

Radiative corrections

SIDIS PWG meeting
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Radiative events in pythiaeRHIC and Djangoh

- pythiaeRHIC: (final state momentum unbalanced)

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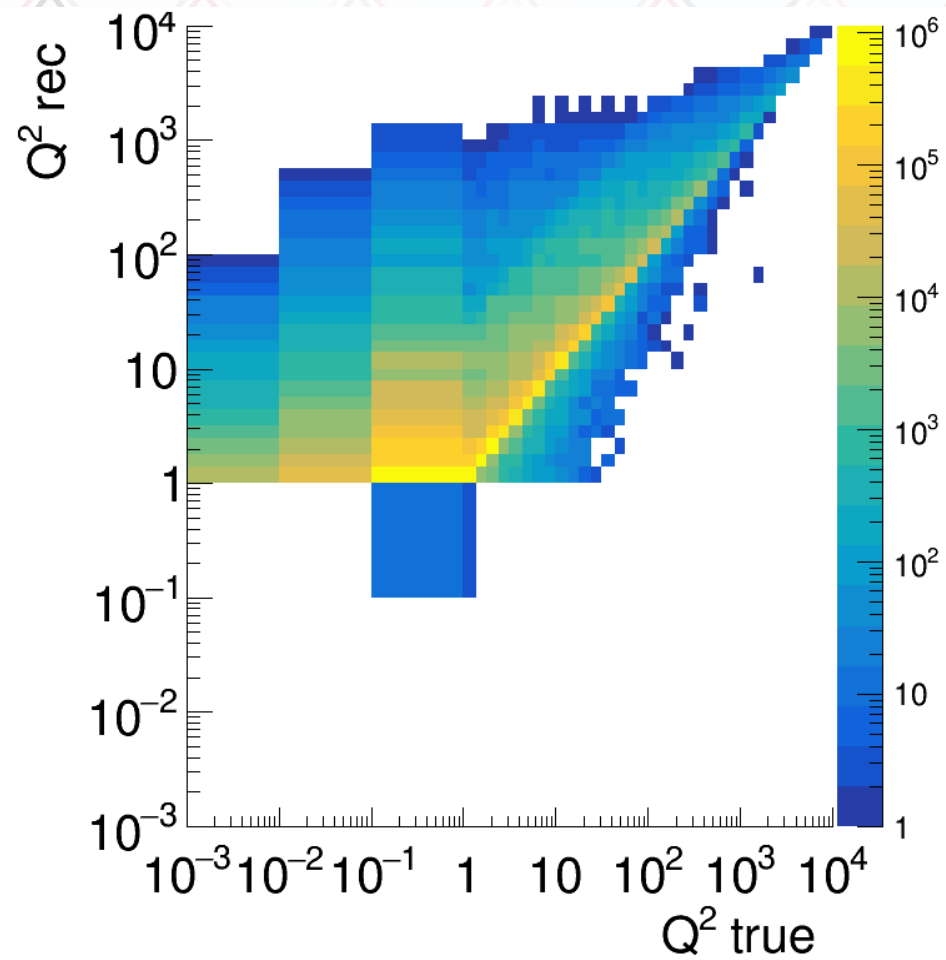
Momentum sum -0.00 -0.01 256.98
photon -0.00 -0.01 -0.02 KS 55 22 55
Momentum sum -0.41 0.15 253.59
photon -0.41 0.15 -3.41 KS 55 22 55
Momentum sum 0.05 -0.14 246.43
photon 0.05 -0.14 -10.57 KS 55 22 55
Momentum sum -0.02 -0.01 257.03
photon -0.02 -0.01 0.03 KS 55 22 55
Momentum sum 0.02 0.00 247.21
photon 0.02 0.00 -9.79 KS 55 22 55
Momentum sum -0.01 0.04 256.82
photon -0.01 0.04 -0.18 KS 55 22 55
    
```

- Djangoh (final state momentum balanced)

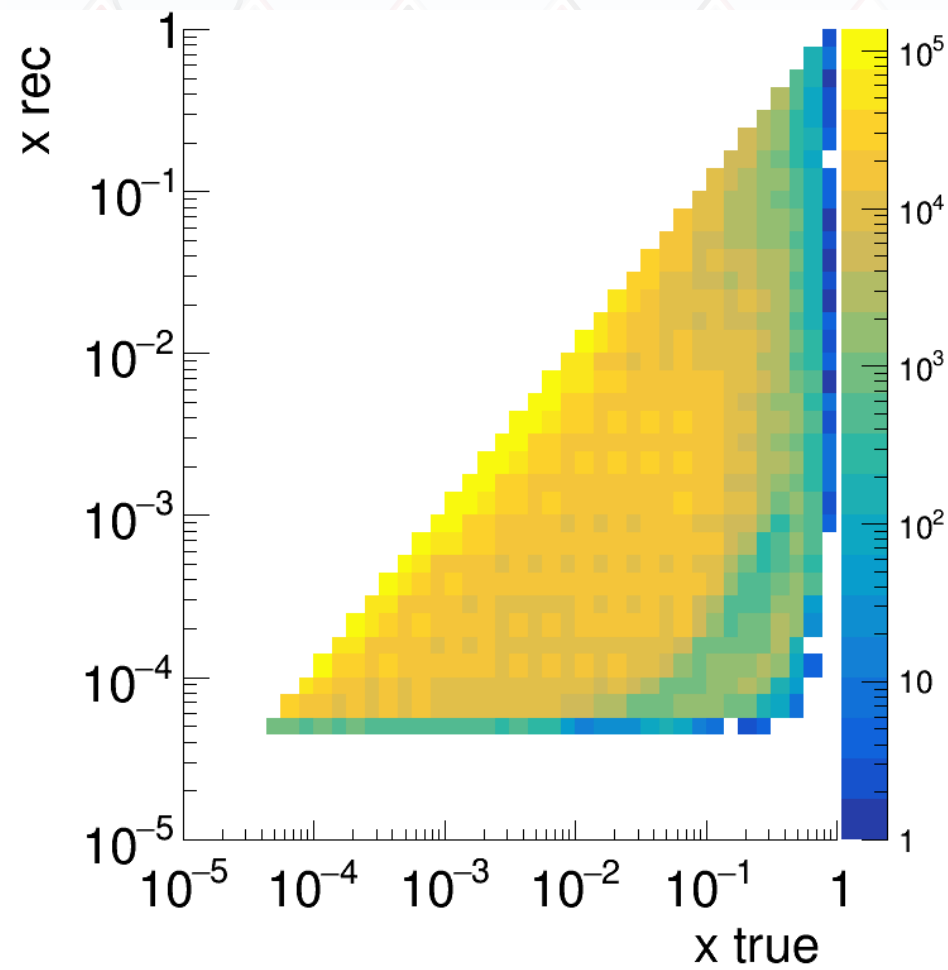
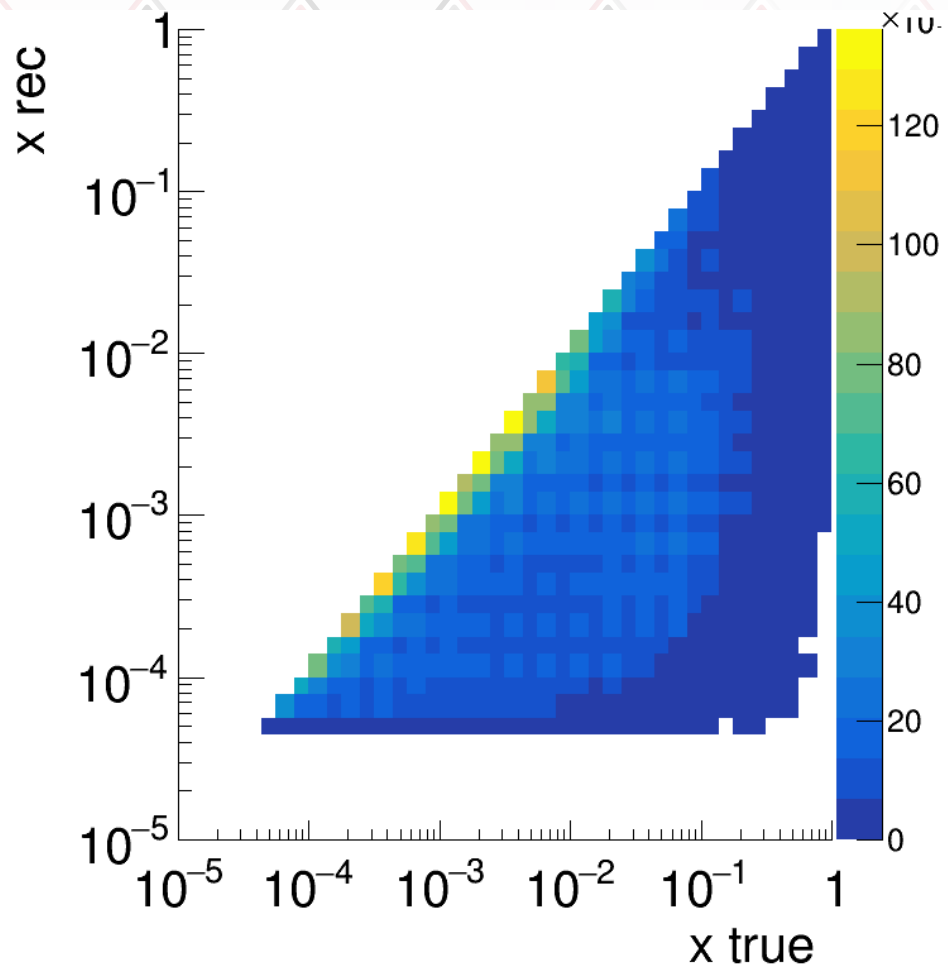
```

Momentum sum -0.00 0.00 257.01
photon 0.00 0.00 -1.03 KS 1 22 1
Momentum sum 0.00 0.00 257.00
photon -0.34 0.16 -3.70 KS 1 22 1
Momentum sum -0.00 -0.00 257.00
photon 0.22 -0.00 -15.44 KS 1 22 1
Momentum sum -0.00 0.00 257.00
photon 0.00 -0.00 -9.22 KS 1 22 1
Momentum sum -0.00 0.00 257.00
photon -0.00 0.00 -1.27 KS 1 22 1
Momentum sum 0.00 -0.00 257.00
photon -0.00 -0.00 -0.28 KS 1 22 1
Momentum sum 0.00 -0.00 257.00
photon 0.00 -0.00 -0.15 KS 1 22 1
    
```

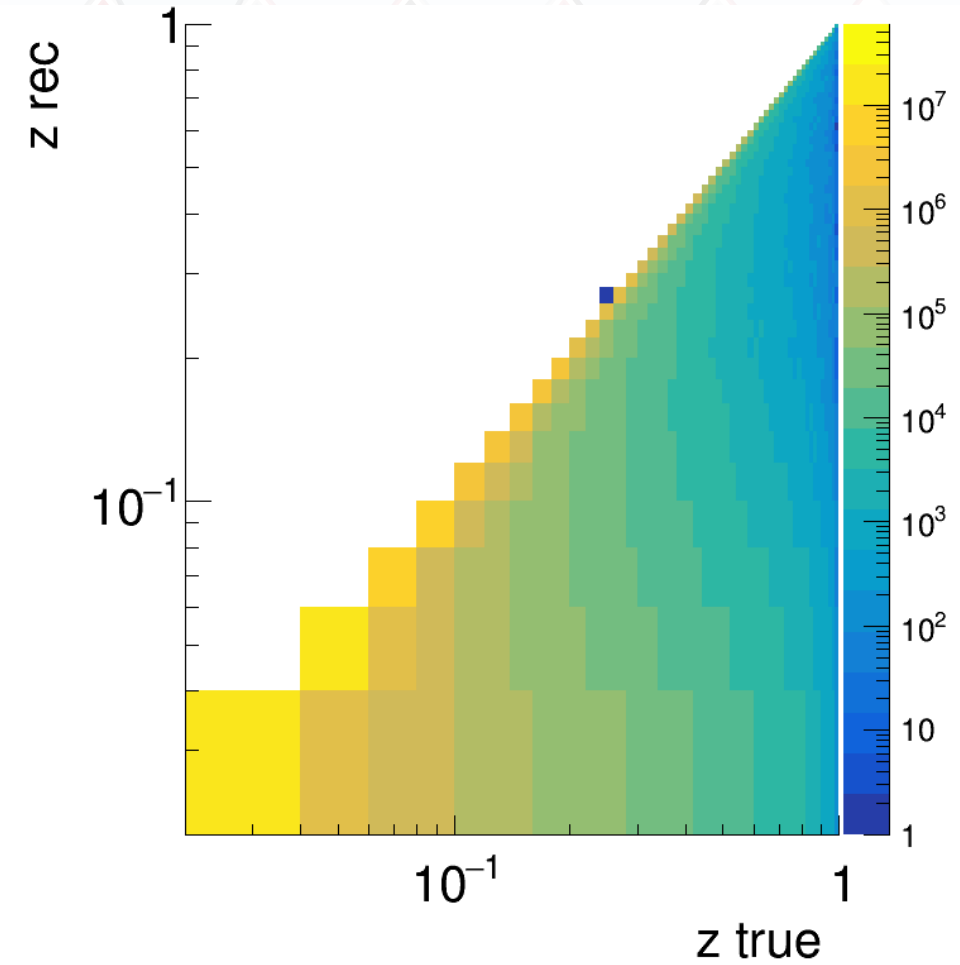
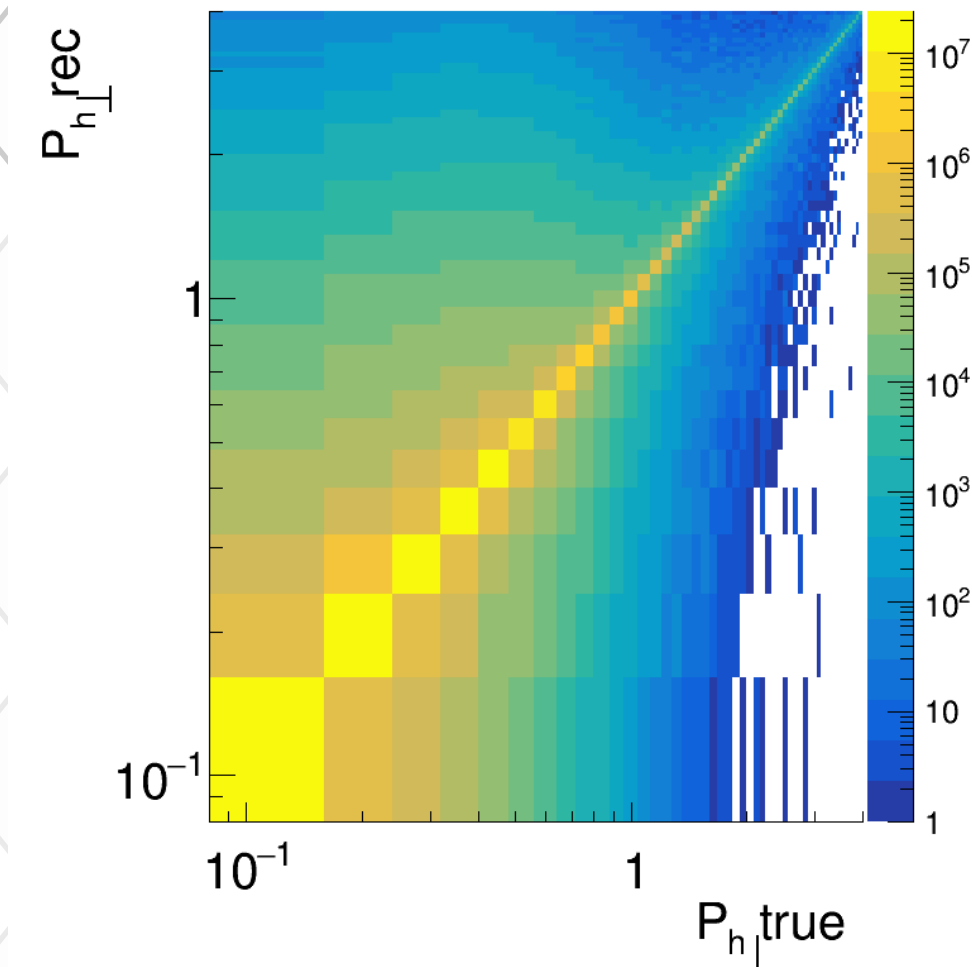
Q² smearing



X smearing



Pion variables (integrated over all DIS kinematics)



Simulation status

- Created more generated files for next set of simulations (pythiaeRHIC, noradcor)
- Also low Q^2 background created ($10^{-9} < Q^2 < 1$) as required by the BG task force
- Some unpol Django with radiative corrections also prepared

Title	Q2 min	Q2 max	#files	# events	xsec [pb]	luminosity [pb-1]
ep-18x275_qbin1	0	1	50	100M	1.47E+08	6.80E-01
ep-18x275_qbin2	1	10	50	100M	8.09E+05	1.24E+02
ep-18x275_qbin3	10	100	40	40M	7.09E+04	5.64E+02
ep-18x275_qbin4	100	1000	100	10M	3.04E+03	3.29E+03
ep-18x275_qbin5	1000	100000	100	5M	5.70E+01	8.78E+04
ep-10x100_qbin1	0	1	50	100M	1.09E+08	9.15E-01
ep-10x100_qbin2	1	10	40	80M	5.39E+05	1.48E+02
ep-10x100_qbin3	10	100	40	40M	3.96E+04	1.01E+03
ep-10x100_qbin4	100	1000	100	10M	1.17E+03	8.59E+03
ep-10x100_qbin5	1000	100000	40	2M	4.29E+00	4.67E+05
ep-5x100_qbin1	0	1	50	100M	9.37E+07	1.07E+00
ep-5x100_qbin2	1	10	40	80M	4.46E+05	1.79E+02
ep-5x100_qbin3	10	100	40	40M	2.91E+04	1.38E+03
ep-5x100_qbin4	100	1000	100	10M	6.48E+02	1.54E+04
ep-5x100_qbin5	1000	100000	40	0.4M	2.09E-01	1.91E+06
ep-5x41_qbin1	0	1	50	100M	7.45E+07	1.34E+00
ep-5x41_qbin2	1	10	40	80M	3.43E+05	2.33E+02
ep-5x41_qbin3	10	100	40	40M	1.94E+04	2.07E+03
ep-5x41_qbin4	100	1000	100	10M	2.22E+02	4.51E+04

Summary

- Radiative corrections seem wrong in pythiaRHIC, work as expected in Djangoh
- Problem seems to be present for quite a while already
- For the time being study radiative corrections with Djangoh instead
- Increased statistics available for simulations, including low Q^2 background