W(eekly) O(ffline) M(eeting)

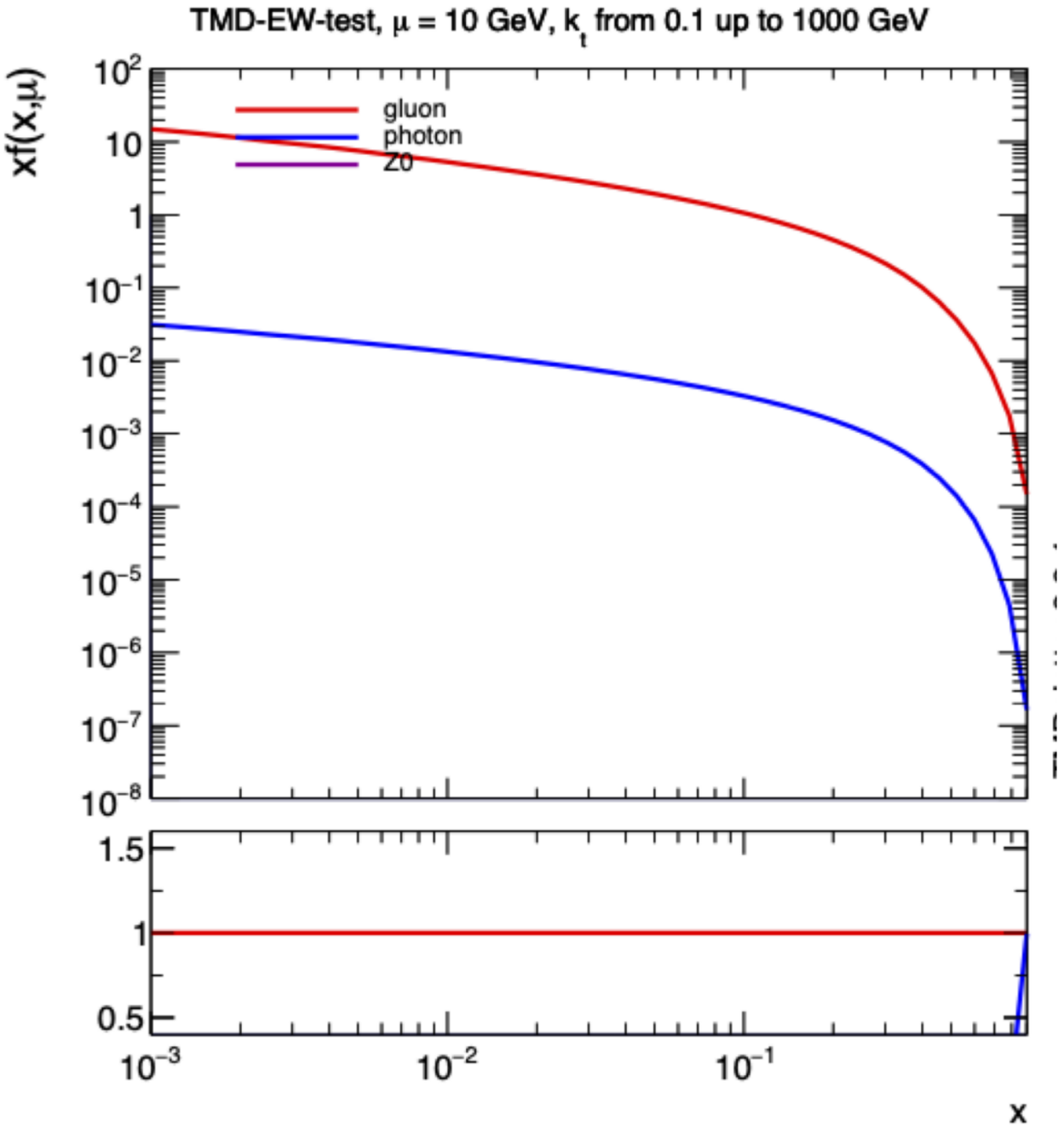
Electroweak TMDs

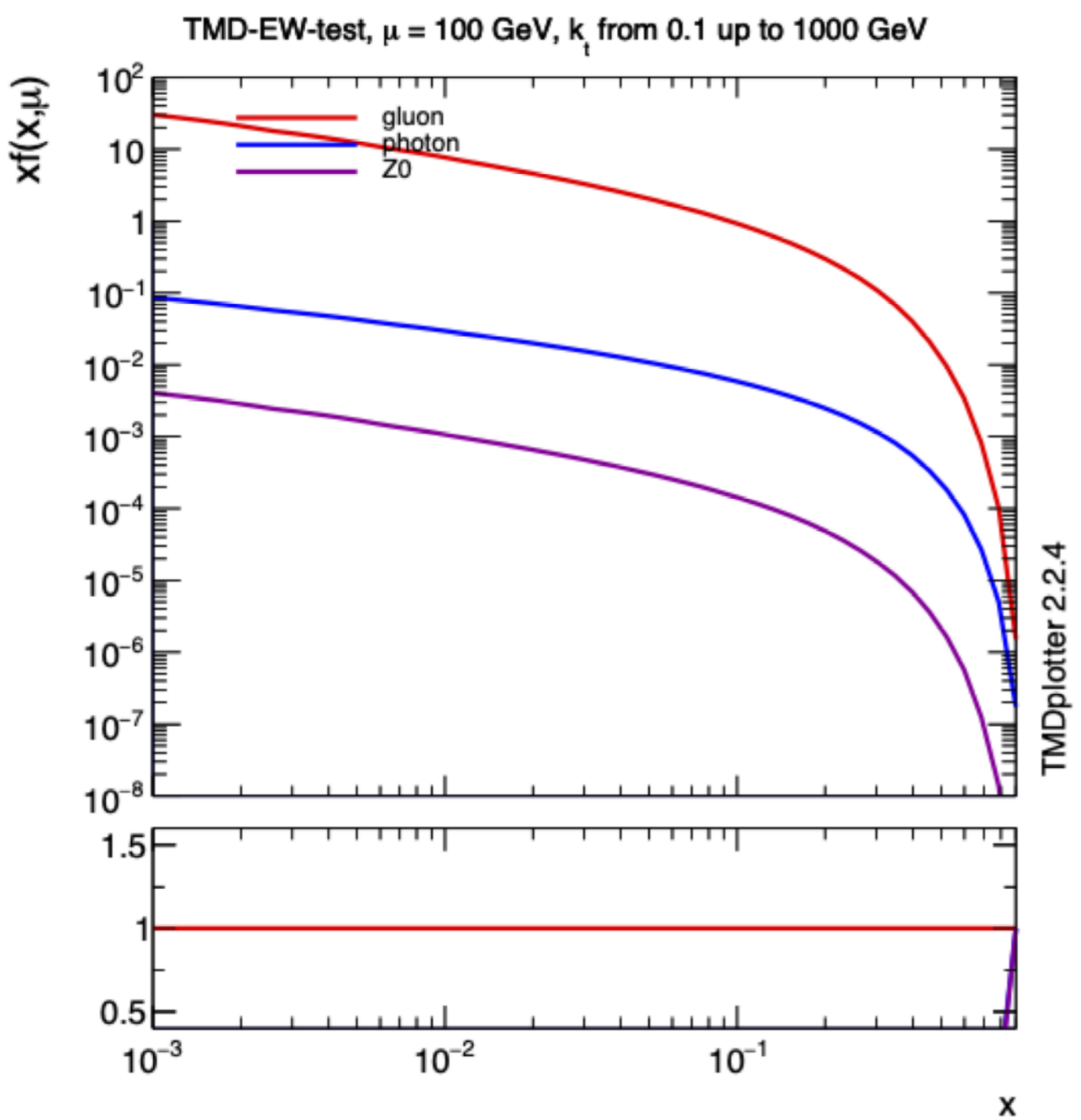
- Already existing: photon TMDs and PDFs from PB approach (Jung, H., Monfared, S. T., and Wening, T. Determination of collinear and TMD photon densities using the Parton Branching method, Physics Letters B, 817(2021), 136299, arXiv2102.01494
- Extend this approach to Z0,W+,W- bosons
  - no intrinsic distribution, all is generated perturbatively.
- Splitting functions: as for photon
- Coupling:

$$\begin{aligned} \text{for } \mathrm{W}^{\pm}\ \alpha \quad &\rightarrow \quad \frac{1}{8}\frac{\alpha}{\sin^2\theta_W} \\ \text{for } \mathrm{Z}_0\ \alpha \quad &\rightarrow \quad \frac{1}{4}\frac{\alpha}{\sin\theta_W\cos\theta_W} \end{aligned} \tag{2}$$

Electroweak PDFs

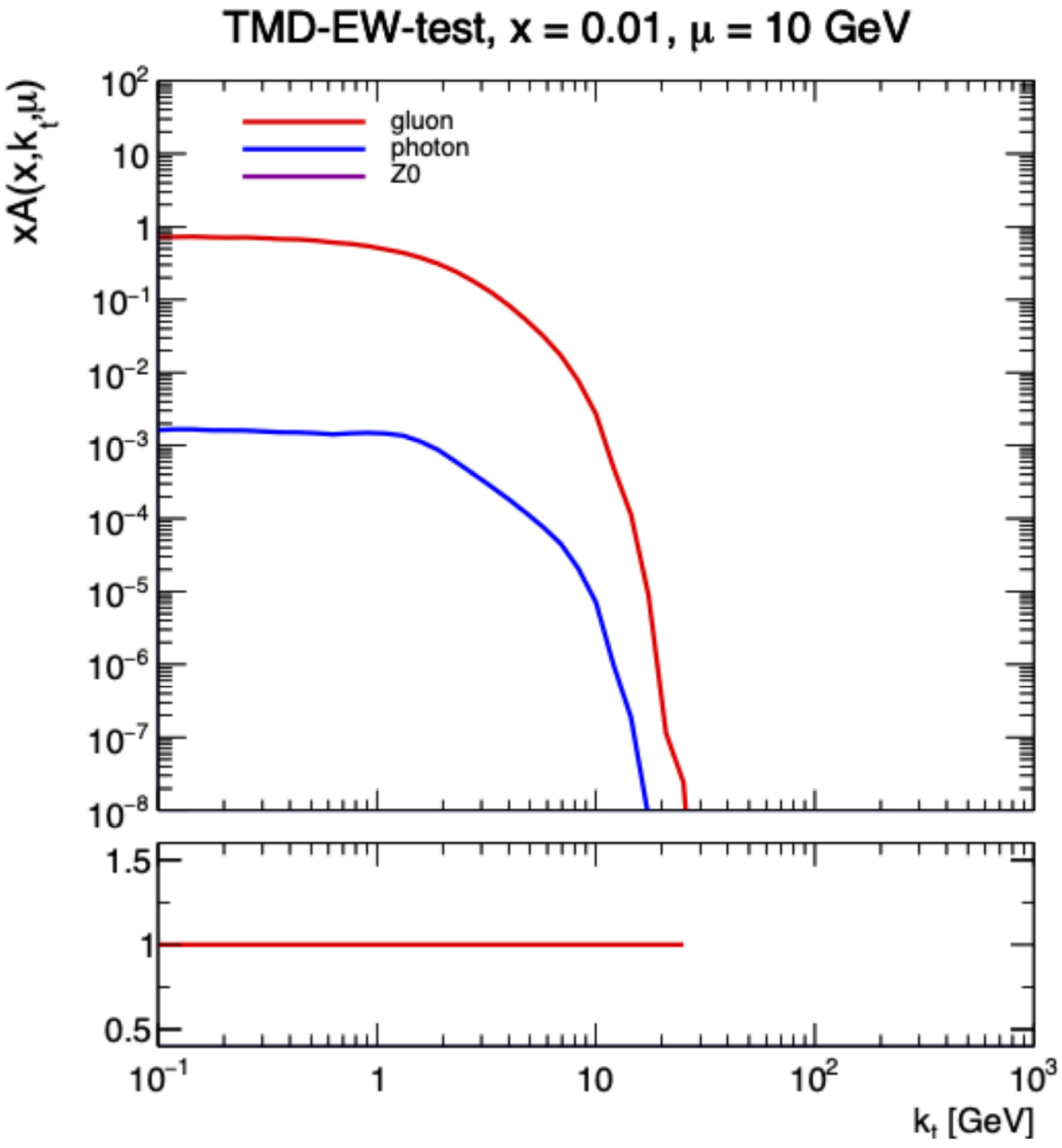
- Integrated PDFs from PB set2

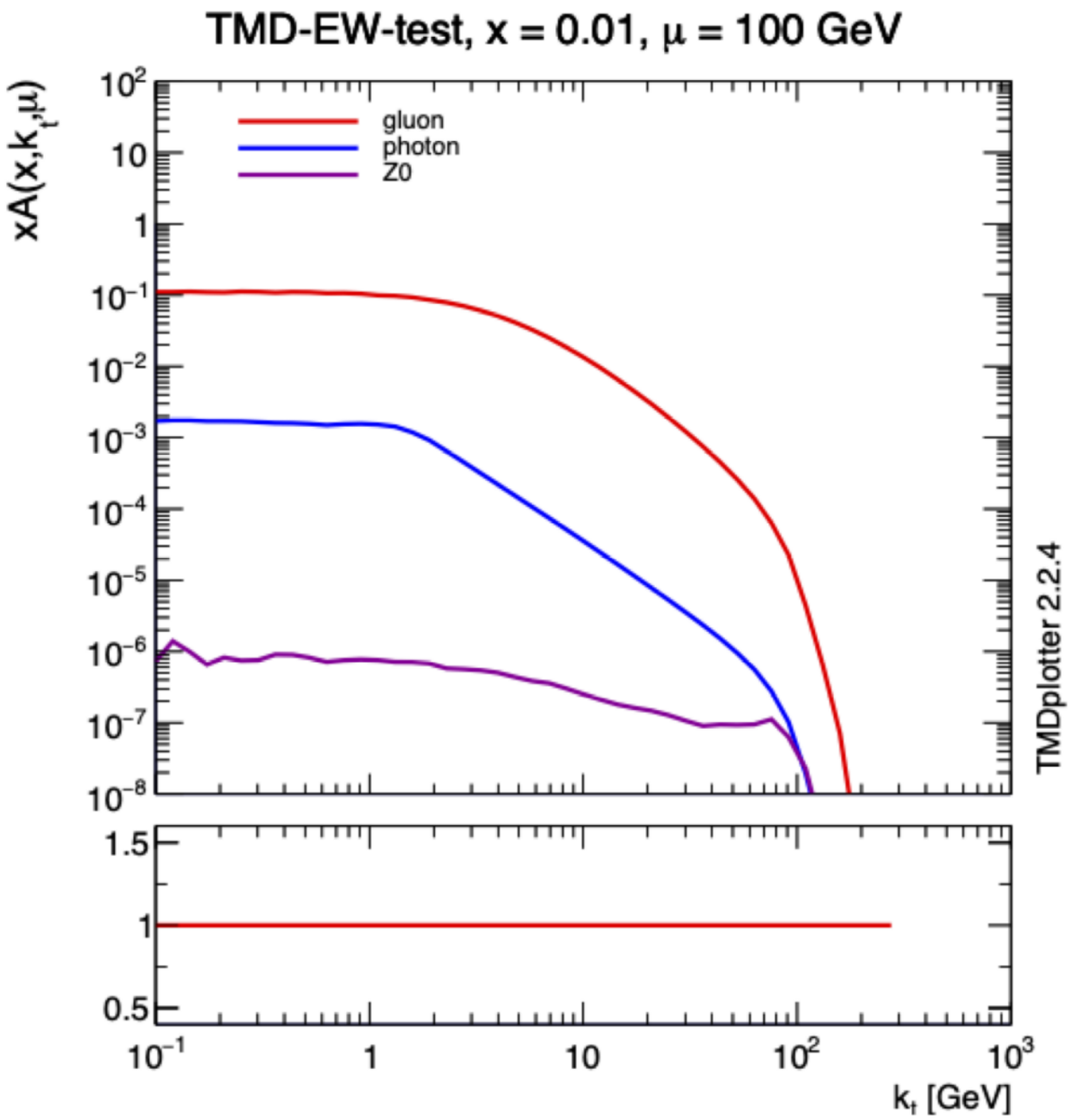




Electroweak TMDs

- Integrated TMDs from PB set2





Electroweak TMDs

- With TMDs we can start calculating x-section for $W^+W^- \to Z_0$
  - need also x-check with calculation of full electroweak ME (from Madgraph?)

Appendix