F3C-uR models further analysis

Disha Bhatia, Indian Association for the Cultivation of Science

Inclusive k-factor:

1) **xx process**

   generate p p > dm dm /excluded [QCD] → NLO

   generate p p > dm dm /excluded → LO

   Cuts: ptj > 100 GeV, |etaj| < 5

   Pdf: 260000

2) xy process

   generate p p > dm yy /excluded [QCD] → NLO

   generate p p > dm yy/excluded   → LO Cuts: ptj > 30 GeV, |etaj < 5|

3) yy QCD:

    generate p p > yy yy /excluded [QCD] → NLO

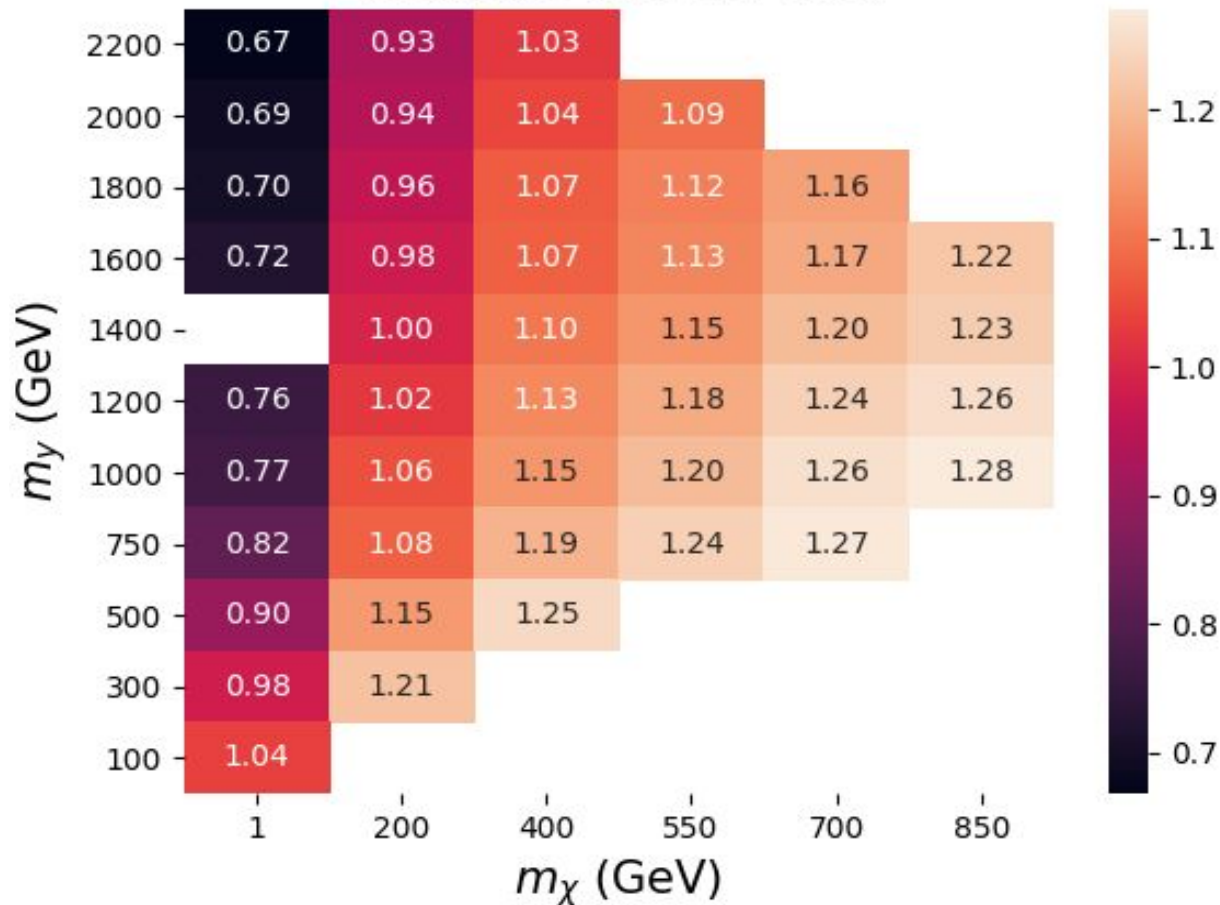   generate p p > yy yy /excluded   → LO

    Cuts: ptj > 30 GeV

4) yy-t-channel

    generate p p > yy yy /excluded DMT=2 QCD=0 QED=0 [QCD] → NLO

    generate p p > yy yy/excluded DMT=2 QCD=0 QED=0 → LO
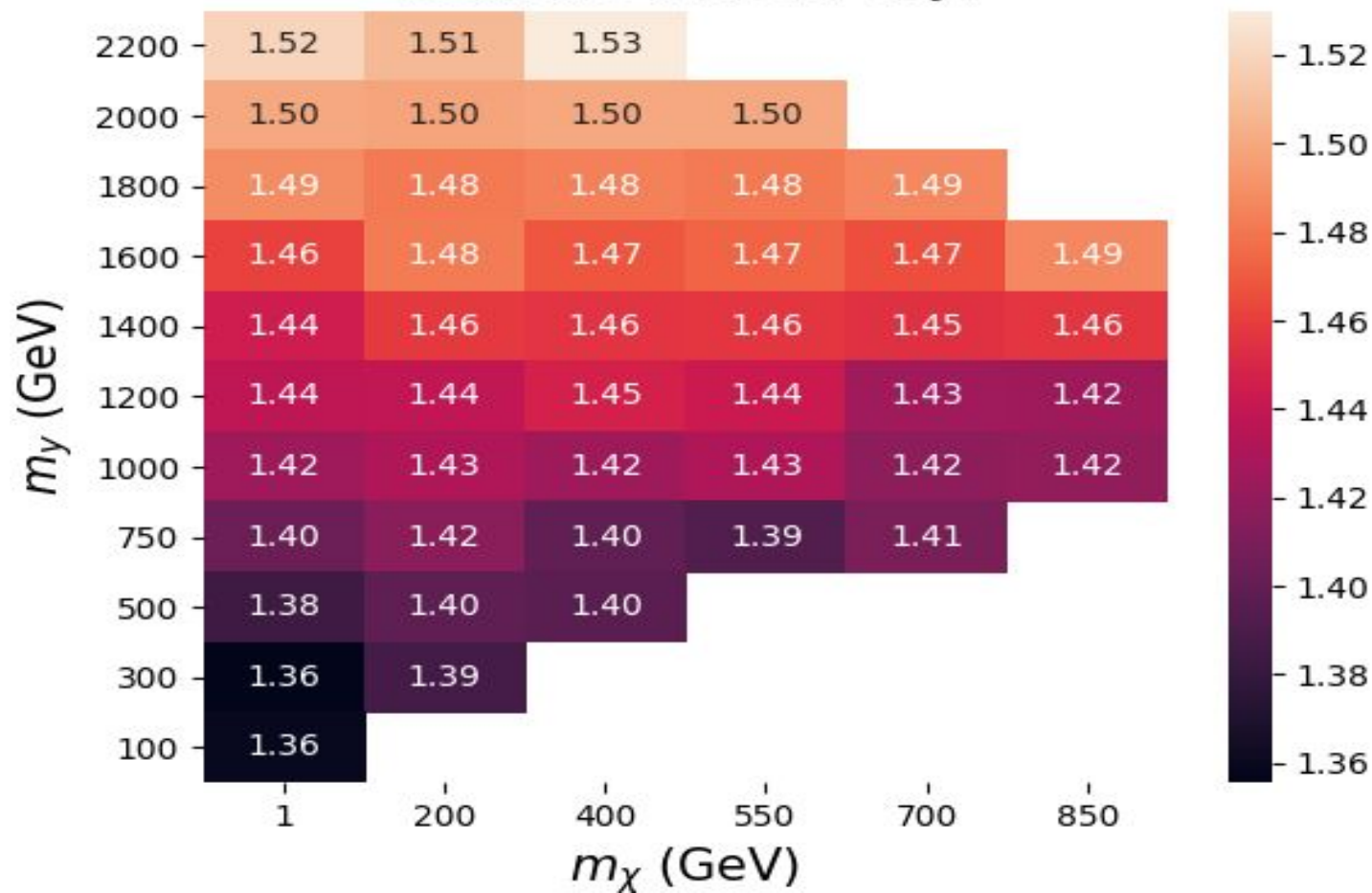
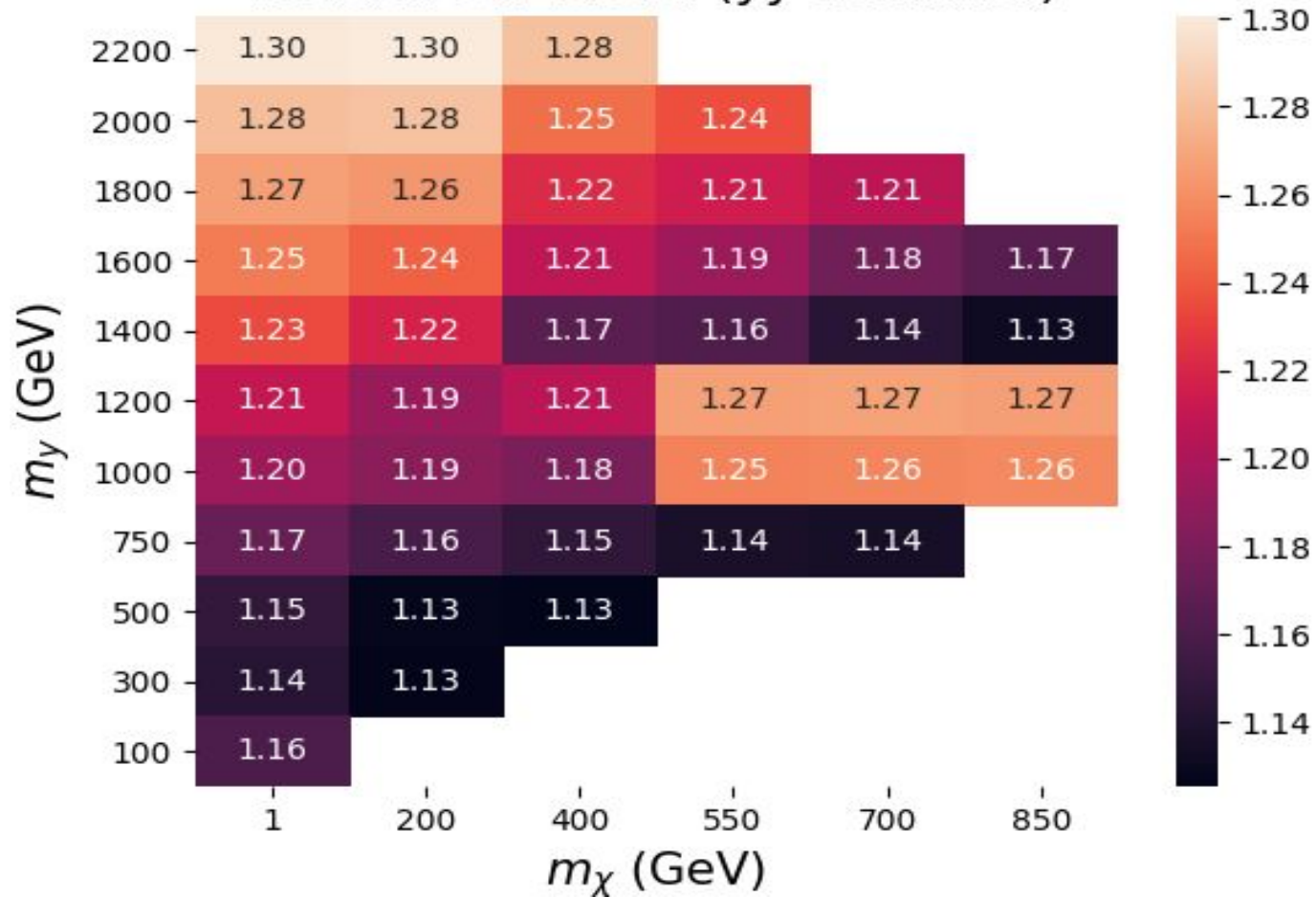**The mediator is not decayed for evaluating the inclusive k-factor**

inclusive k-factor (xx)

K-factor sensitive to both mediator and dark matter particle mass
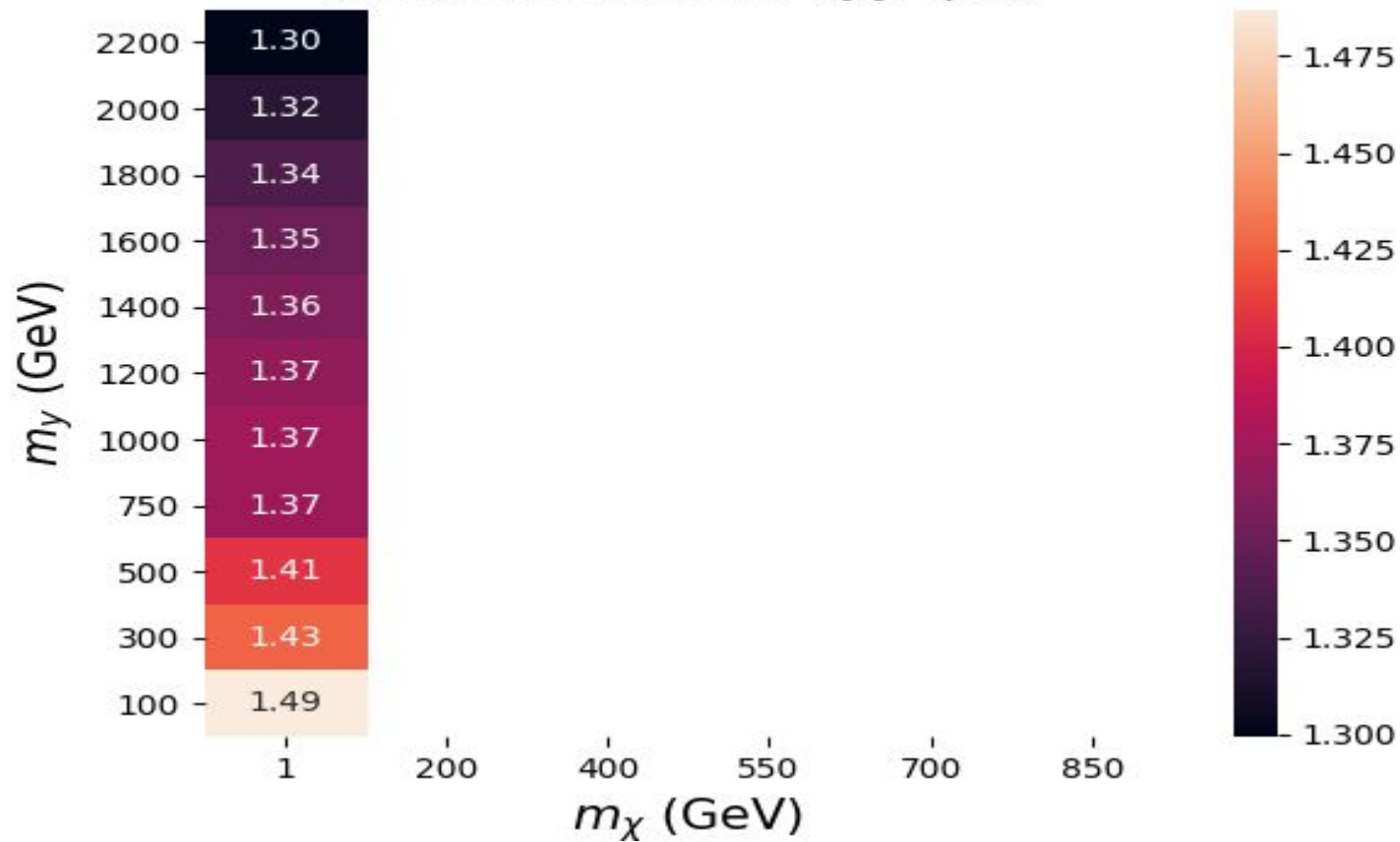
inclusive k-factor (xy)

m_y (GeV) \ m_χ (GeV)	1	200	400	550	700	850
2200	1.52	1.51	1.53			
2000	1.50	1.50	1.50	1.50		
1800	1.49	1.48	1.48	1.48	1.49	
1600	1.46	1.48	1.47	1.47	1.47	1.49
1400	1.44	1.46	1.46	1.46	1.45	1.46
1200	1.44	1.44	1.45	1.44	1.43	1.42
1000	1.42	1.43	1.42	1.43	1.42	1.42
750	1.40	1.42	1.40	1.39	1.41	
500	1.38	1.40	1.40			
300	1.36	1.39				
100	1.36					

Sensitivity largely on the mediator

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inclusive k-factor (yy-tchannel)

m_y (GeV) \ m_χ (GeV)	1	200	400	550	700	850
2200	1.30	1.30	1.28			
2000	1.28	1.28	1.25	1.24		
1800	1.27	1.26	1.22	1.21	1.21	
1600	1.25	1.24	1.21	1.19	1.18	1.17
1400	1.23	1.22	1.17	1.16	1.14	1.13
1200	1.21	1.19	1.21	1.27	1.27	1.27
1000	1.20	1.19	1.18	1.25	1.26	1.26
750	1.17	1.16	1.15	1.14	1.14	
500	1.15	1.13	1.13			
300	1.14	1.13				
100	1.16					

inclusive k-factor (yy-qcd)

Exclusive k-factor: Leading order commands

1) xx:

    generate p p > dm dm /excluded ; add process p p > dm dm j /excluded $yy

2) xy:

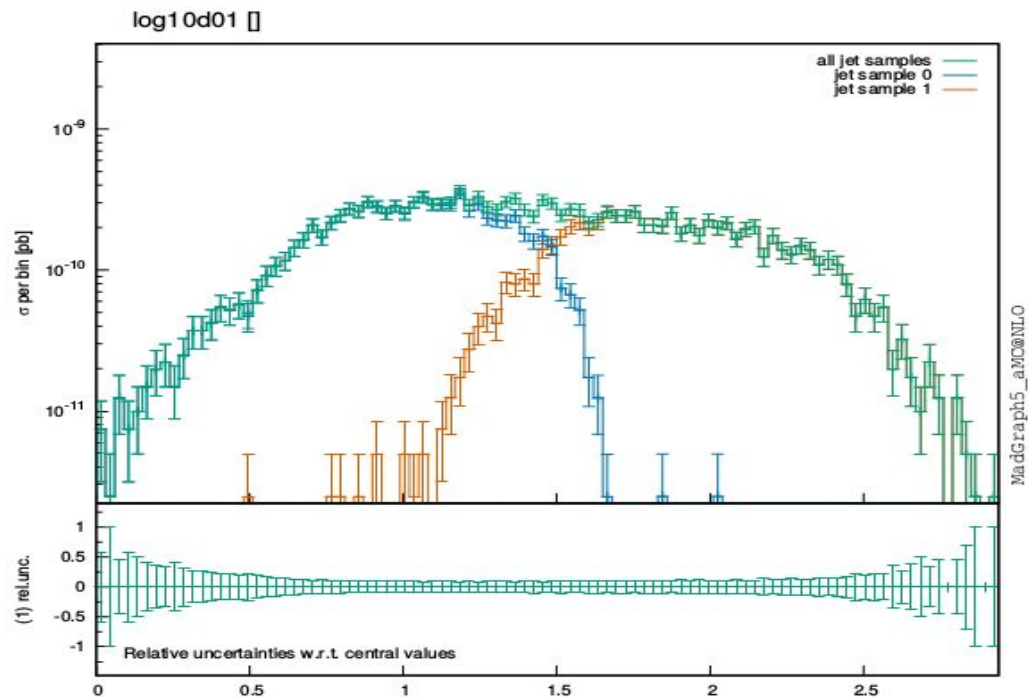   generate p p > yy dm /excluded ; add process p p > yy dm j /excluded $yy

3) yy:

    generate p p > yy yy /exclued [for t-channel: we use in addition DMT=2 QCD=0 QED=0]

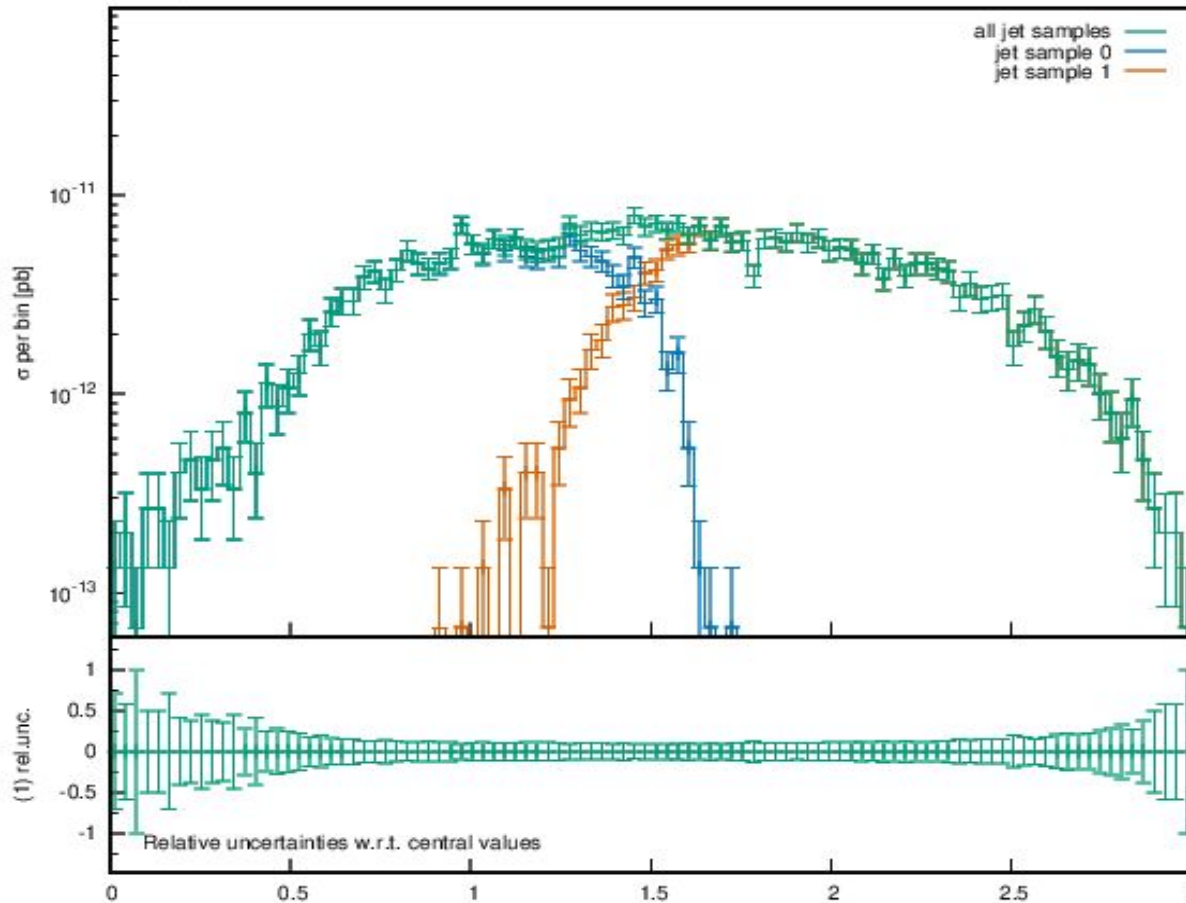# Merging plots (xx -mode):

mx = 200 GeV

mY = 500 GeV

log10d01 []

mx= 550 GeV
My = 1000 Gev

Differential k-factor for mx= 200 GeV, my=550 GeV