - 1.0	0.2 - 4	0.2 - 4	-1.0 - 1.0	0.2 - 10	-1.0 - 1.0	1.5 - 10
1.0 - 2.0	0.2 - 50	0.2 - 50	1.0 - 2.0	0.2 - 40	1.0 - 2.0	1.5 - 40
2.0 - 3.0	0.5 - 50	3.0 - 50	2.0 - 3.0	0.5 - 45	2.0 - 3.0	1.5 - 45
3.0 - 3.5	0.5 - 50	3.0 - 50	3.0 - 3.5	0.5 - 50	3.0 - 3.5	1.5 - 50

- Compare max momentum requirements for
 - Old (used by Charlotte et al for SIDIS PDF/FF paper)
 - Official Detector Matrix (by DWG/conveners)
 - SIDIS group preference for central detectors
 - Pi0 high p (2-3.5 Old 50 \rightarrow 100 GeV)
 - Official SIDIS group request
- Color coding (yellow higher than Matrix, red lower)

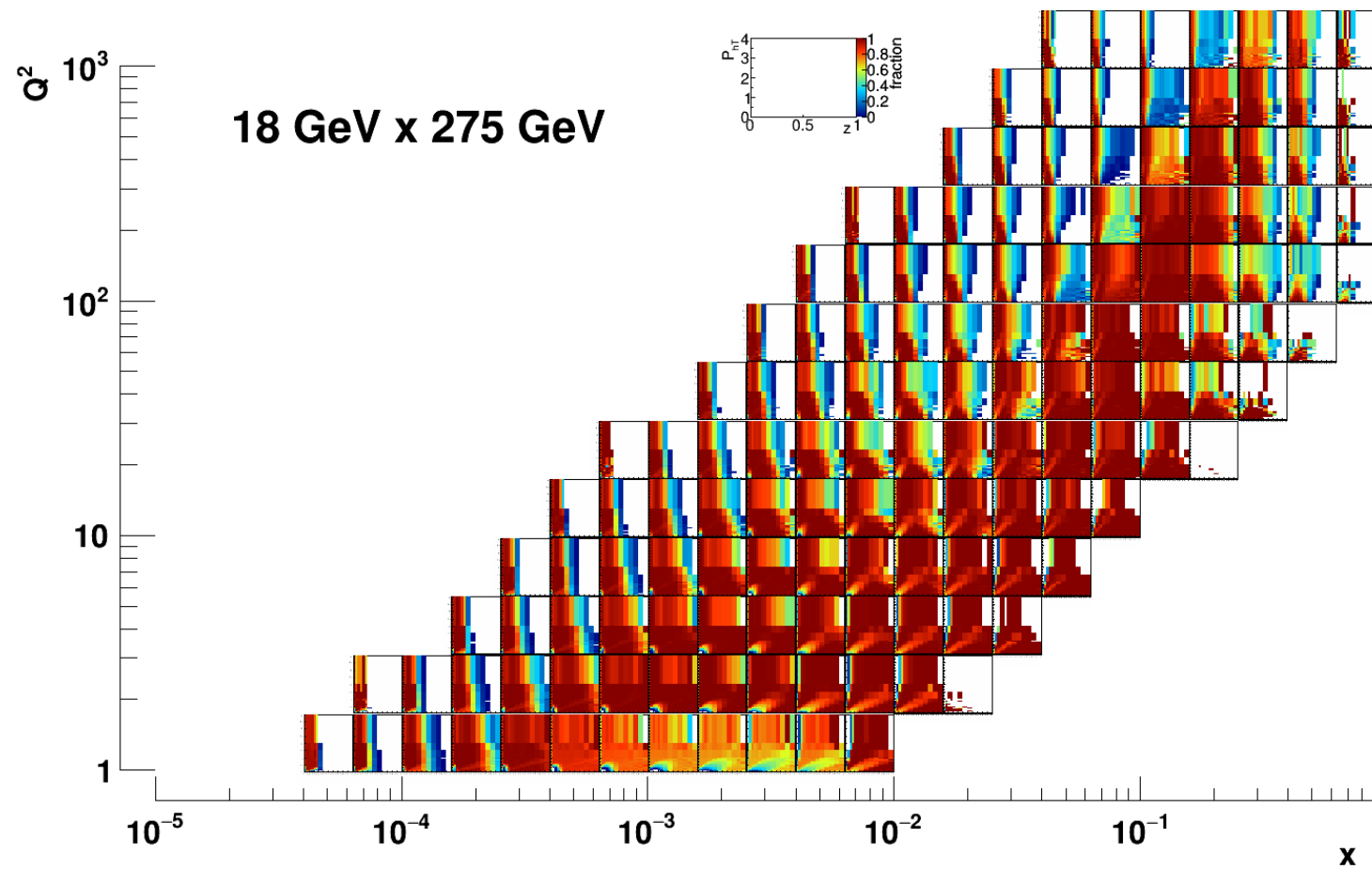
4D ratios (PID acc/perfect): Matrix



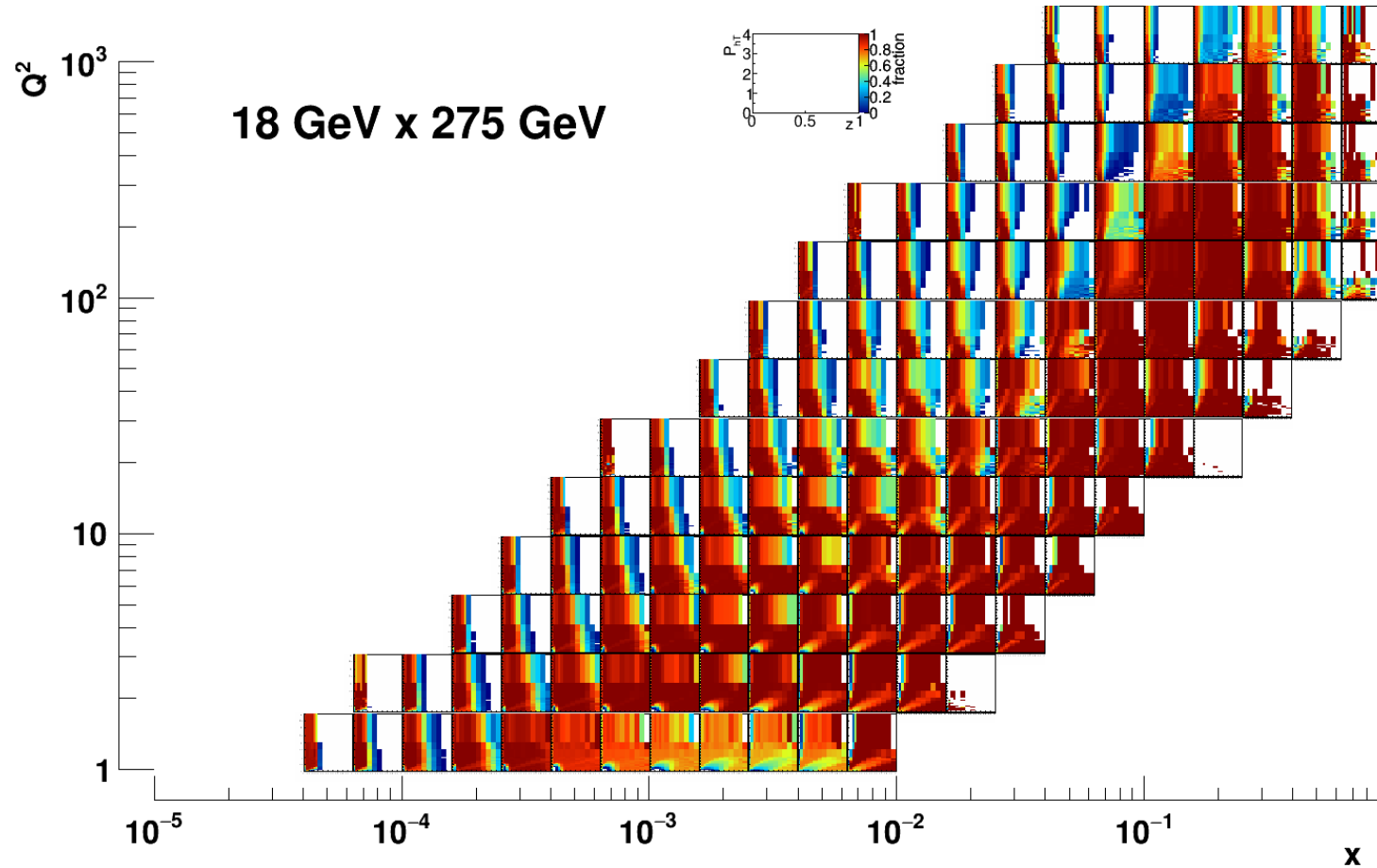
4D ratios (PID acc/perfect): SIDIS



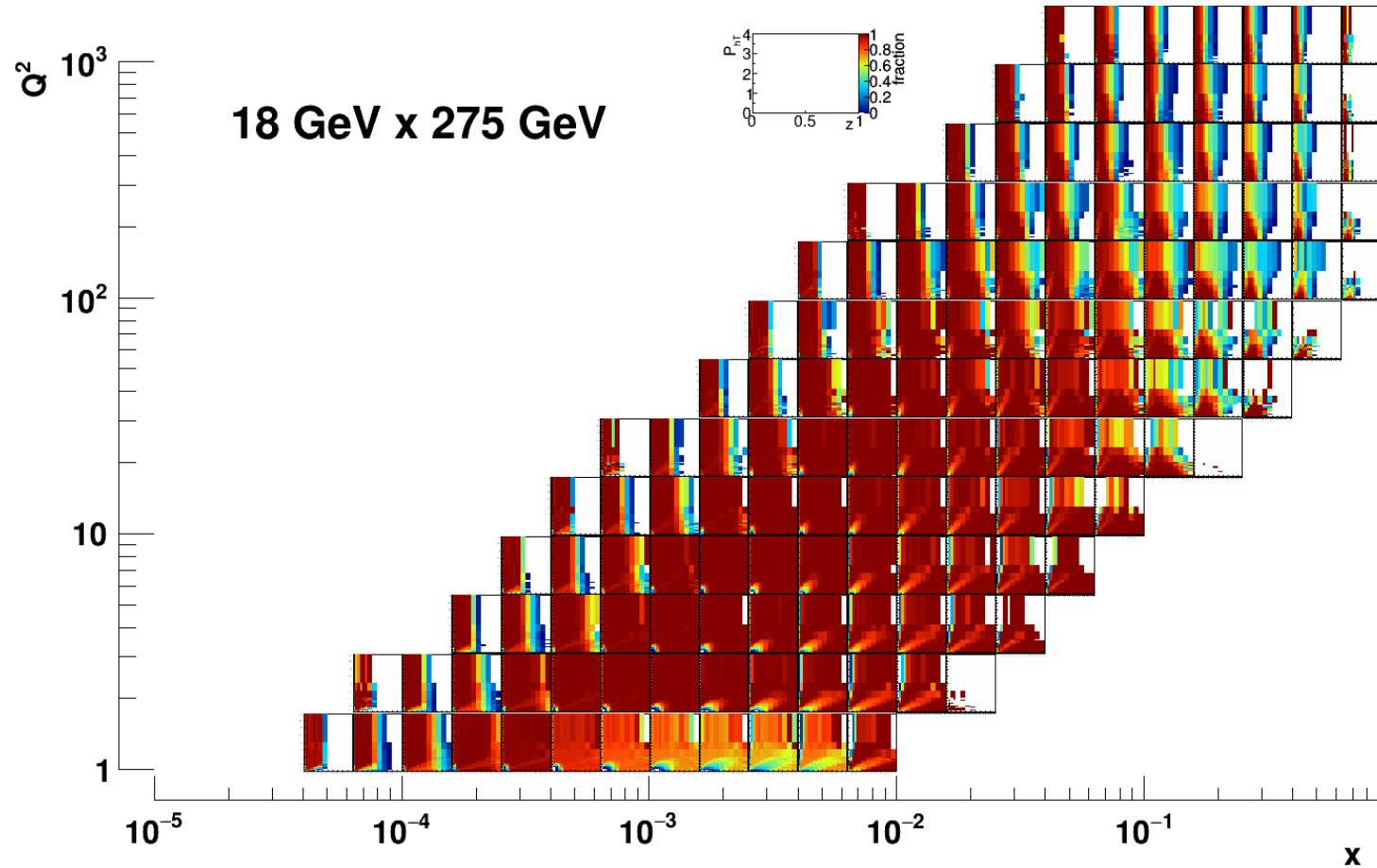
Old



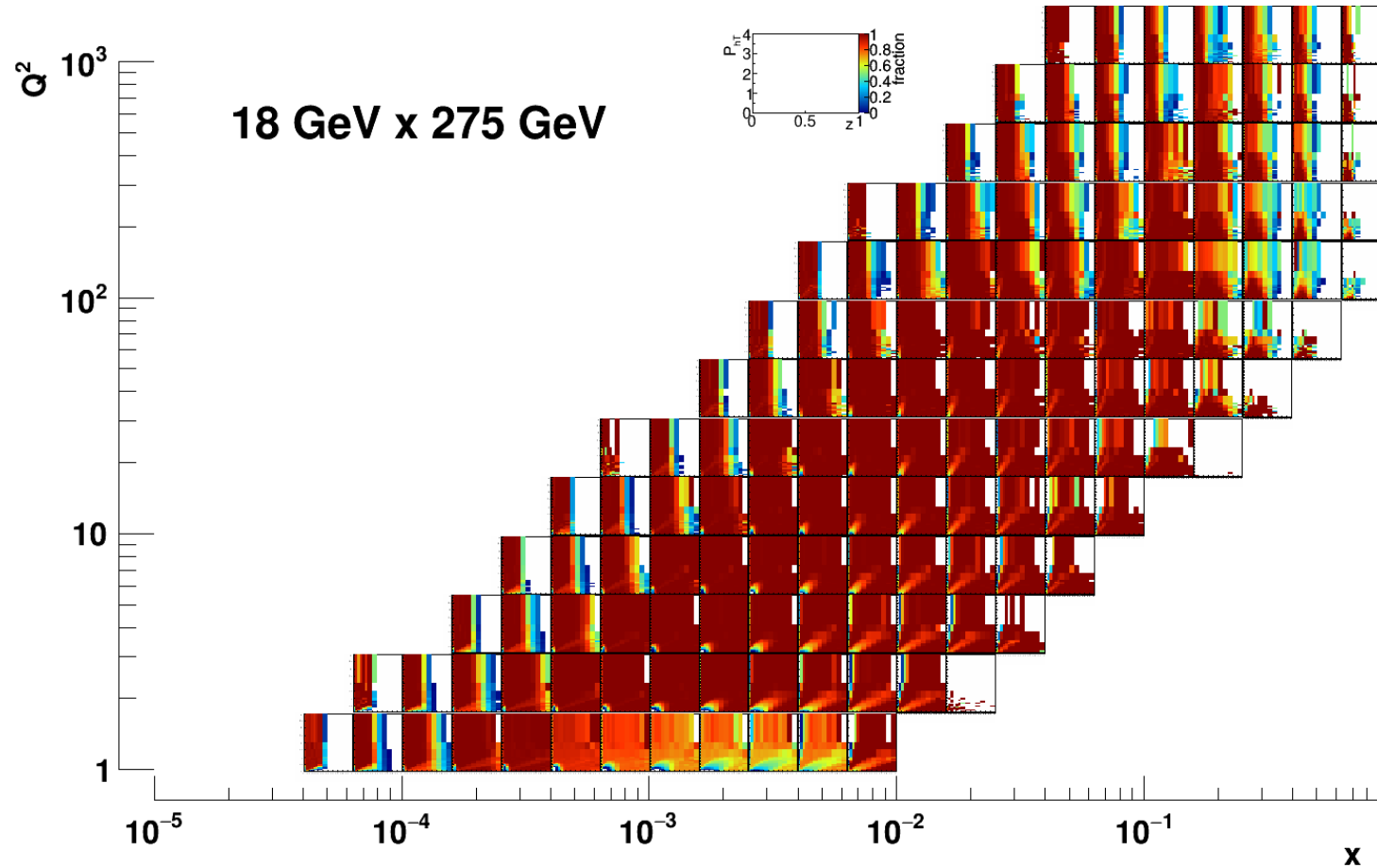
Very high forward P



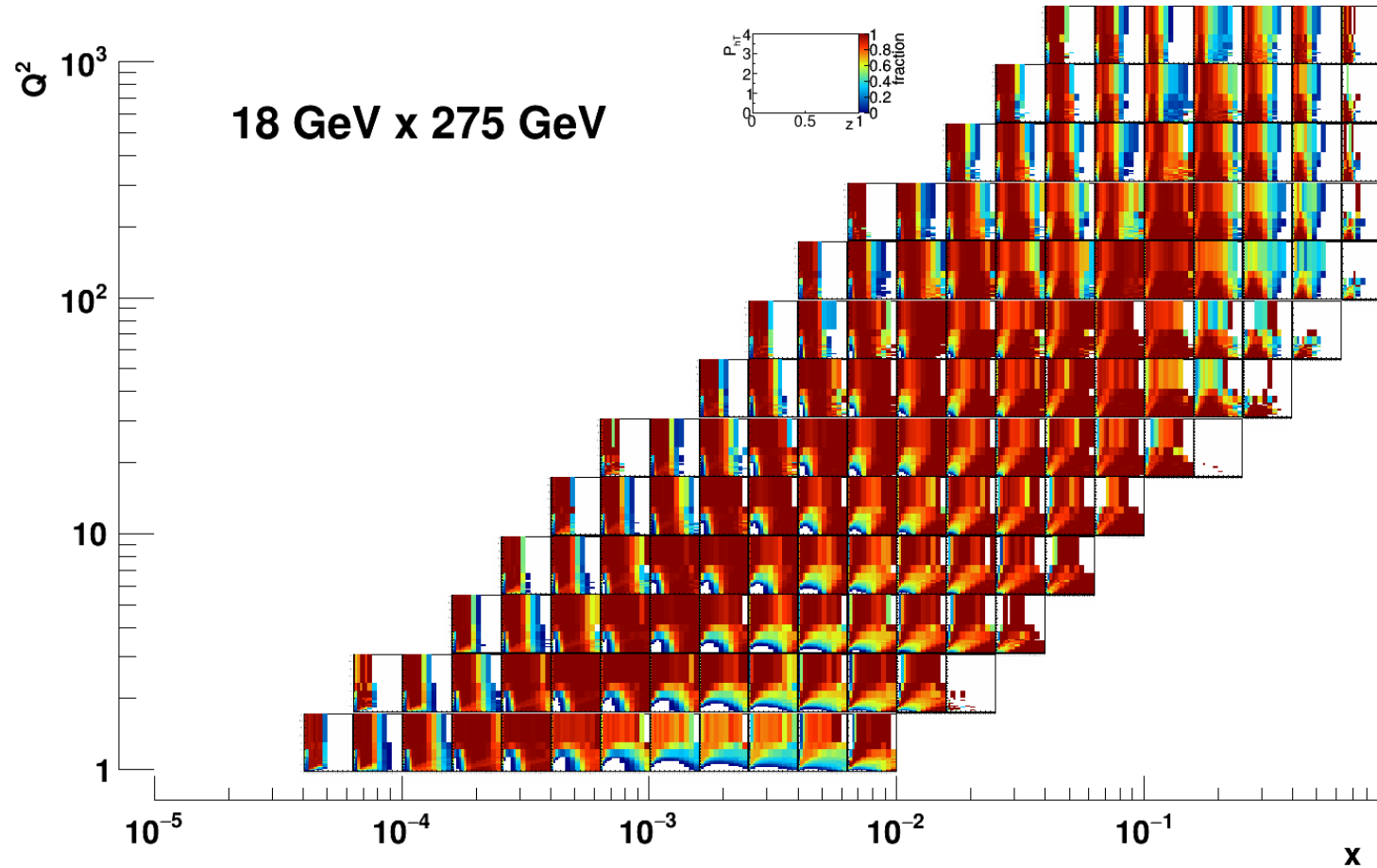
SIDIS Request



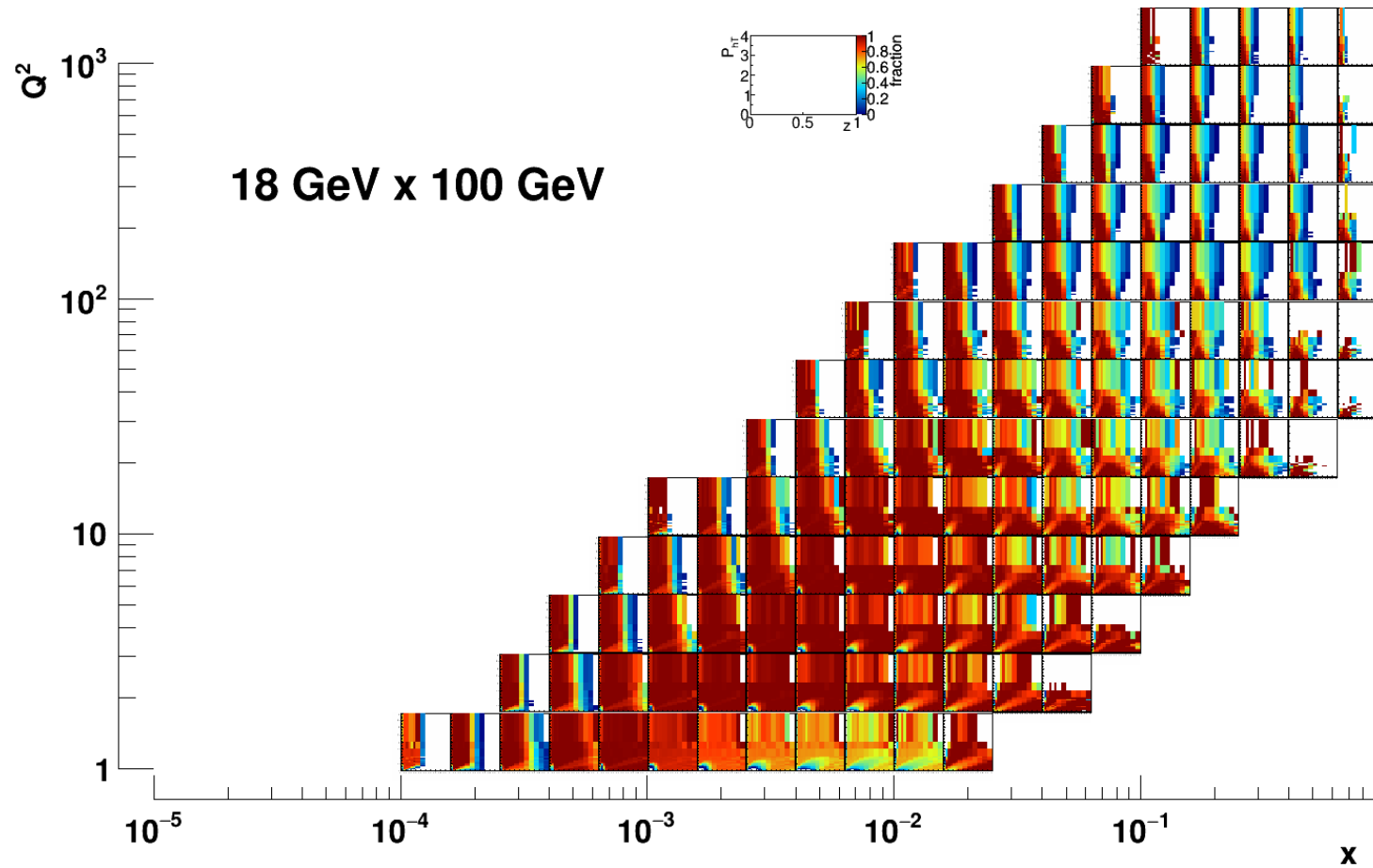
Anselm Request



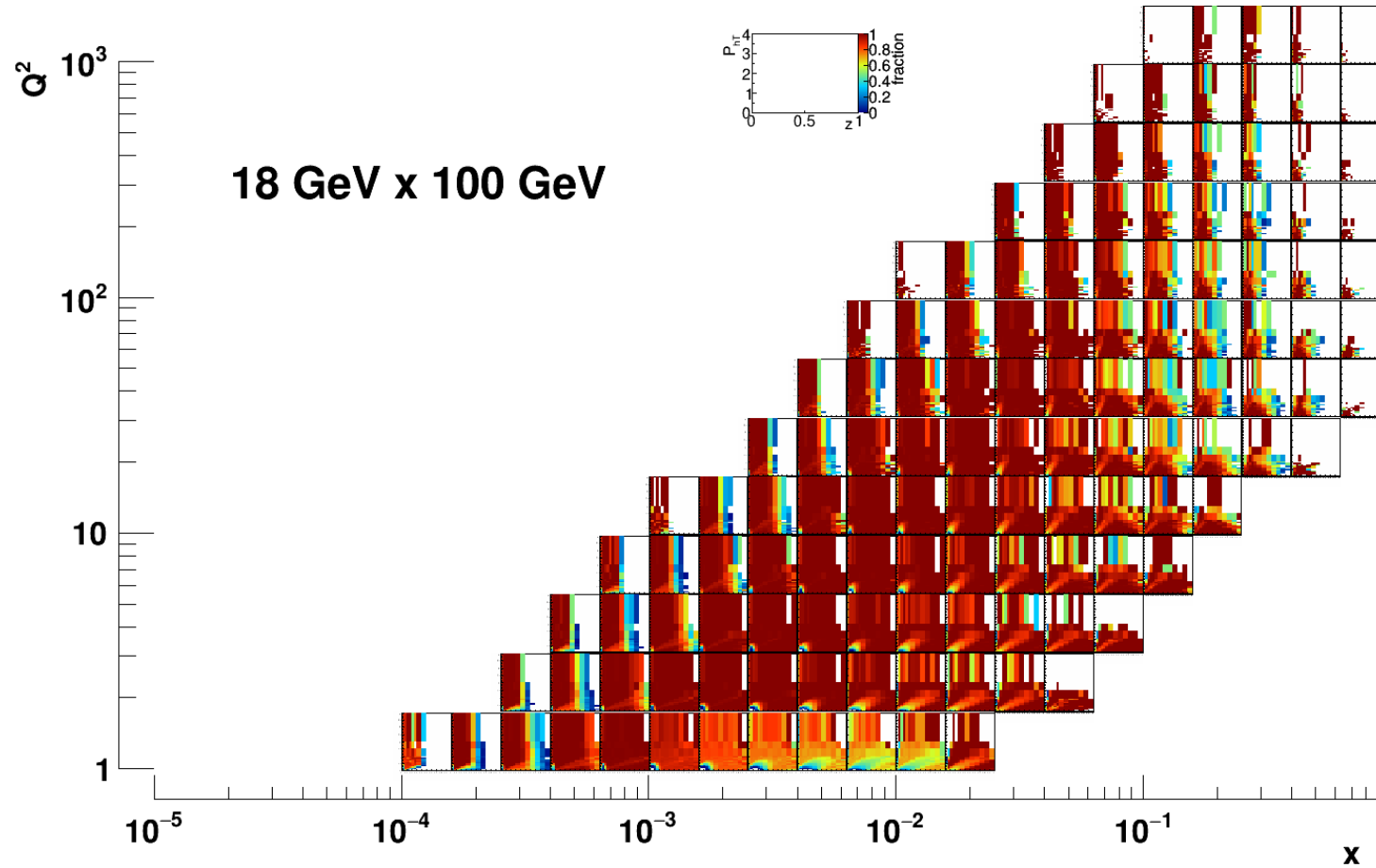
Low p cut



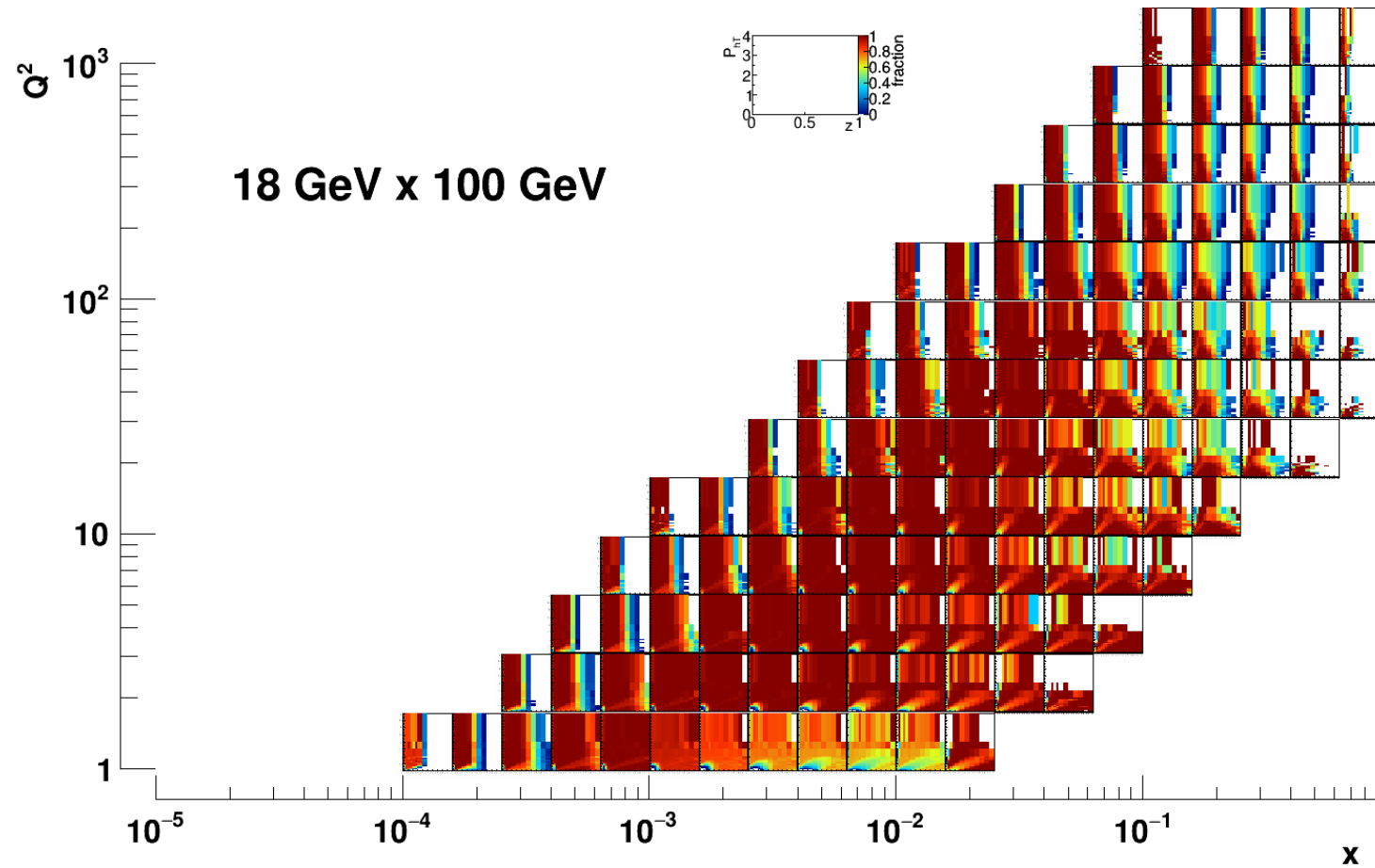
Matrix



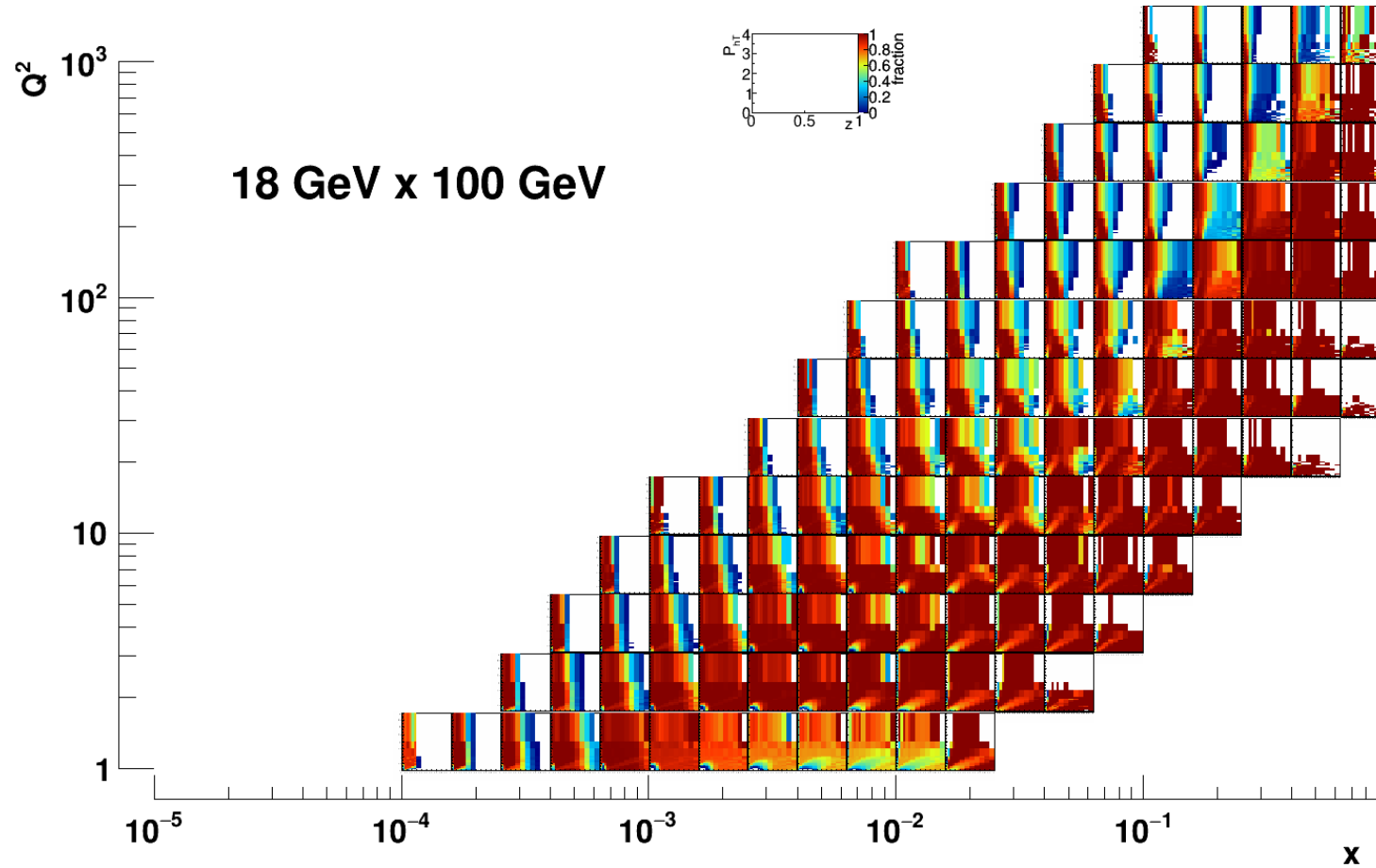
SIDIS



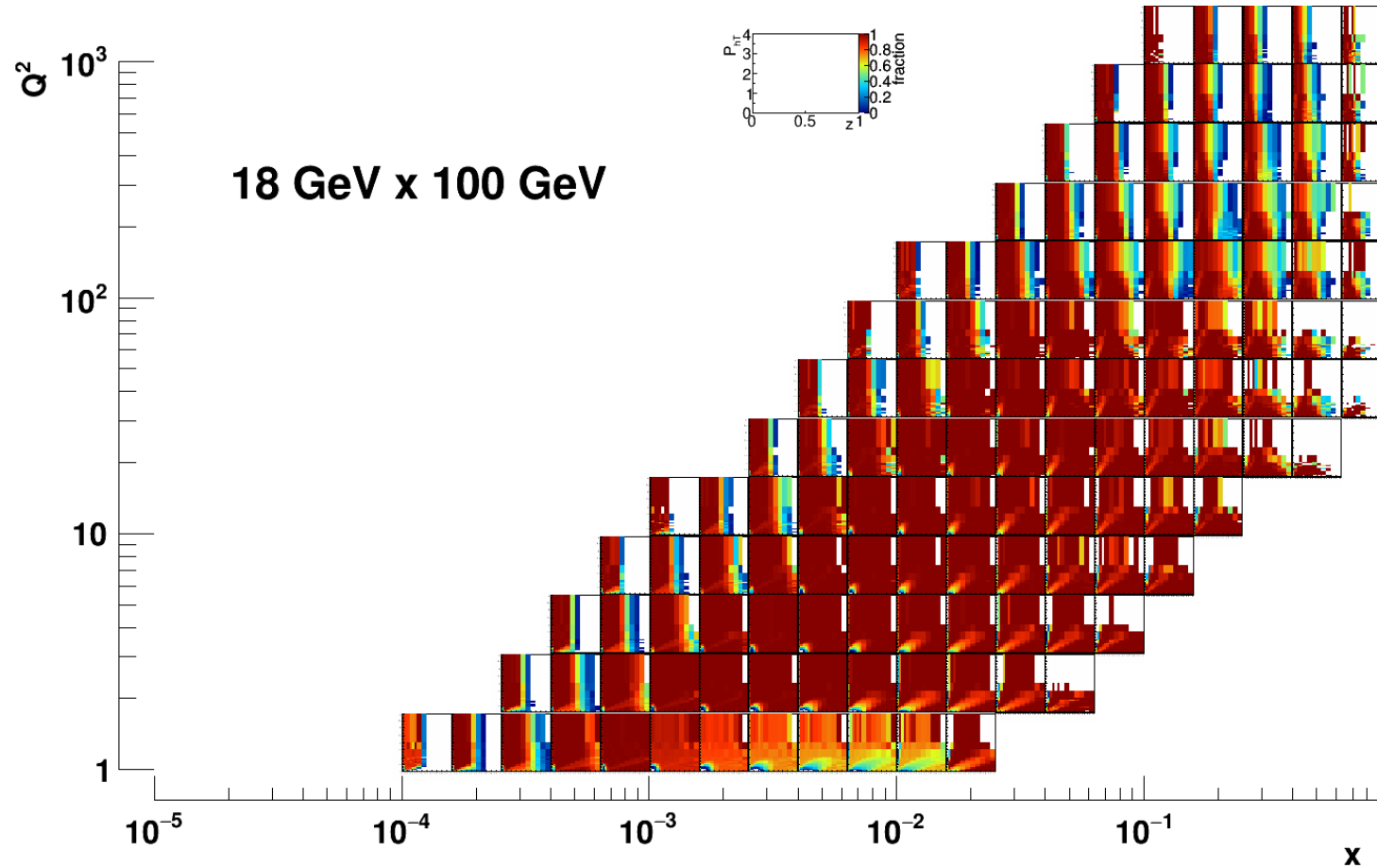
old



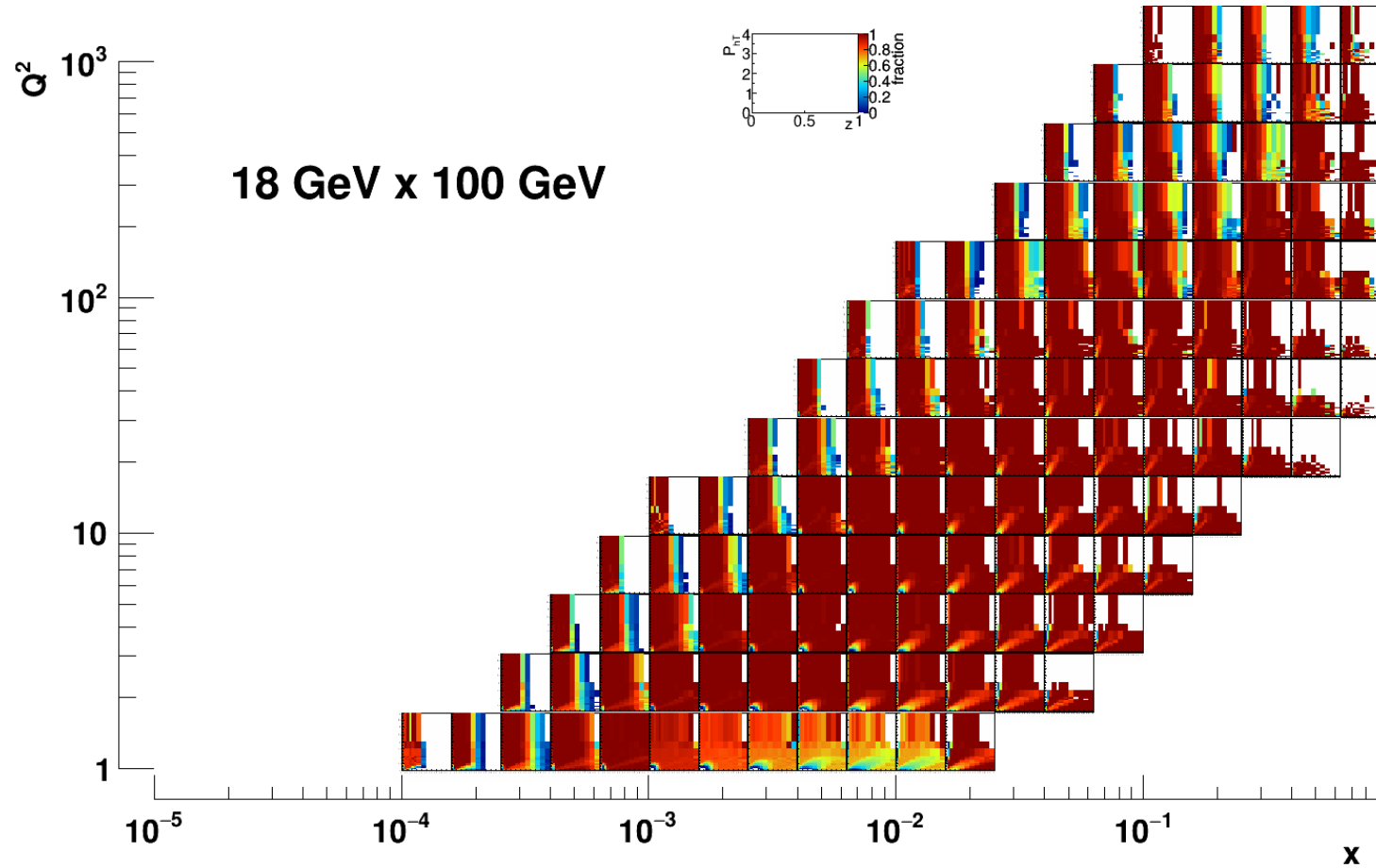
Very high p



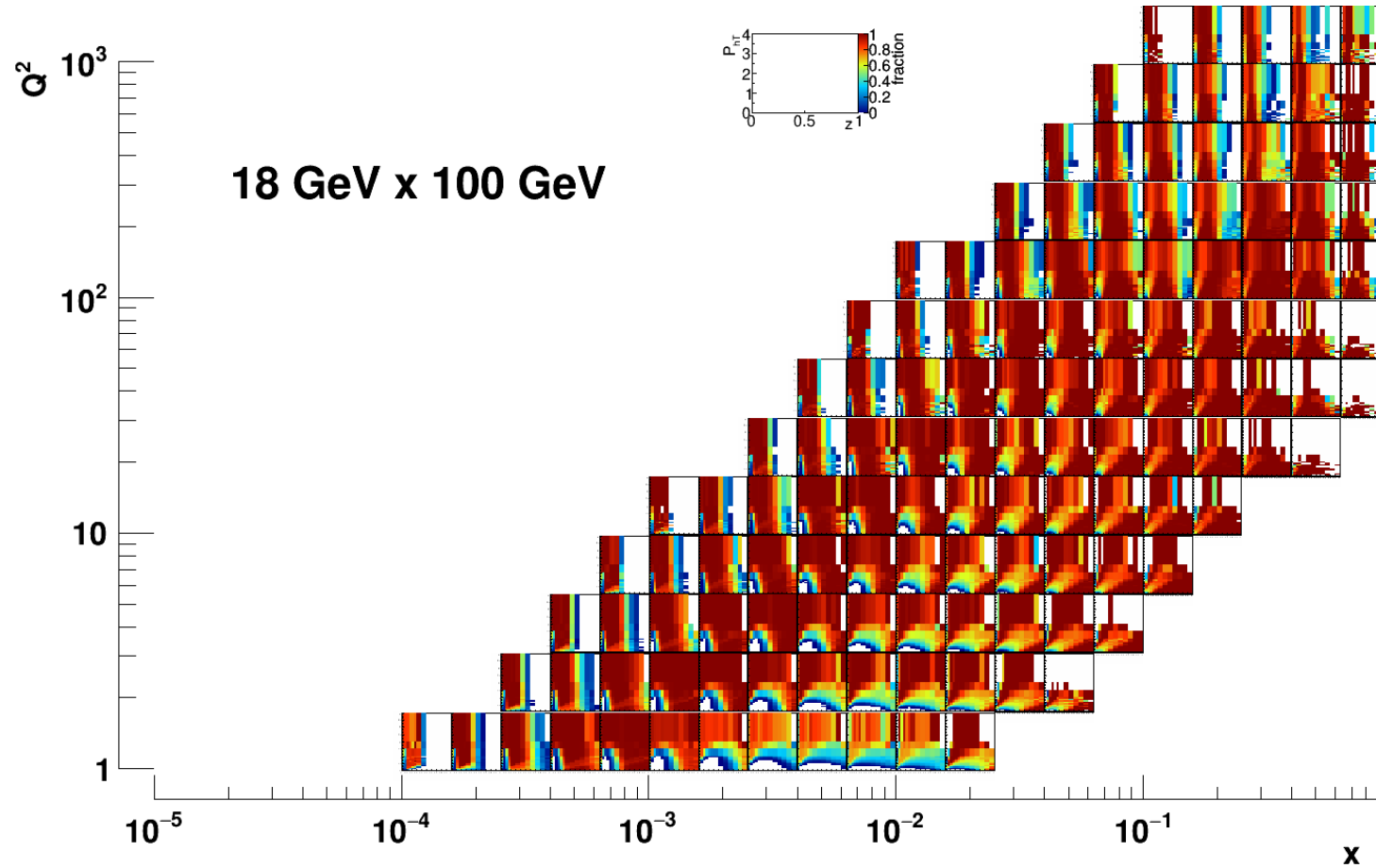
SIDIS request



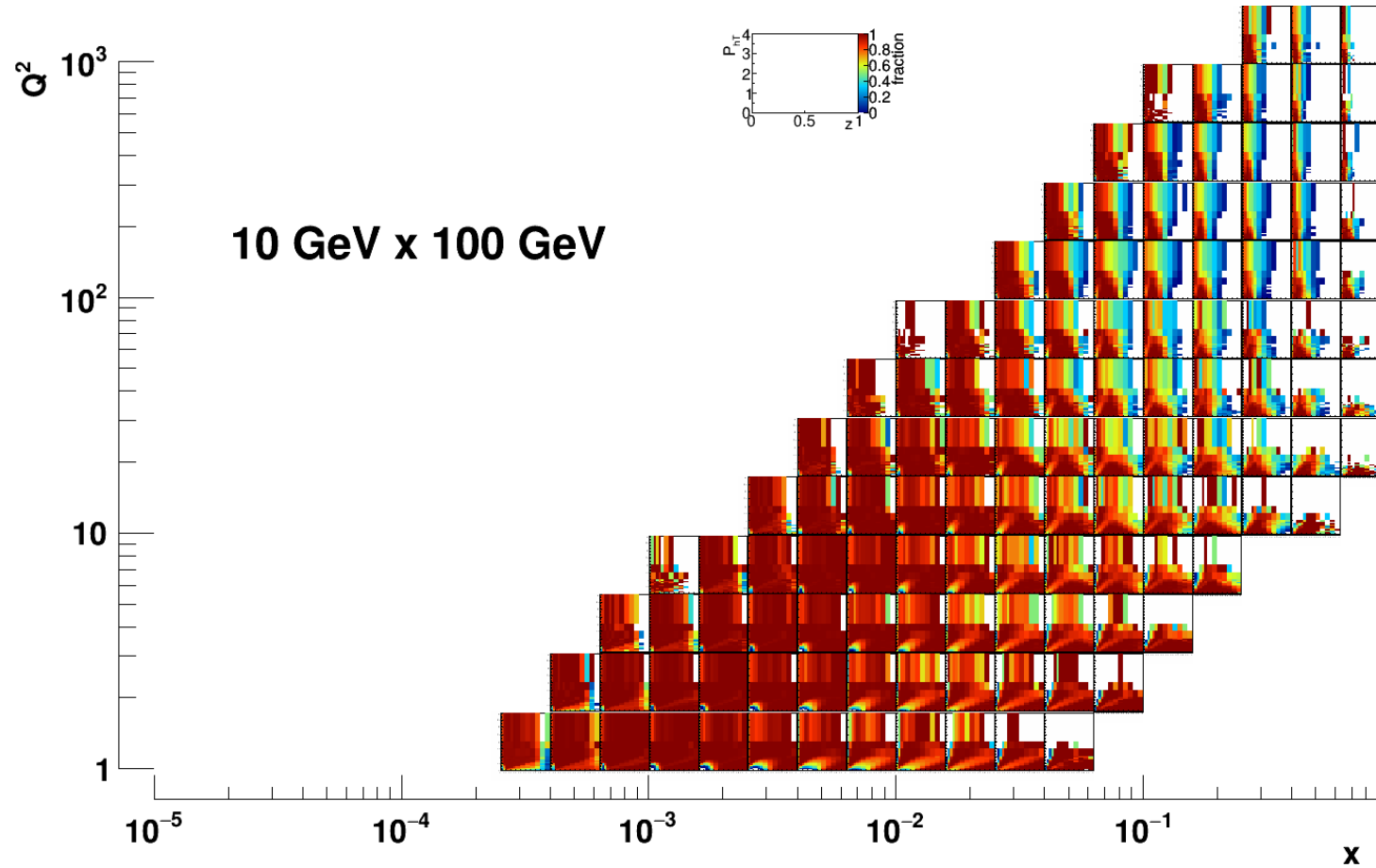
Anselm



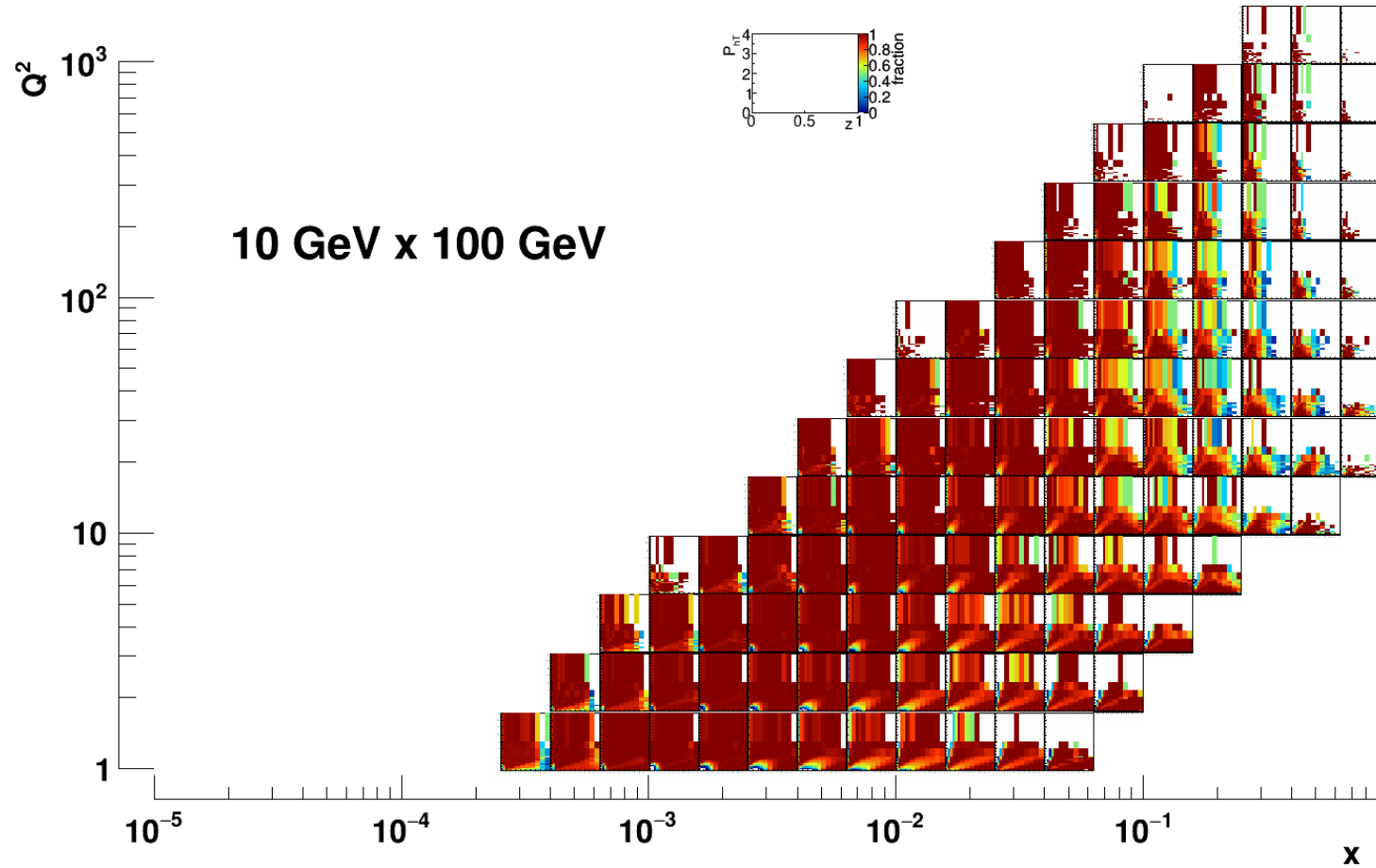
Low p cut



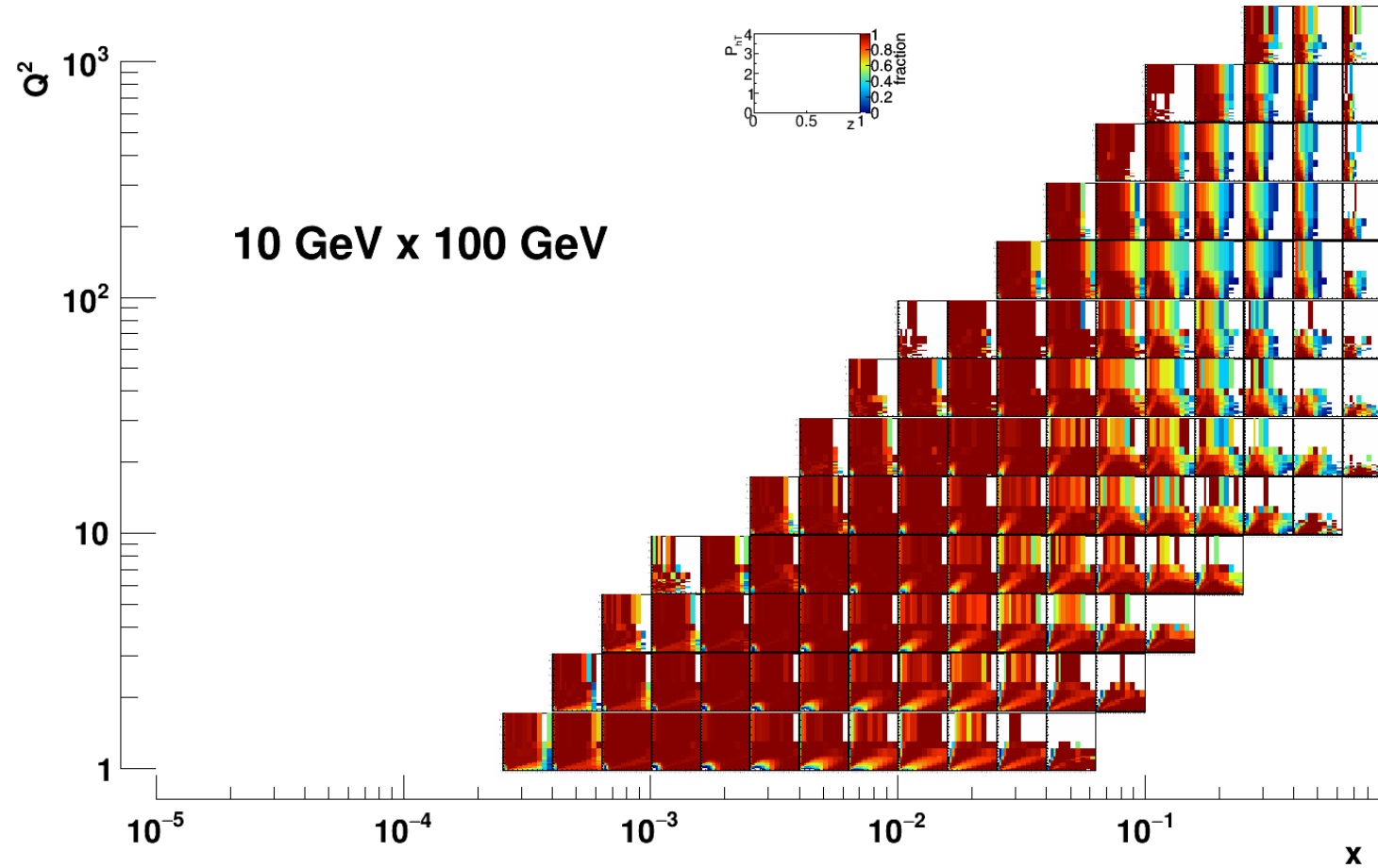
Matrix



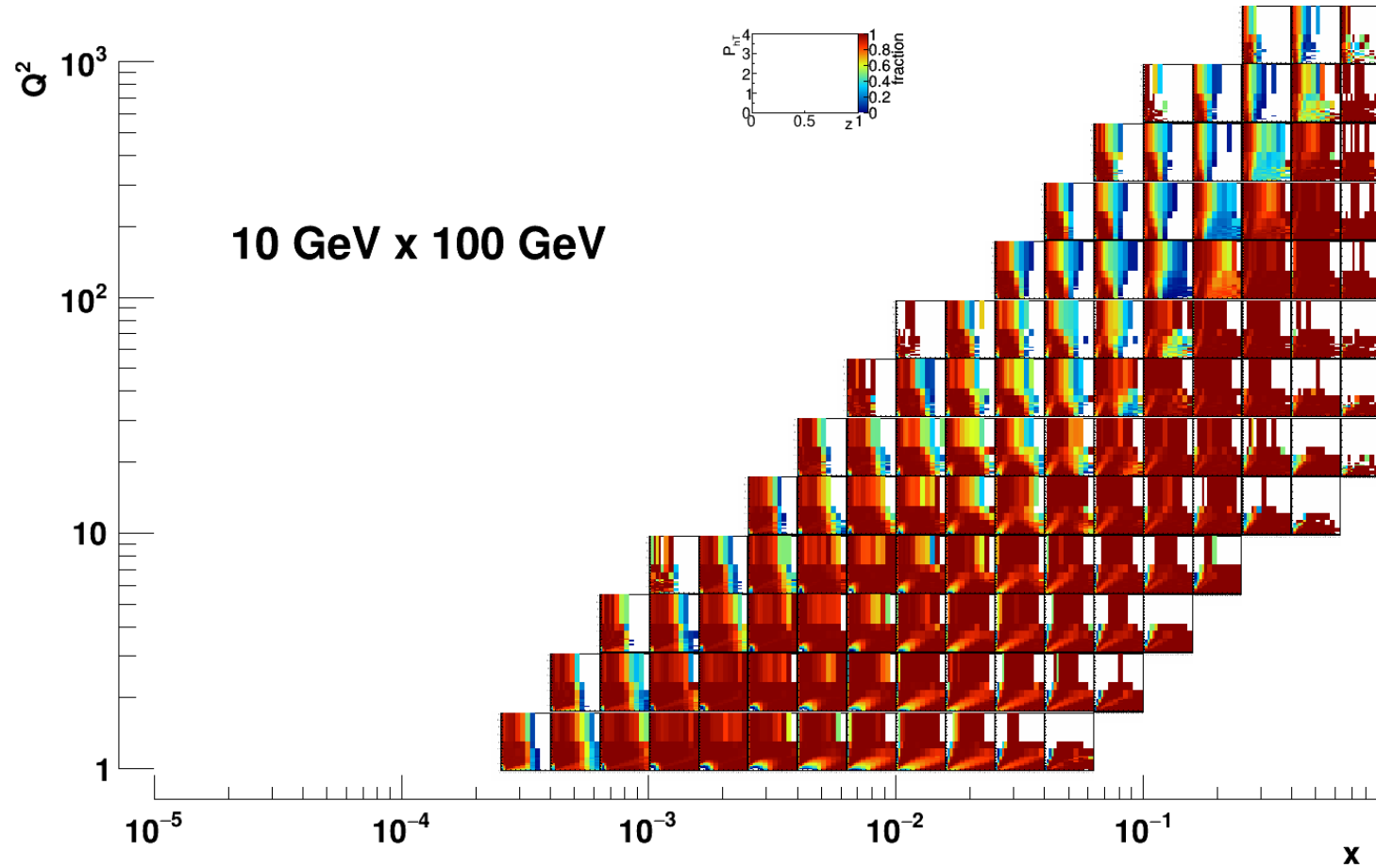
SIDIS



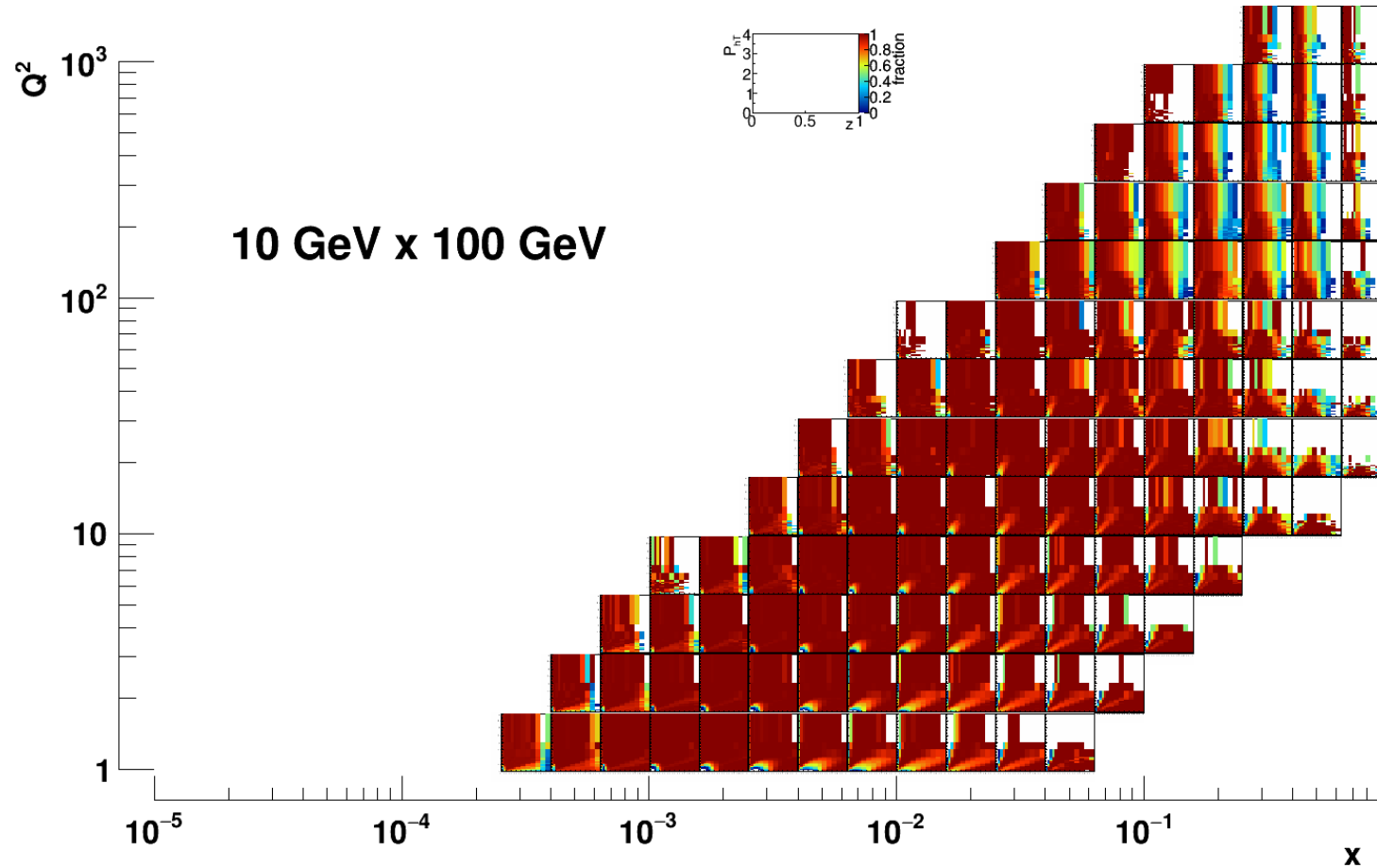
old



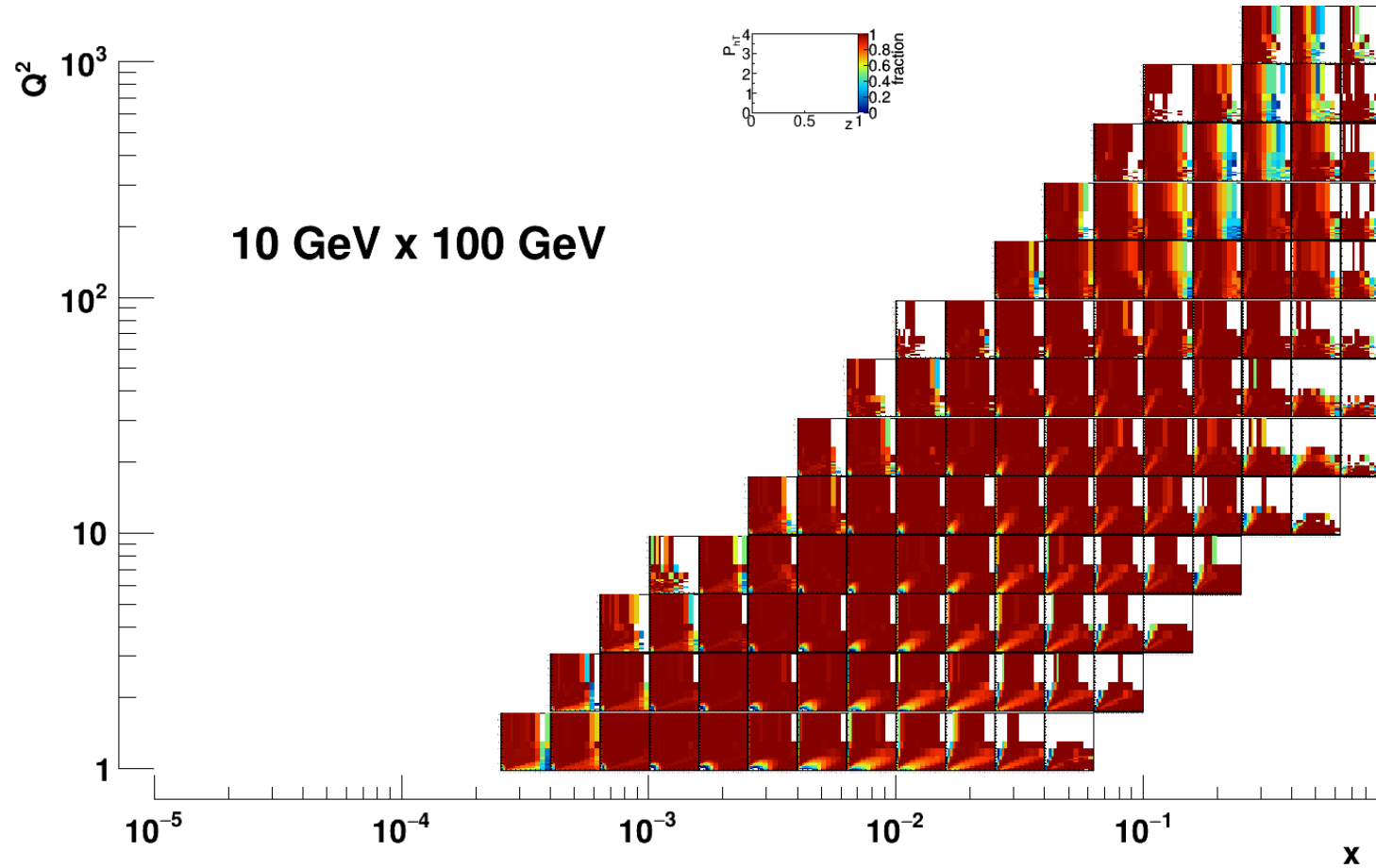
Very high p



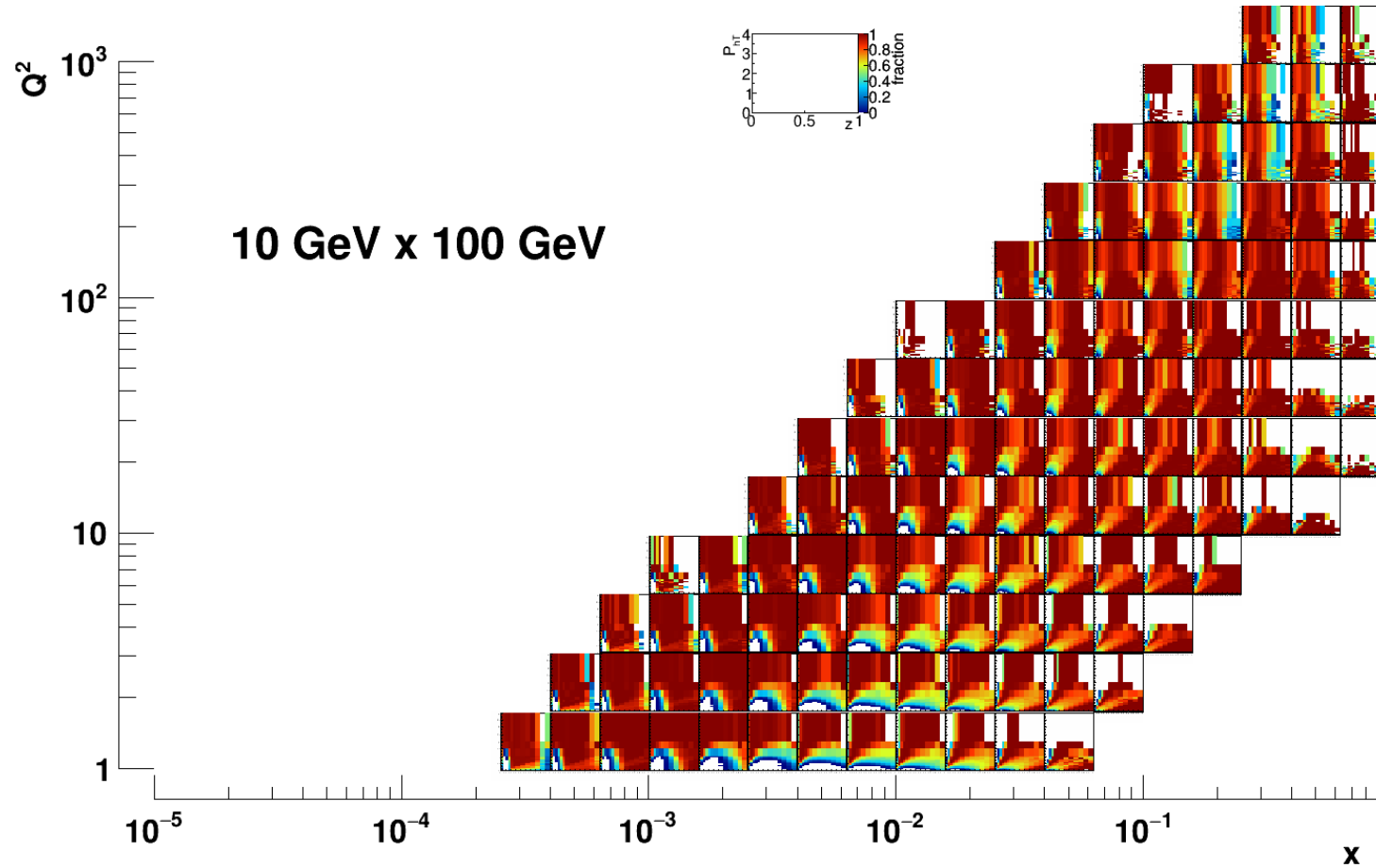
SIDIS request



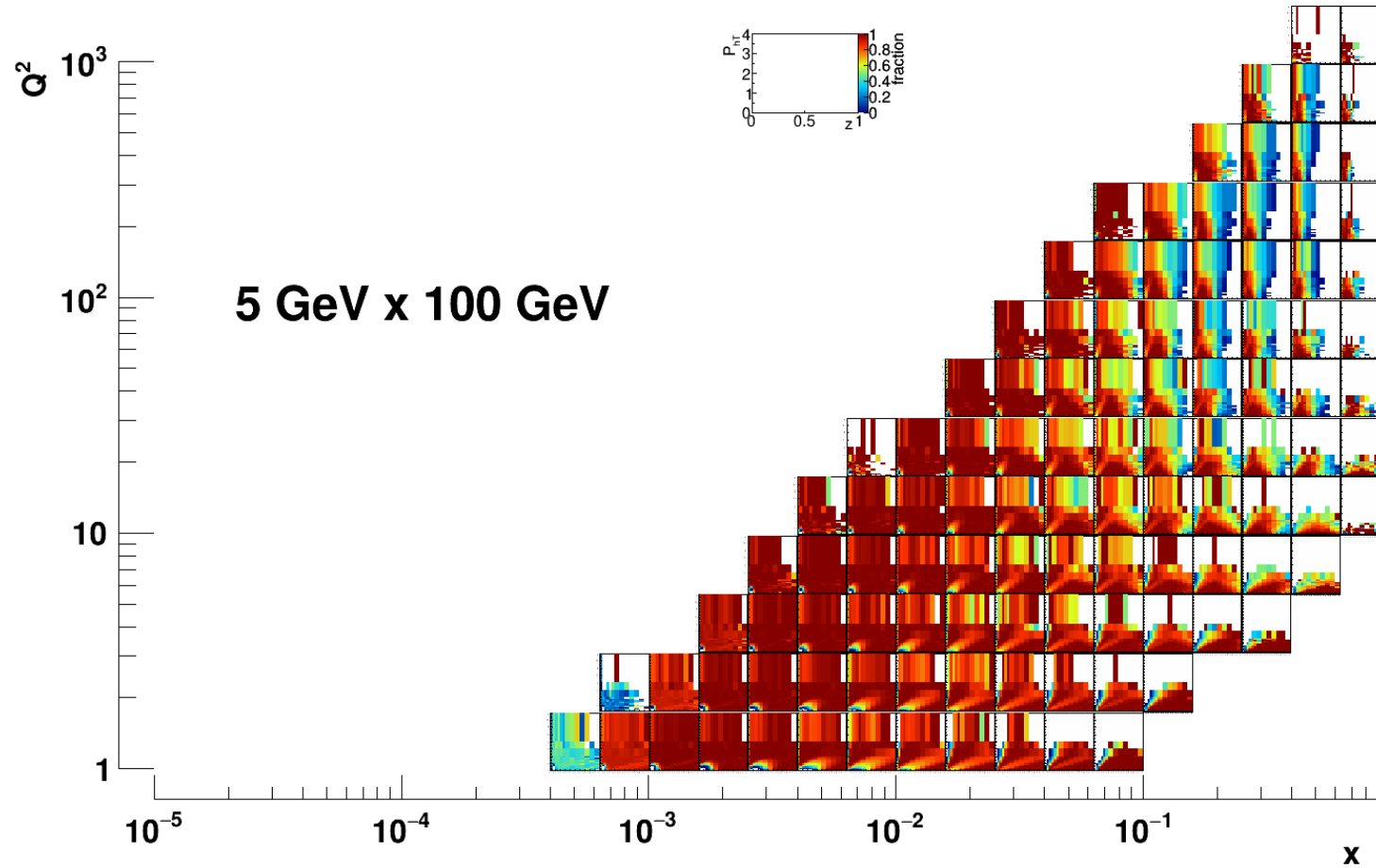
Anselm



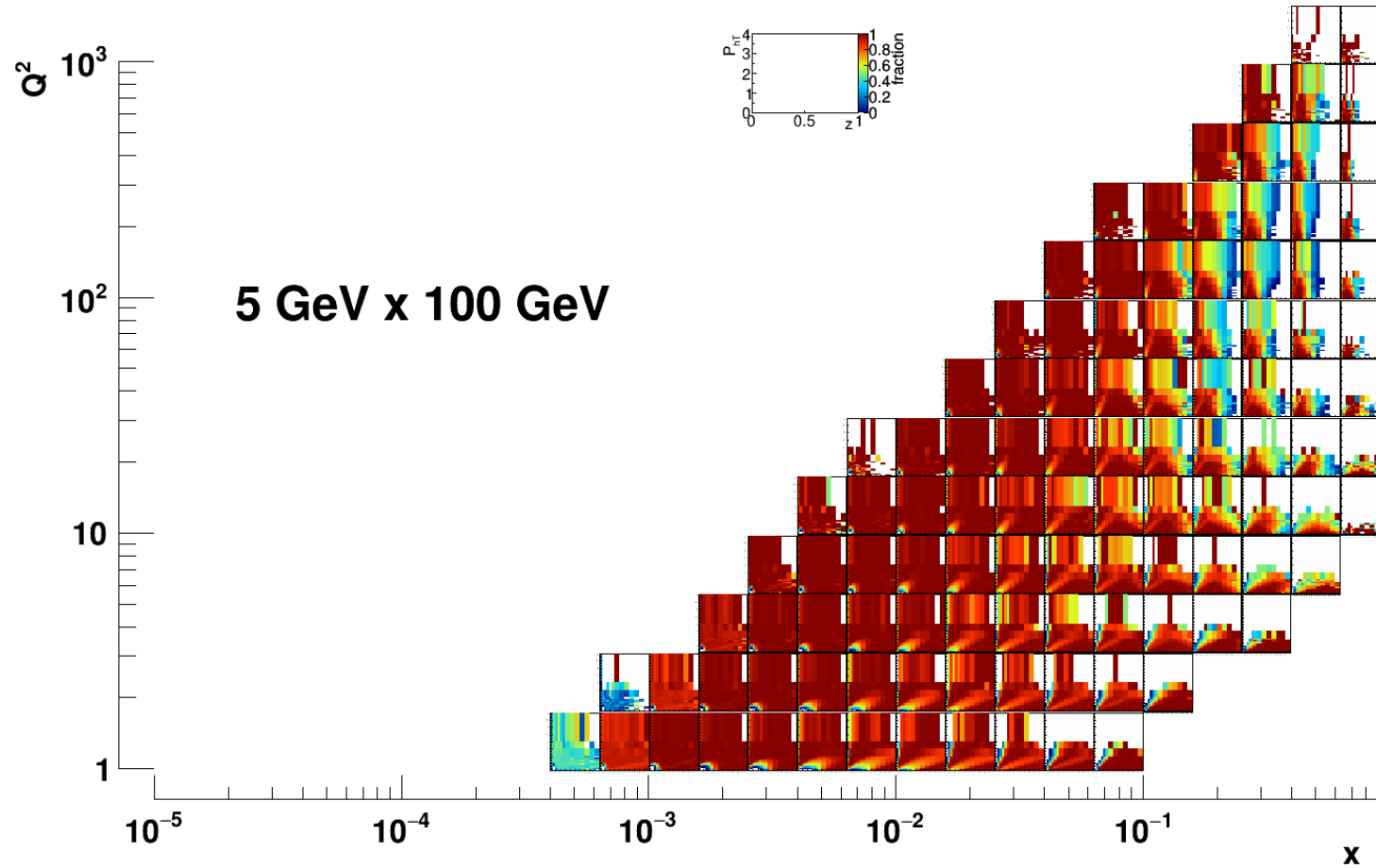
Low p cut



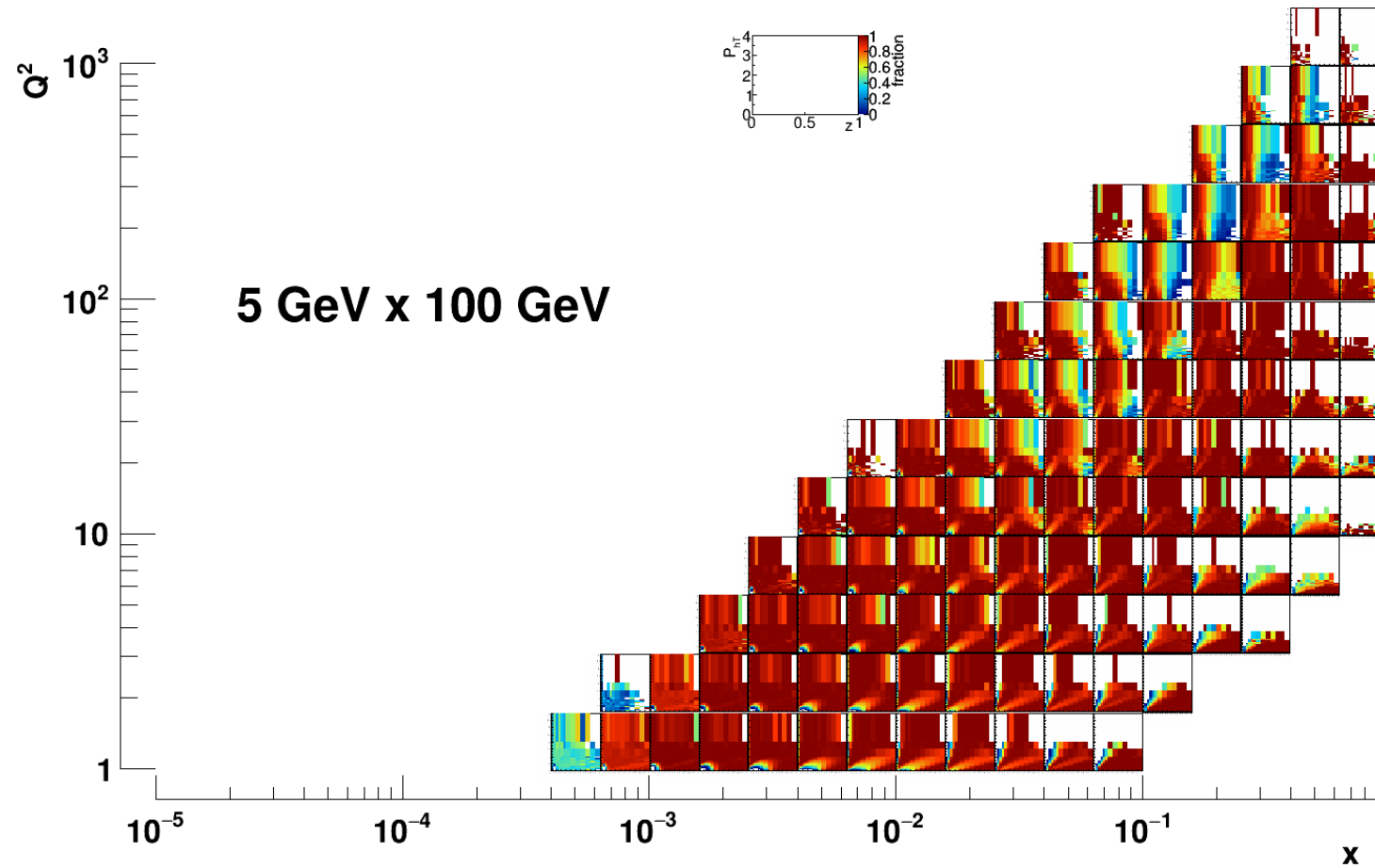
Matrix



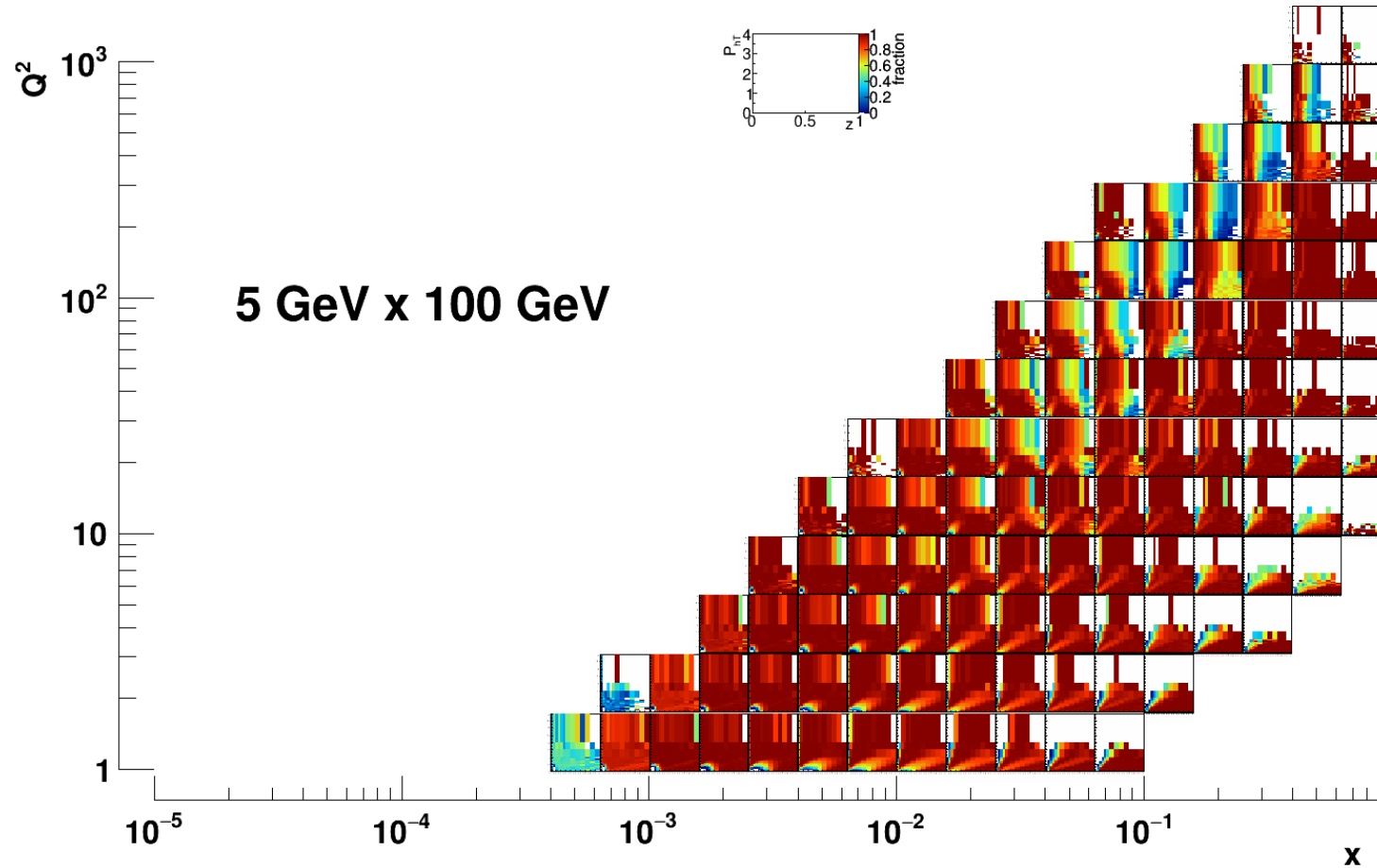
SIDIS



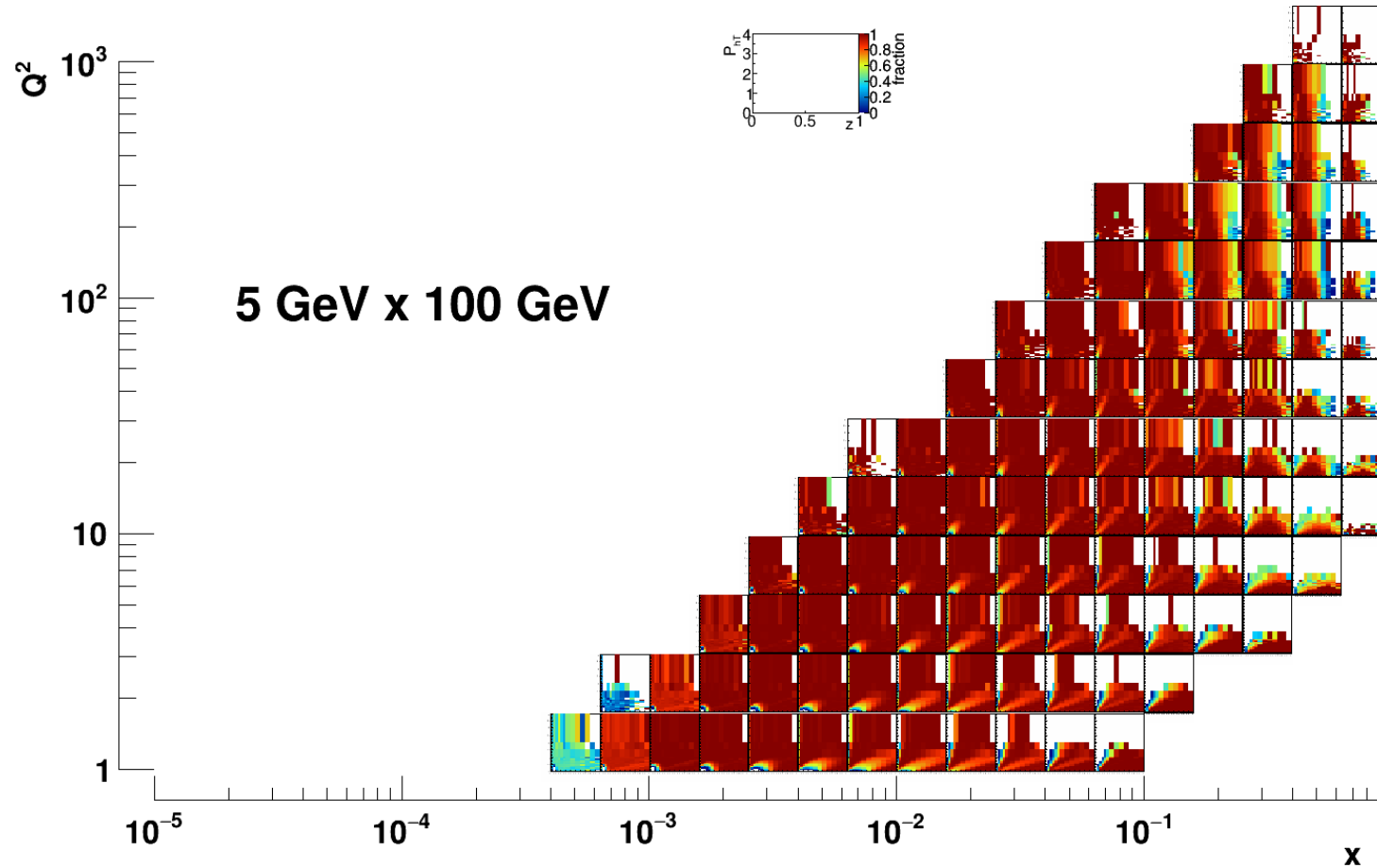
old



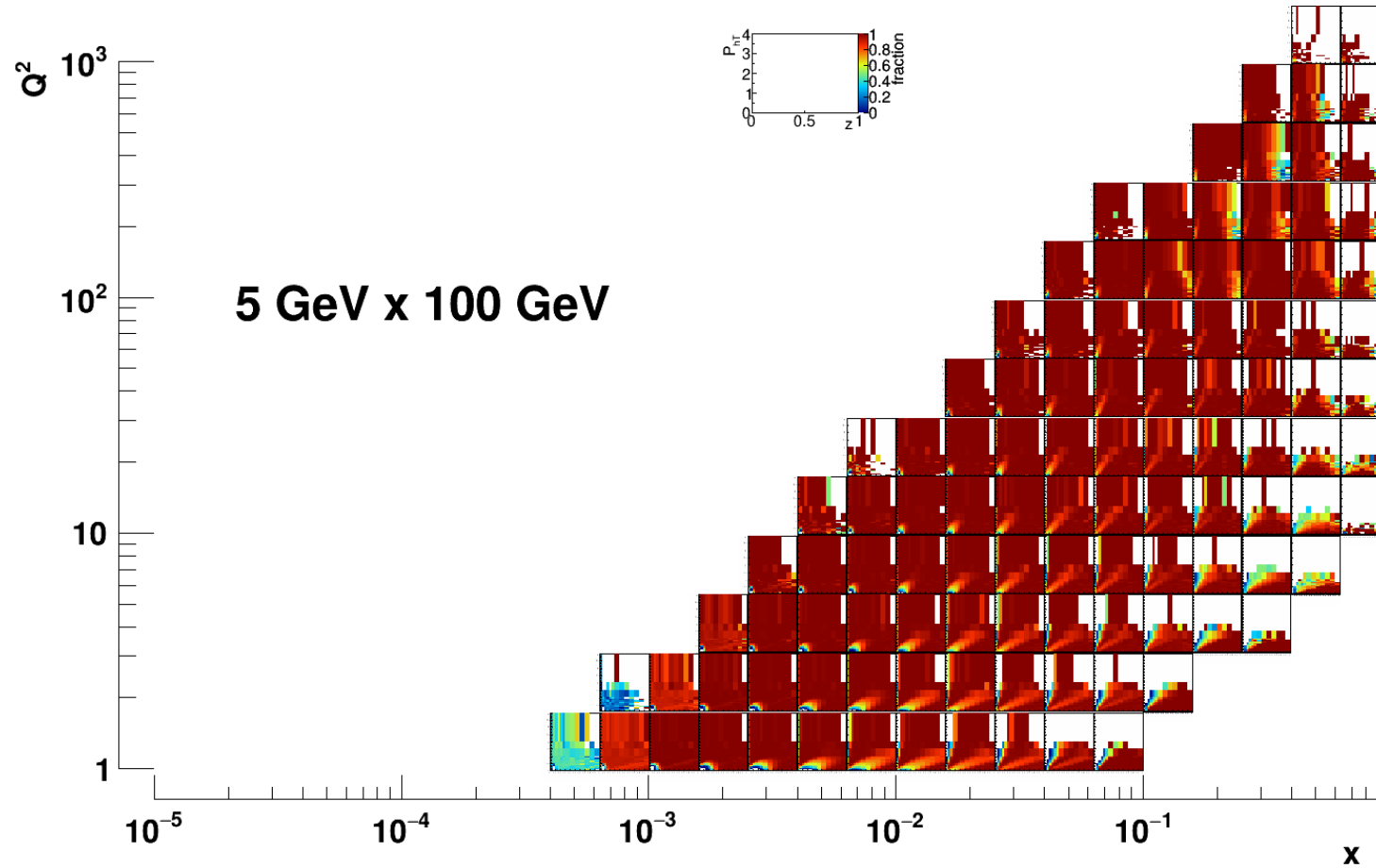
Very high p



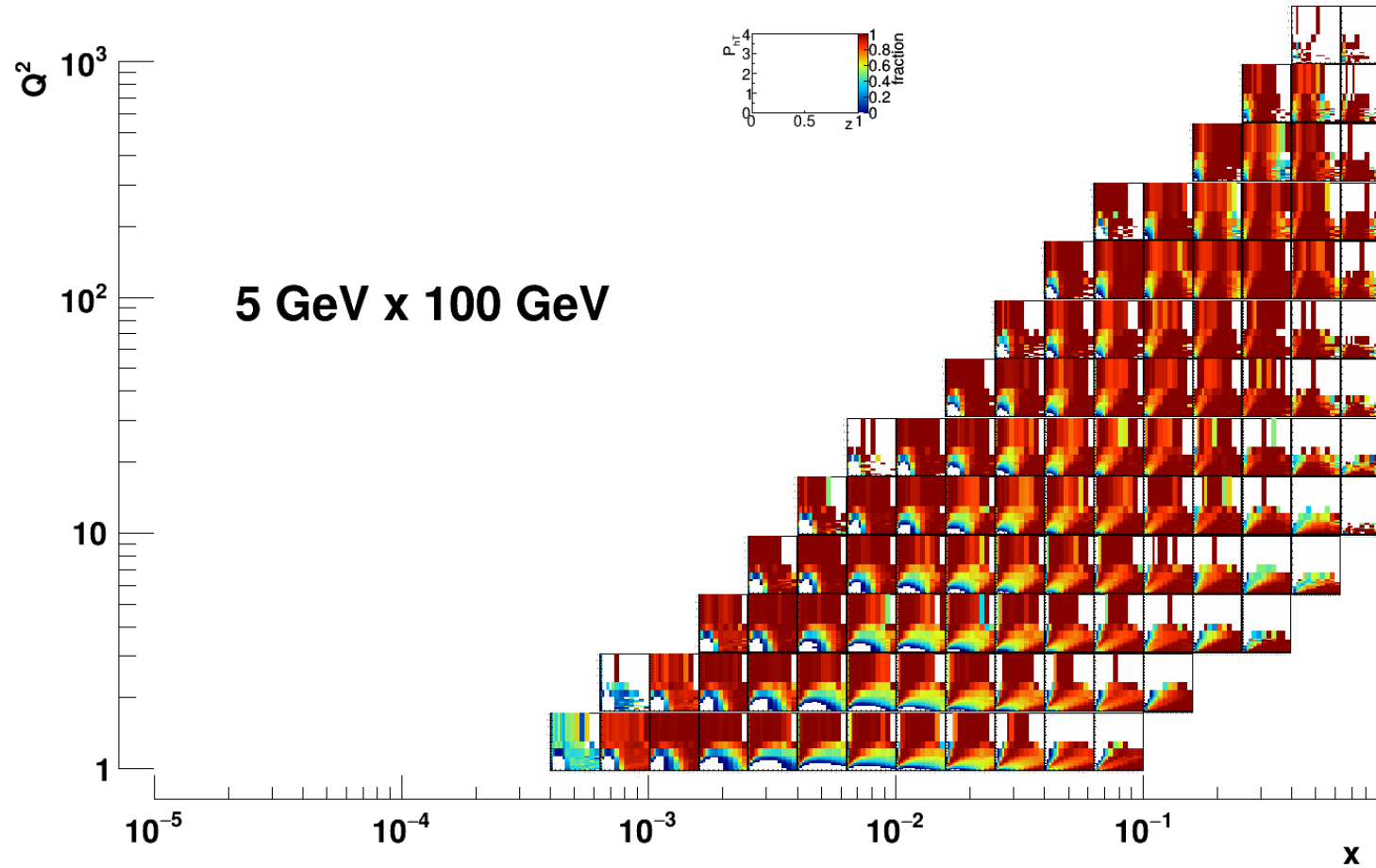
SIDIS Request



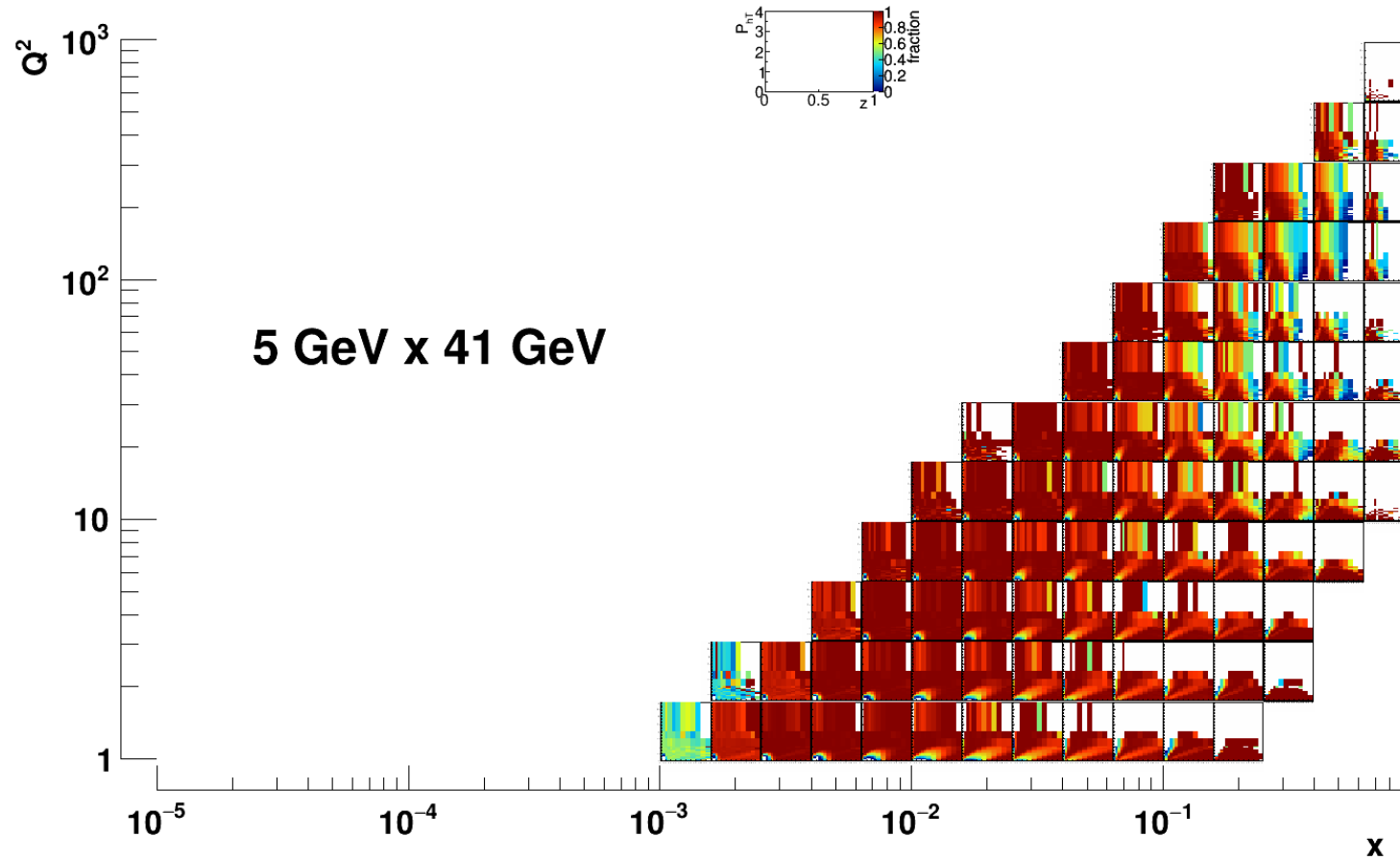
Anselm



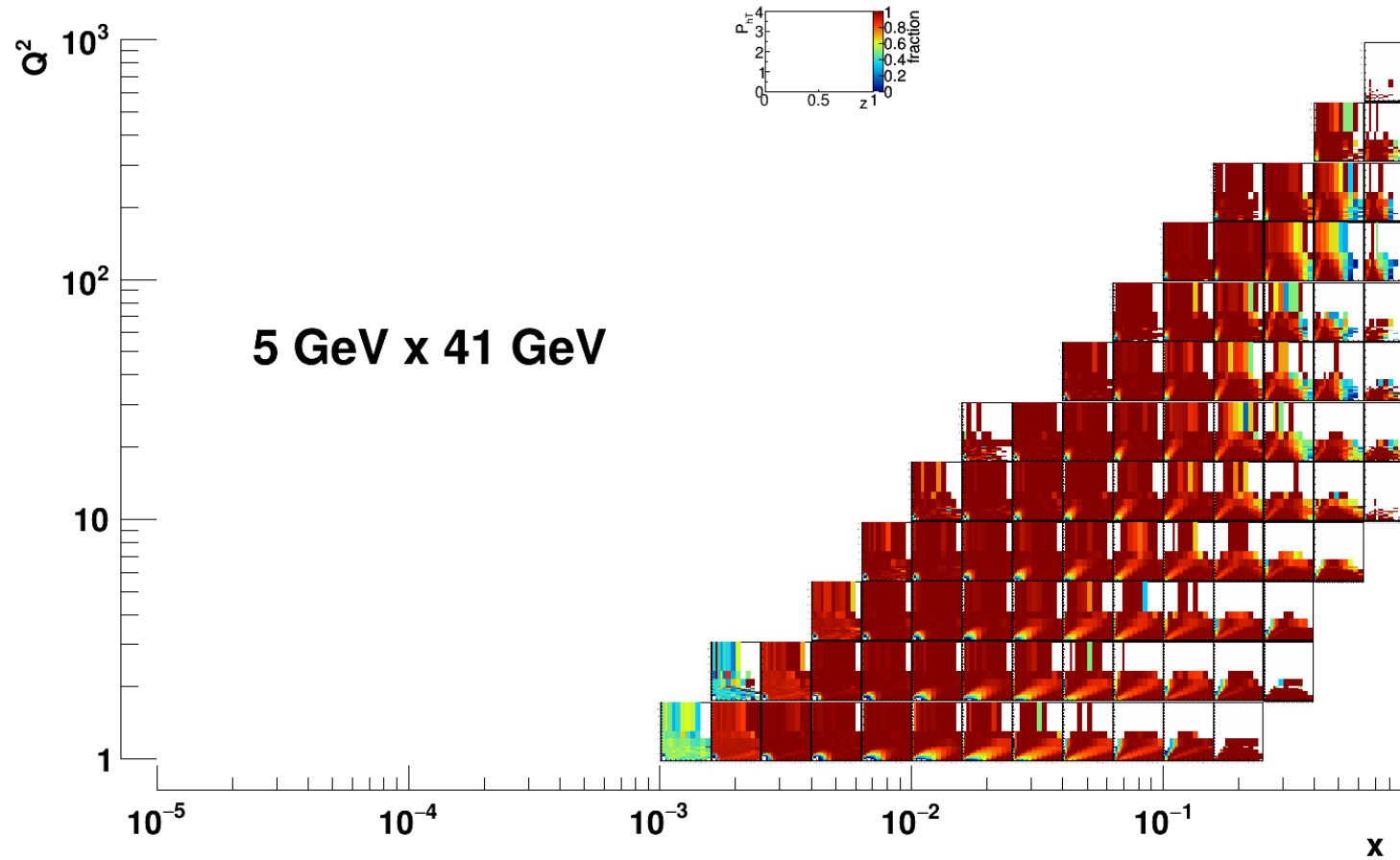
Low p cut



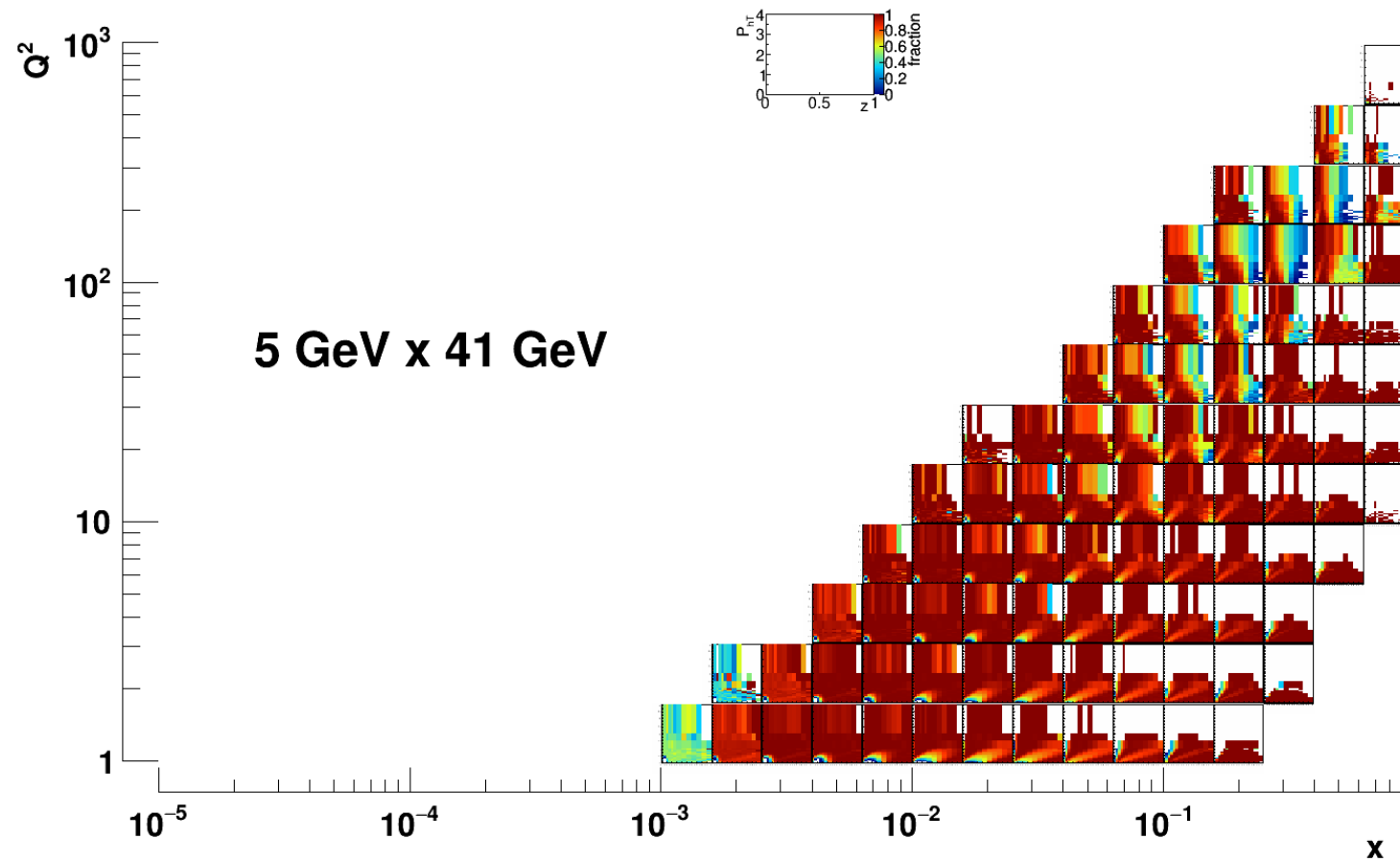
Matrix



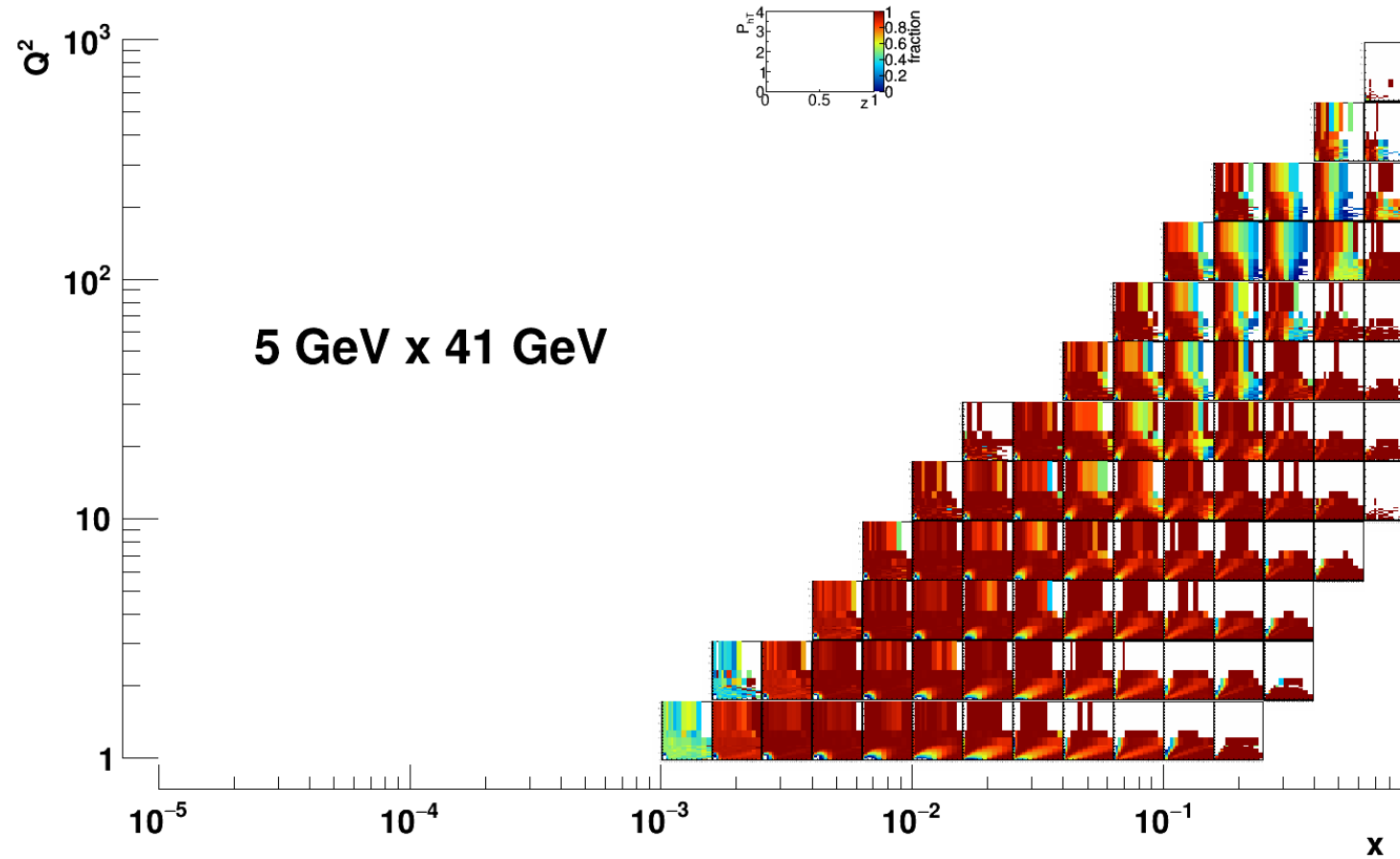
SIDIS



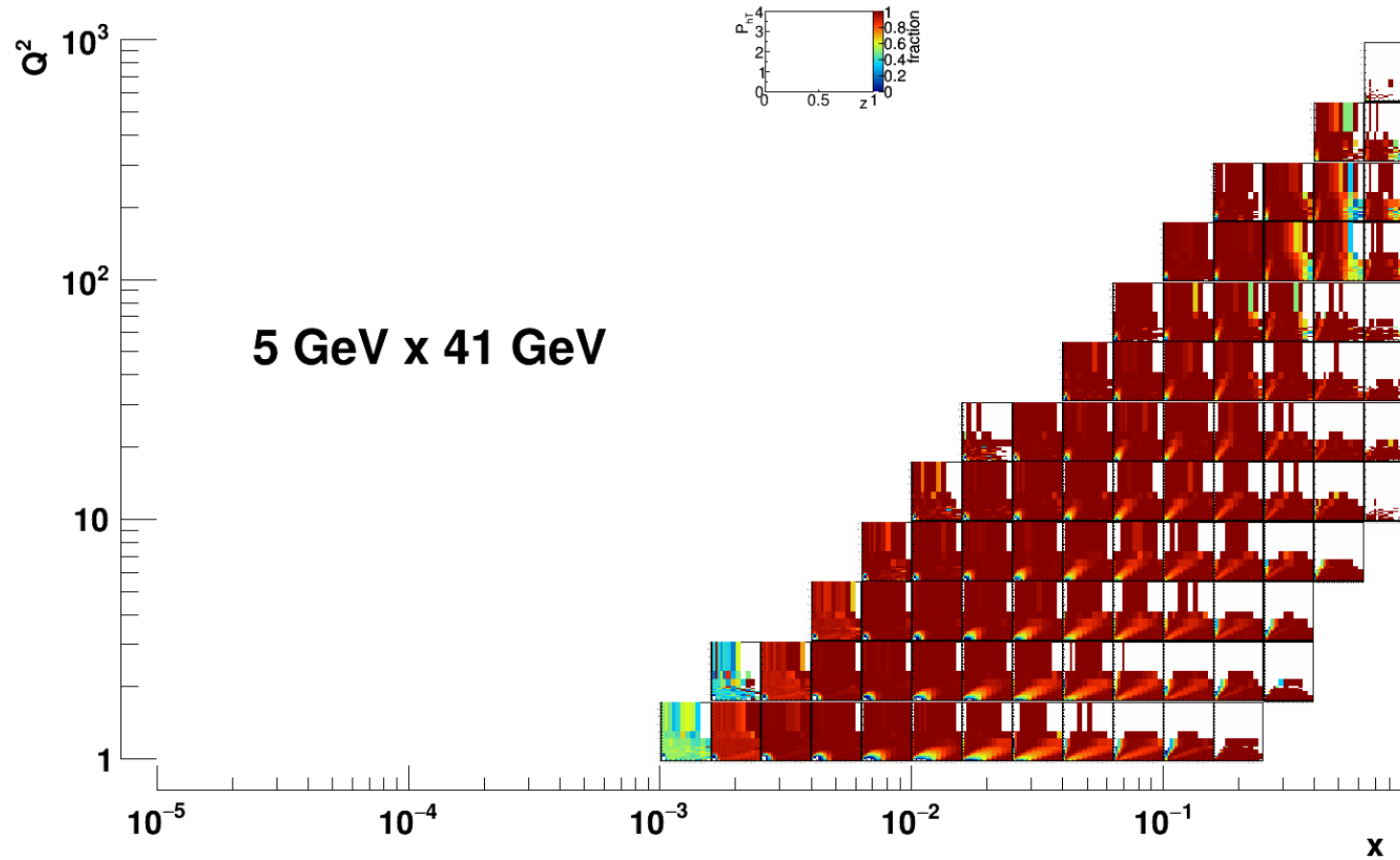
old



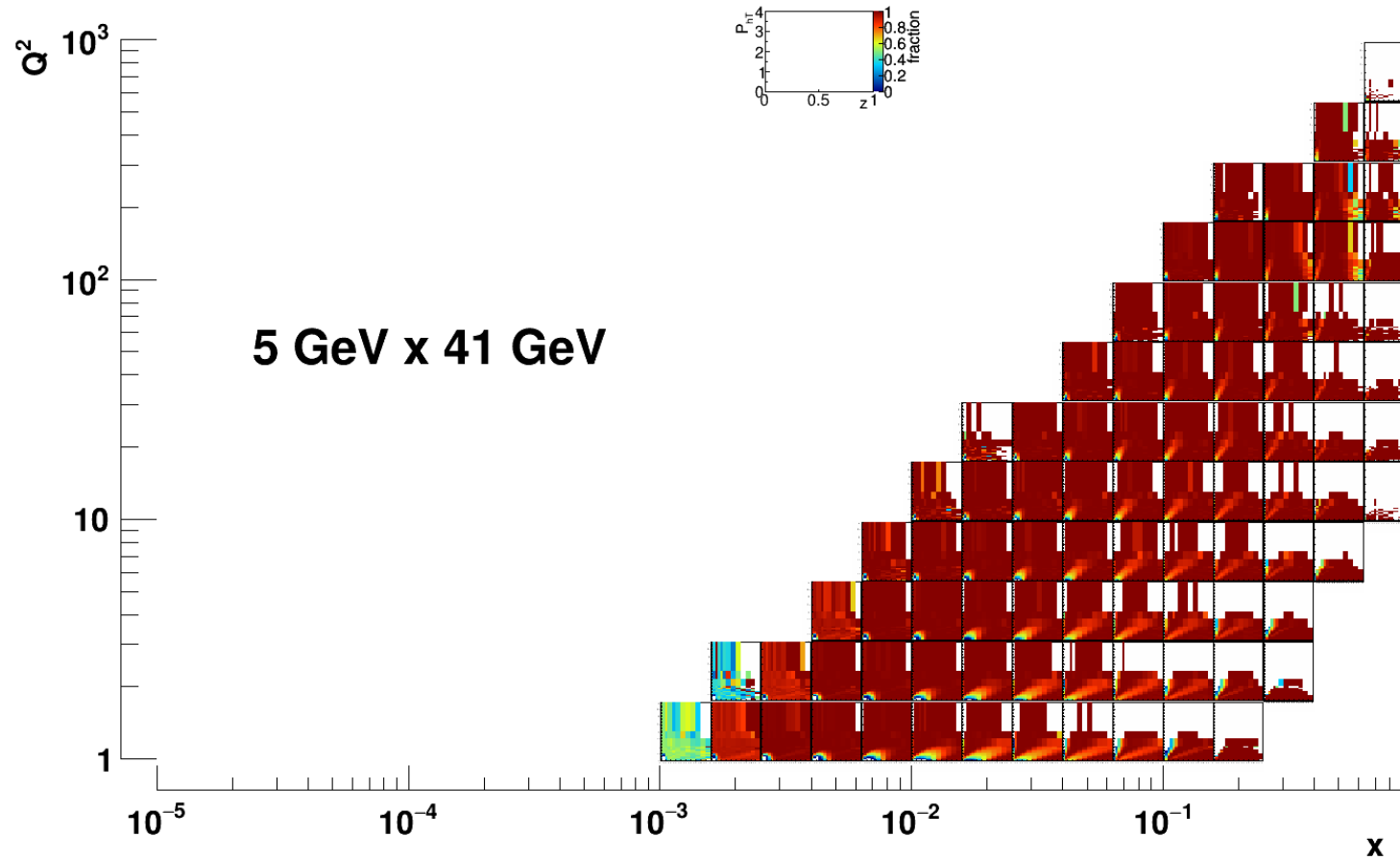
High p



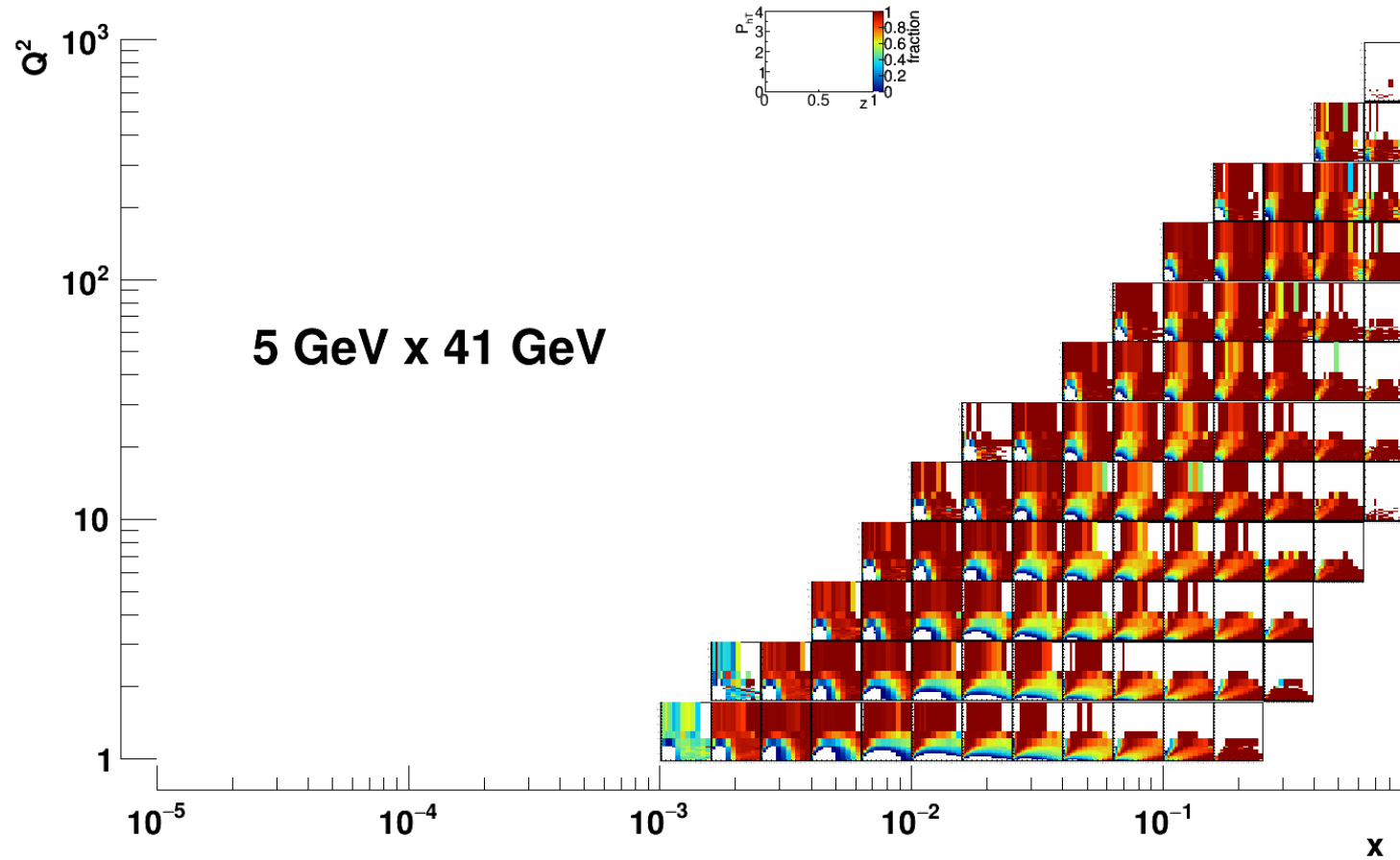
SIDIS request



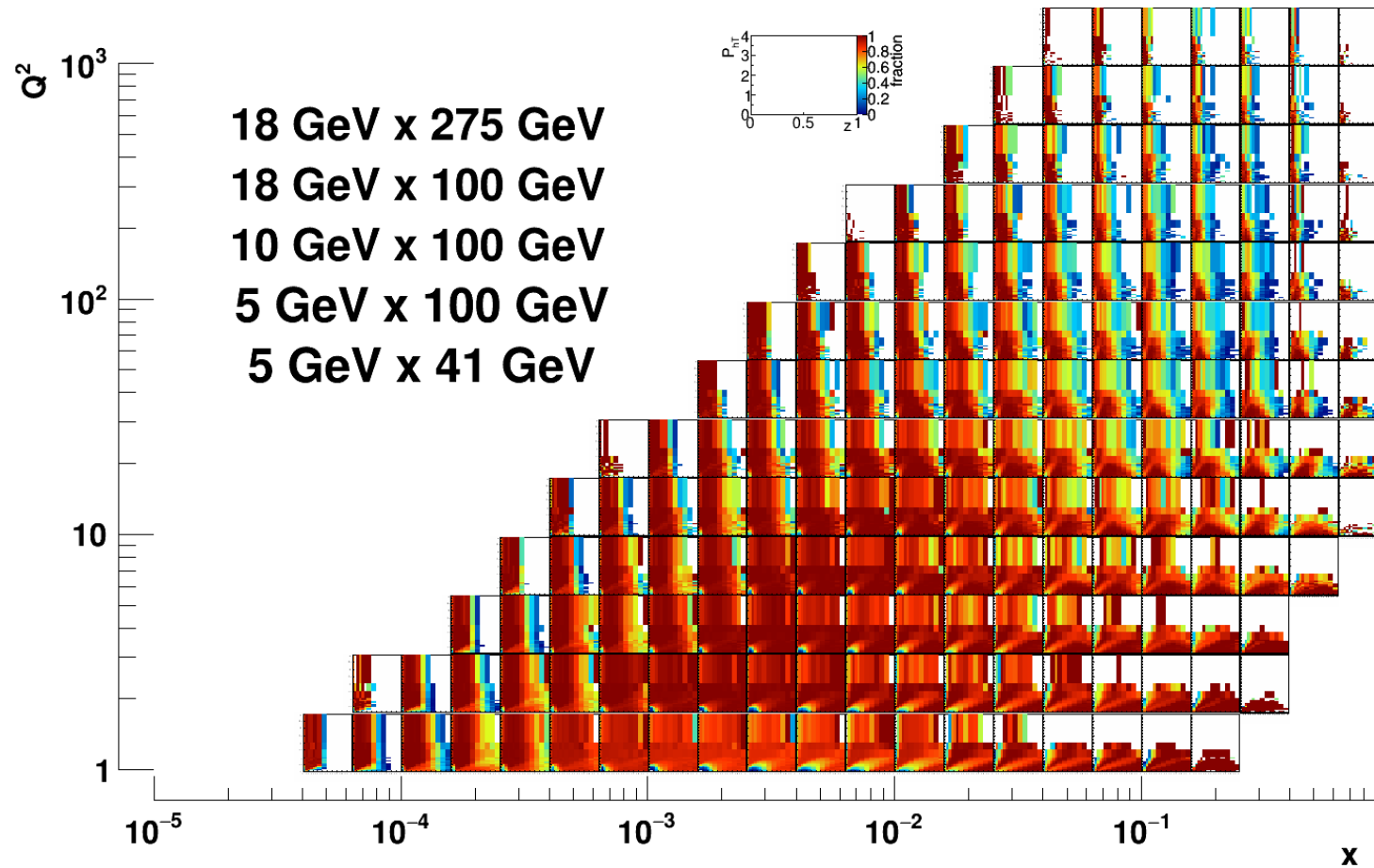
Anselm



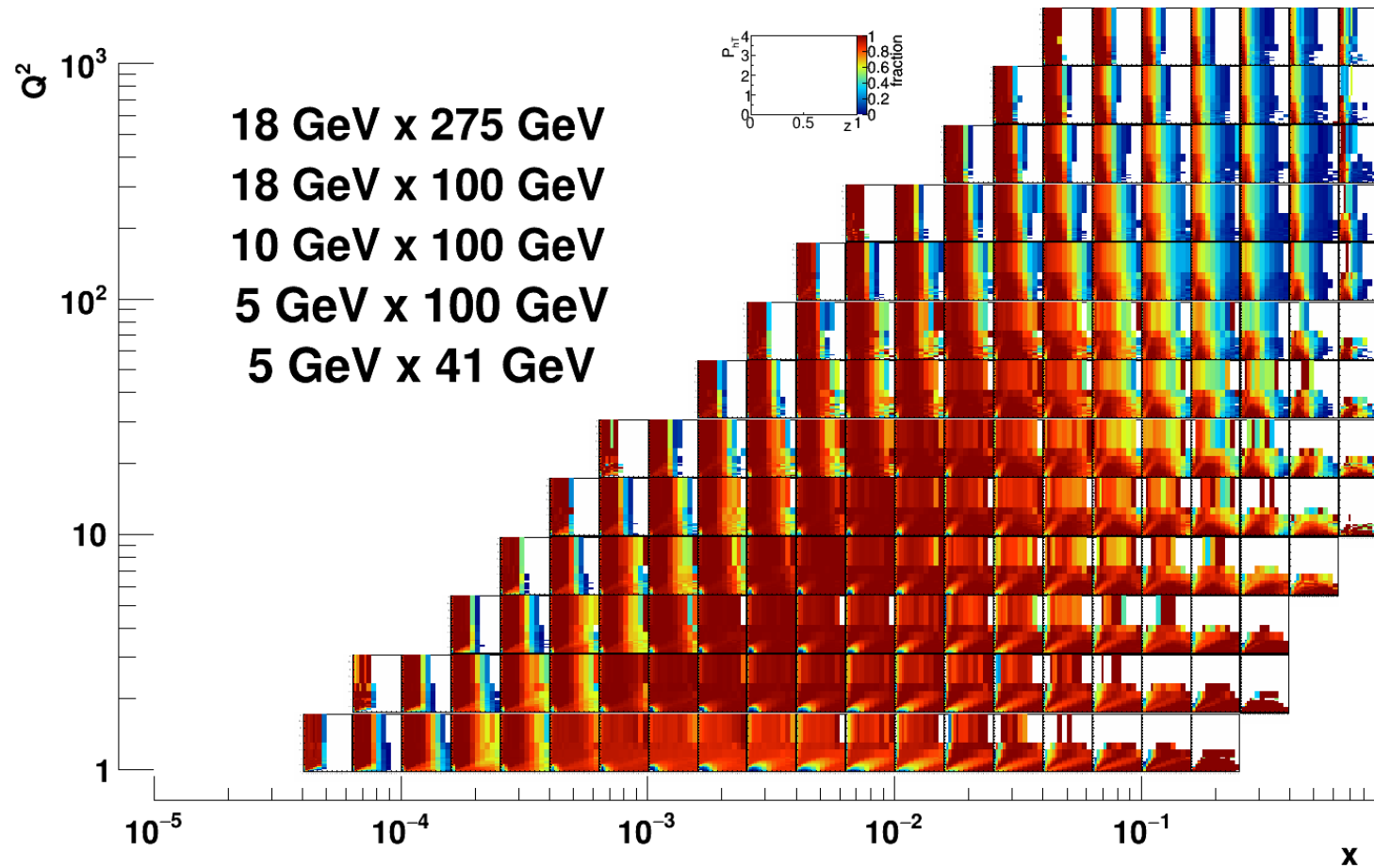
Low p cut



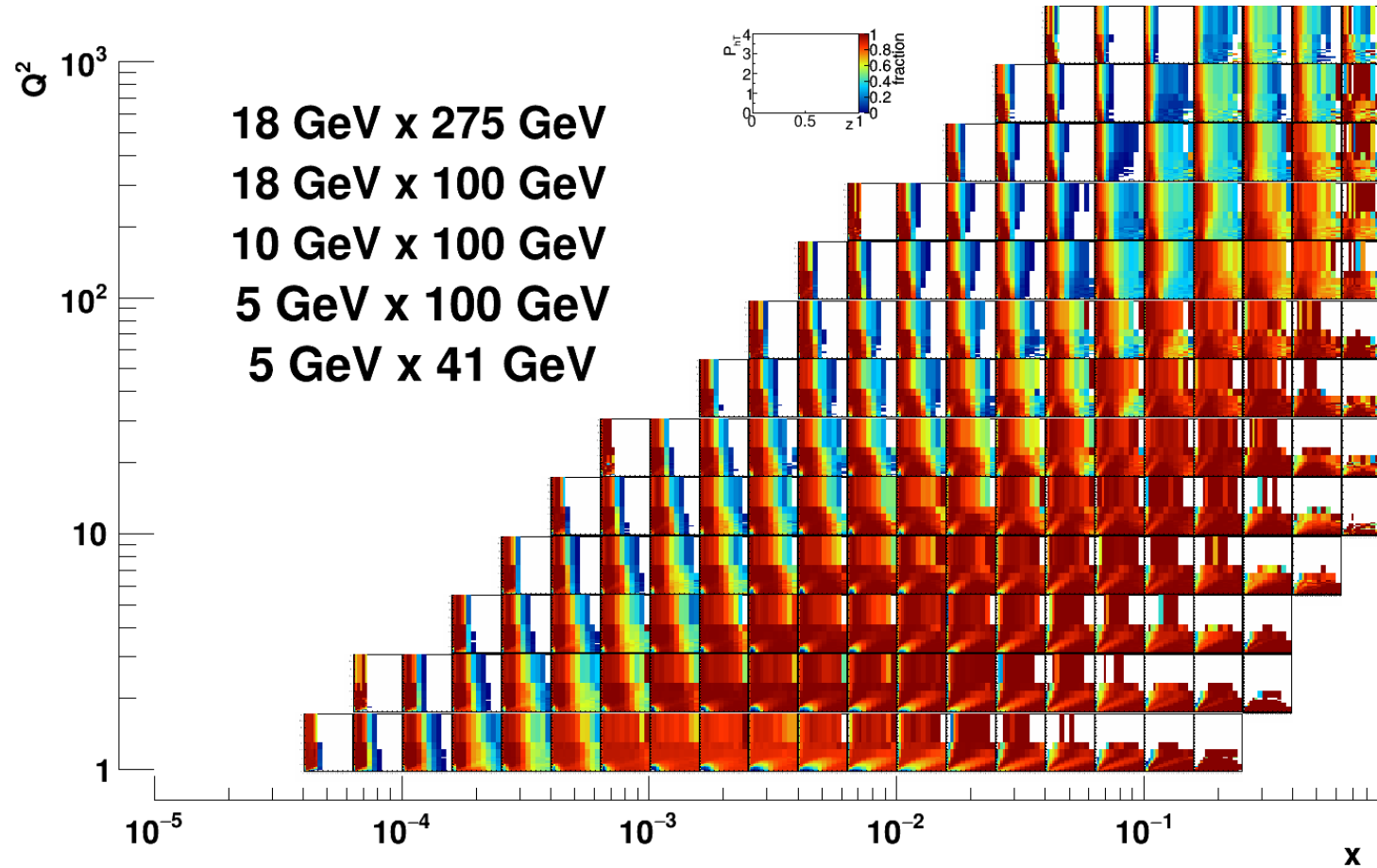
Matrix



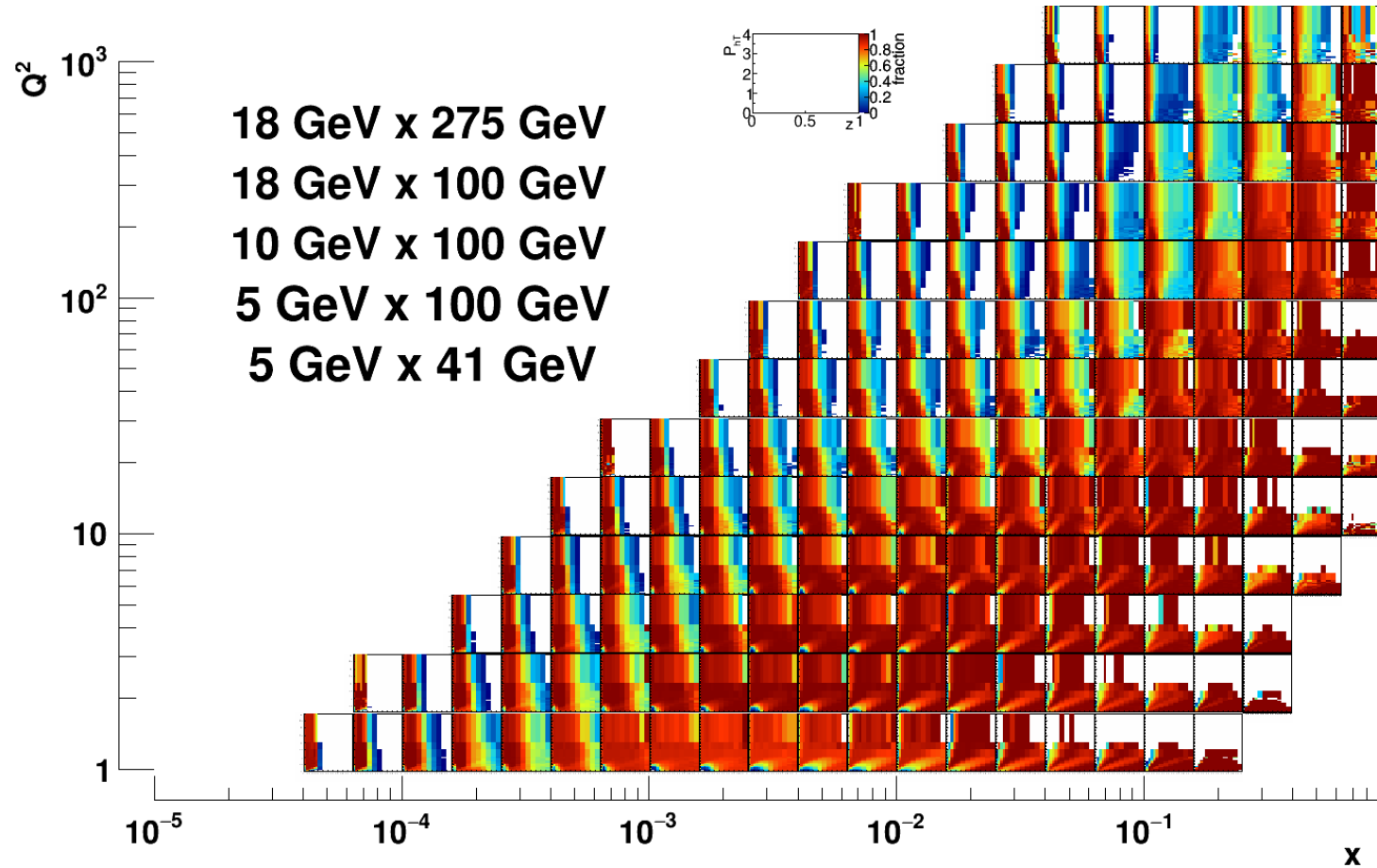
SIDIS



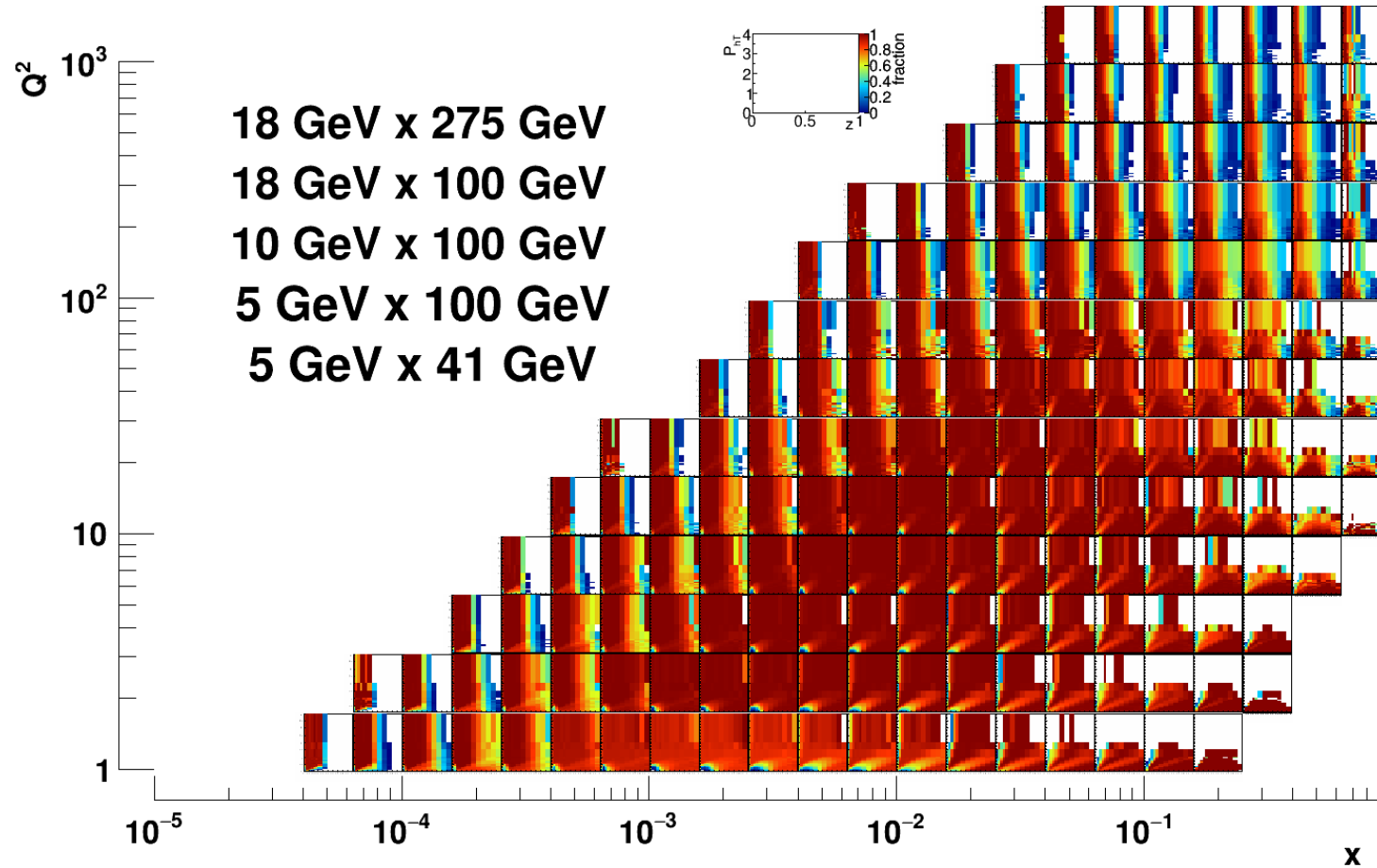
old



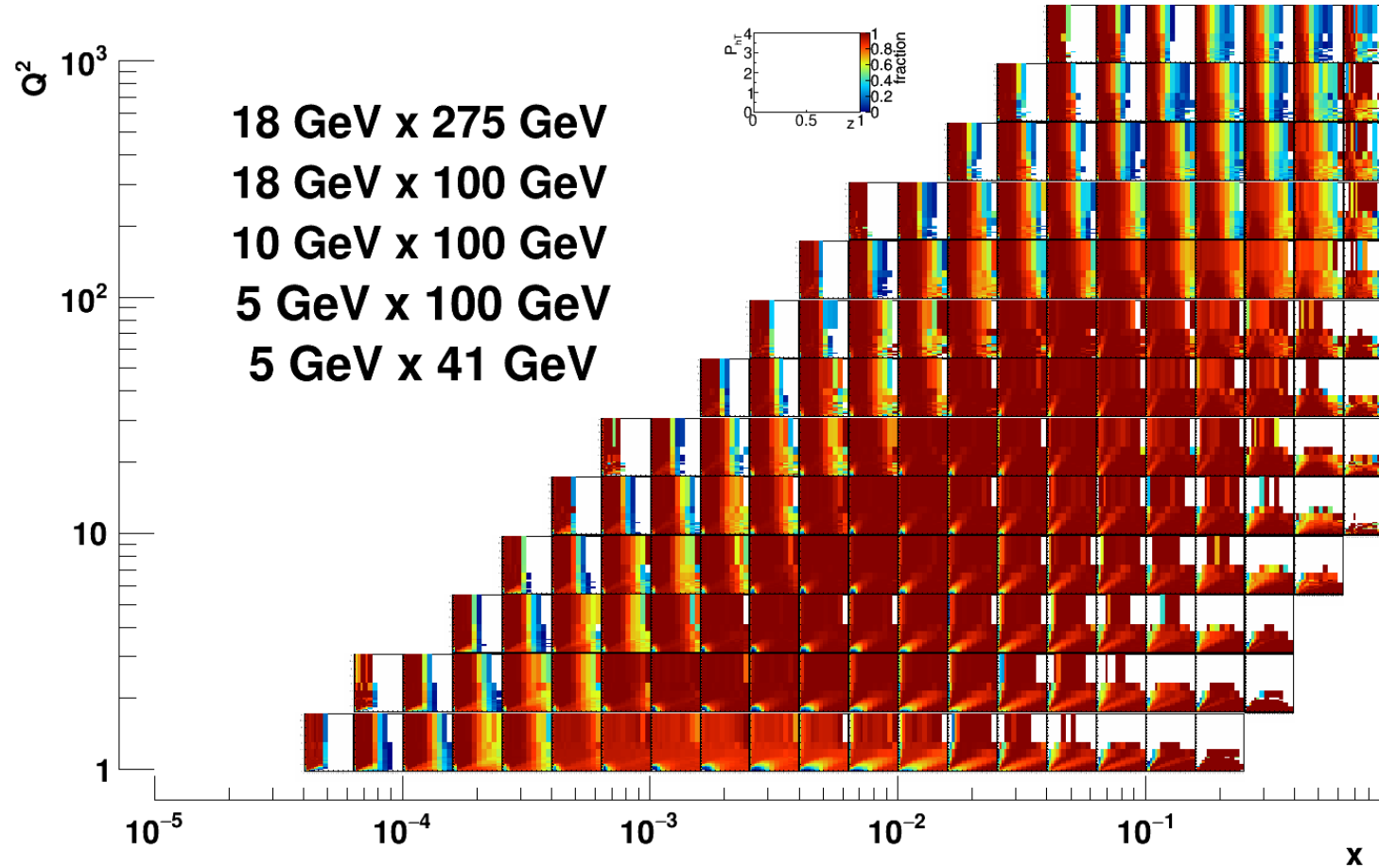
Very high P



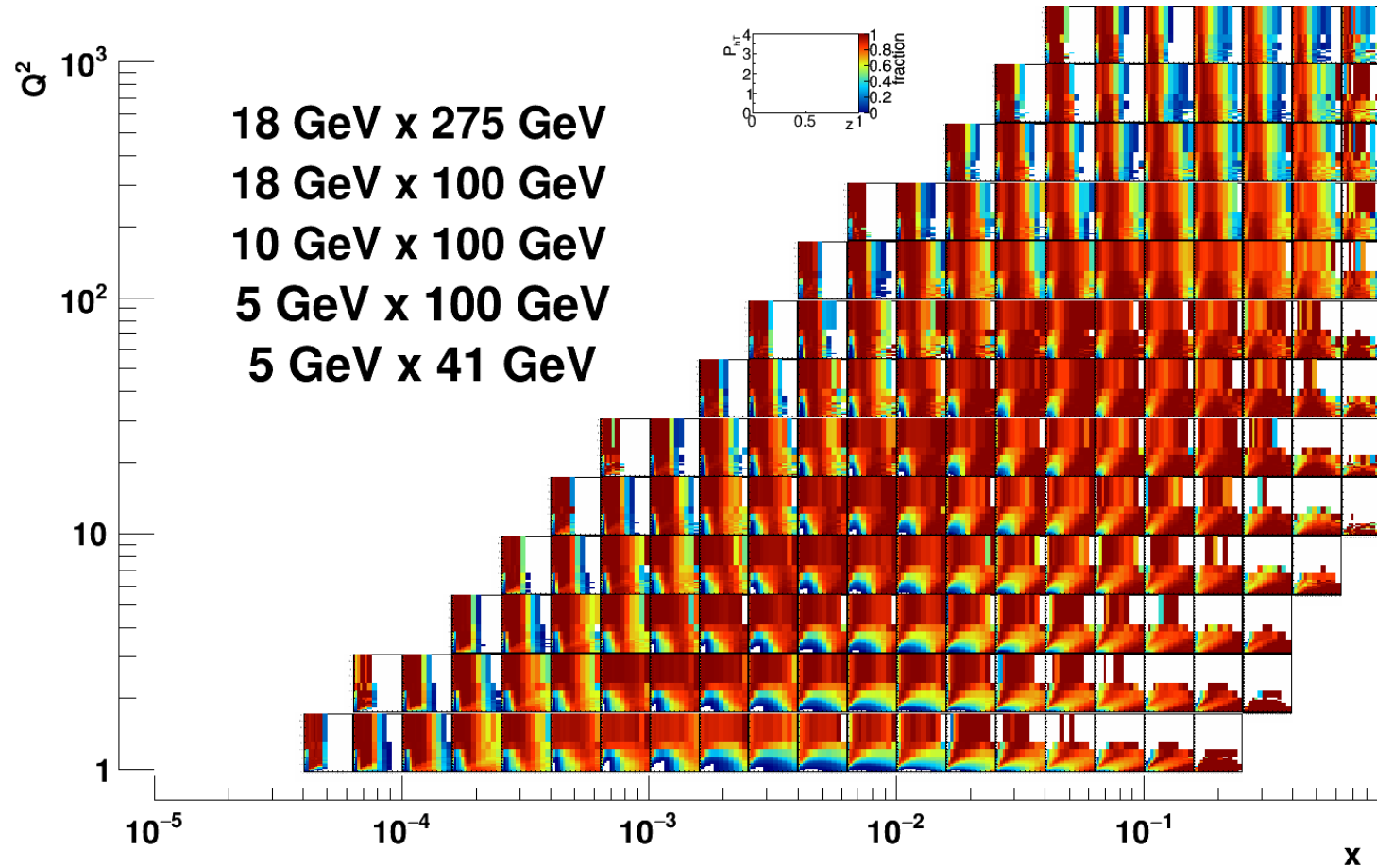
SIDIS request



Anselm



Low p cut



SIDIS group's detector matrix

η	Nomenclature	Resolution	Tracking Allowed X/X0	Si-Vertex	minimum-pT	Electrons Resolution $\sigma E/E$	PID	Photons min E	$\pi/K/p$ p-Range (GeV/c)	Separation	HCAL Resolution on $\sigma E/E$	Muons
-6.9 to -5.8	low-Q2 tagger	$\sigma_{\theta}/\theta < 1.5\%$; $10^{-6} < Q^2 < 10^{-2} \text{ GeV}^2$										
...												
-4.5 to -4.0	Auxiliary Detectors $\downarrow p/A$	Instrumentation to separate charged particles from photons										
-4.0 to -3.5												
-3.5 to -3.0		$\sigma_{p/p} \sim 0.1\% \oplus 0.5\%$										
-3.0 to -2.5	Backward Detector	$\sigma_{p/p} 0.1\% \oplus 0.5\%$		TBD								
-2.5 to -2.0												
-2.0 to -1.5		$\sigma_{p/p} 0.05\% \oplus 0.5\%$										
-1.5 to -1.0												
-1.0 to -0.5												
-0.5 to 0.0	Central Detector	$\sigma_{p/p} \sim 0.05\% \times p + 0.5\%$	$\sim 5\%$ or less X	$\sigma_{xyz} \sim 20 \mu\text{m}$ $d_0(z) \sim d_0(r\Phi) \sim 20/p \text{ TGeV}$ $\mu\text{m} + 5 \mu\text{m}$								
0.0 to 0.5												
0.5 to 1.0												
1.0 to 1.5		$\sigma_{p/p} \sim 0.05\% \times p + 1.0\%$										
1.5 to 2.0	Forward Detectors	0%										
2.0 to 2.5												
2.5 to 3.0		$\sigma_{p/p} \sim 0.1\% \times p + 2.0\%$										
3.0 to 3.5		0%										
3.5 to 4.0												
3.5 to 4.0	Auxiliary Detectors $\uparrow e$	Instrumentation to separate charged particles from photons										
4.0 to 4.5												
...												
4.0 to 4.5	Neutron Detection											
...												
> 6.2	Proton Spectrometer	$\sigma_{\text{intrinsic}}(t)/ t < 1\%$; Acceptance: $0.2 < p_t < 1.2$										

Summary

- SIDIS preferences help at intermediate x , z and Q^2 ranges for all transverse momenta over official detector matrix
- Old setting particularly helpful for larger z , x and Q^2 , but 50 GeV PID acceptance already at rapidities from 2 very unlikely \rightarrow try to push as much as is possible: 20/30/45 GeV
- Very high momentum for π^0 would help at the highest x and z but would require expensive pre-shower
- Conclusion:
 - higher P ranges help – forward ($\eta > 1$) may be even more important as harder to cover by different energies
 - No need to cover more than 8 GeV at central rapidities

MC simulations status

	1 < Q2 < 100		100 < Q2	
ep 18x275	60M	68 pb ⁻¹	4M	1.3 fb ⁻¹
ep 18x100	40M	59 pb ⁻¹	4M	2.3 fb ⁻¹
ep 10x100	40M	69 pb ⁻¹	2M	1.7 fb ⁻¹
ep 5x100	40M	84 pb ⁻¹	1M	1.5 fb ⁻¹
ep 5x41	40M	125 pb ⁻¹	1M	6.2 fb ⁻¹

Part of the data is already copied to shared
EICDATA/YR-SIDIS/ directory