



Polarisation study

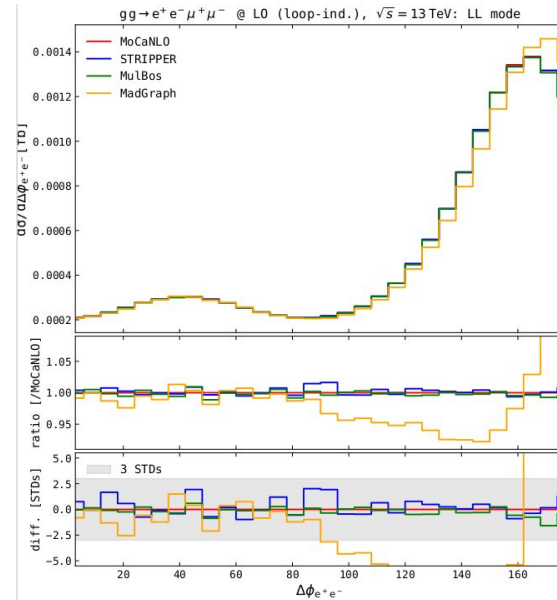
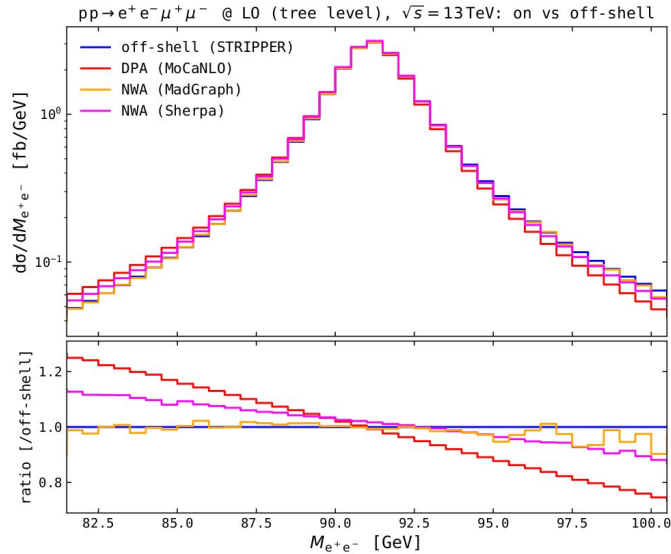
January 2025

31.01.2025

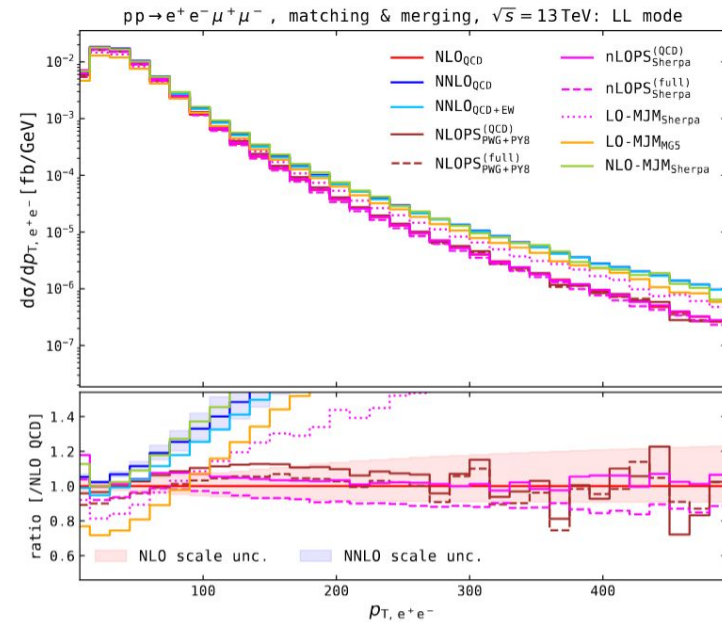
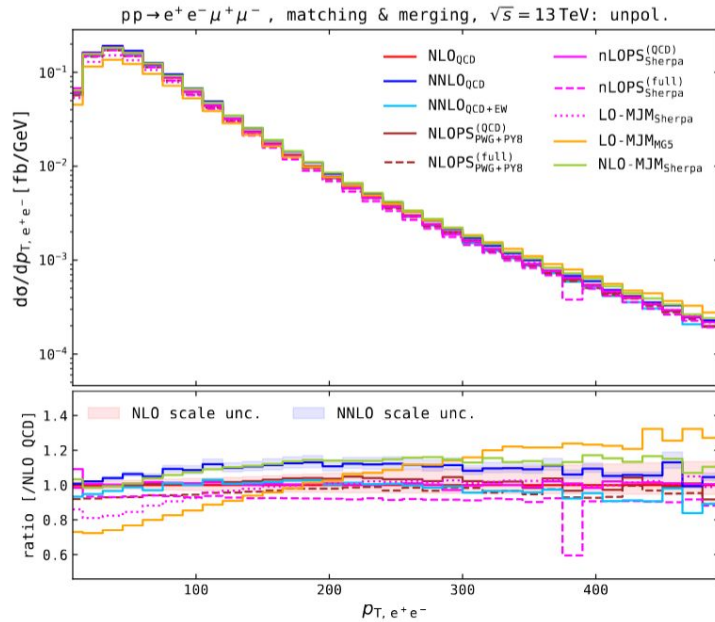
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Pending questions

- **Sherpa**: shift in NWA calculations (also at LO, Mll shape), maybe wrong input settings?
- **MG5 loop-induced gg**: polarised results (LL) still off, gauge invariance under control?



Matched & merged results



→ all results now available: interesting results (nLO merging reproduces NNLO pretty well)

Polarisation fractions

	LL	LT	TL	TT
LO ($q\bar{q}$)	$5.85^{+0.07}_{-0.08}$	$11.86^{+0.09}_{-0.11}$	$11.89^{+0.09}_{-0.11}$	$69.27^{+0.30}_{-0.26}$
LO (gg)	$5.39^{+0.02}_{-0.02}$	$2.12^{+0.01}_{-0.01}$	$2.10^{+0.01}_{-0.01}$	$90.48^{+0.03}_{-0.03}$
NLO _{EW}	$5.89^{+0.06}_{-0.08}$	$11.97^{+0.09}_{-0.11}$	$12.01^{+0.09}_{-0.11}$	$68.98^{+0.29}_{-0.25}$
NLO _{QCD}	$5.87^{+0.03}_{-0.05}$	$12.74^{+0.07}_{-0.06}$	$12.69^{+0.07}_{-0.06}$	$67.35^{+0.14}_{-0.16}$
NNLO _{QCD}	$6.07^{+0.05}_{-0.04}$	$13.11^{+0.09}_{-0.08}$	$13.04^{+0.08}_{-0.07}$	$66.20^{+0.19}_{-0.24}$
NNLO _{QCD} ^{EW}	$6.12^{+0.06}_{-0.04}$	$13.29^{+0.09}_{-0.08}$	$13.21^{+0.08}_{-0.07}$	$65.75^{+0.20}_{-0.25}$
NLOPS _{QCD}	$5.88^{+0.03}_{-0.04}$	$12.76^{+0.08}_{-0.06}$	$12.71^{+0.07}_{-0.06}$	$67.30^{+0.13}_{-0.15}$
nLOPS _{QCD}	$6.02^{+0.05}_{-0.08}$	$13.04^{+0.04}_{-0.09}$	$12.97^{+0.04}_{-0.09}$	$66.61^{+0.14}_{-0.47}$
NLOPS _{had}	$5.86^{+0.03}_{-0.04}$	$12.74^{+0.08}_{-0.06}$	$12.69^{+0.07}_{-0.06}$	$67.38^{+0.13}_{-0.15}$
nLOPS _{had}	$5.98^{+0.03}_{-0.07}$	$12.99^{+0.02}_{-0.09}$	$12.96^{+0.02}_{-0.09}$	$66.70^{+0.22}_{-0.46}$
LO-MJM ^(MG5)	$5.79^{+0.08}_{-0.09}$	$12.91^{+0.06}_{-0.05}$	$12.84^{+0.06}_{-0.06}$	$66.81^{+0.24}_{-0.22}$
LO-MJM ^(Sher)	$5.91^{+0.01}_{-0.10}$	$12.84^{+0.13}_{-0.23}$	$12.79^{+0.12}_{-0.23}$	$67.14^{+1.08}_{-0.98}$
nLO-MJM ^(Sher)	$6.14^{+0.12}_{-0.11}$	$13.35^{+0.47}_{-0.32}$	$13.23^{+0.32}_{-0.28}$	$65.85^{+1.11}_{-0.96}$

→ all results now available: polarisation fractions dependence on modeling accuracy

Planning

Now

- ATLAS input (PubNote): Xingyu
- Draft status: Rene

Next steps:

- solve pending issues: asap
- ATLAS results: by mid February (?)
- complete draft: by 28 Feb
- submit to arXiv: by 21 Mar

Next meeting: first week of March, after draft is complete