

13000 GeV pp

Top (t-channel)

 $p_T^l$  (CMS single top) $d\sigma_{t+\bar{t}}/dp_T$  (pb/GeV)

1

 $10^{-1}$  $10^{-2}$  $10^{-3}$ 

CMS



Pythia 8.180 default



Pythia 8.180 default-CD



Pythia 8.180 default-MBR

CMS\_2019\_I1744604

Rivet 3.1.10,  $\geq 300k$  events

mcplots.cern.ch [arXiv:1306.3436]

Ratio to CMS

2

1

0.5

2

1

0.5

Particle-level lepton  $p_T$  (GeV)

50

100

150

200