

Truth particle definition: a PDF-fitter point of view

The NNPDF collaboration:

Jose' I. Latorre (Barcelona)

Maria Ubiali (Cambridge)

Valerio Bertone (CERN)

Alberto Guffanti (Copenhagen)

Richard D. Ball, Christopher Deans, Luigi Del Debbio (Edinburgh)

Stefano Carrazza, Stefano Forte (Milan)

Nathan Hartland, L. Rottoli, Juan Rojo (Oxford)

- Standard PDF fits are based on **fixed order** perturbative calculations at hadron level.

We need bin-by-bin correction factors from truth level (parton level?) to particle level.

Q: Is the parton level defined in hadronization correction the same as the parton level in fixed order calculations?

- Work in progress on hadron-level fits including Parton Shower corrections. Use **aMCfast**, fast interface between aMCatNLO calculations NLO+PS and PDF fits. **Bertone et al. JHEP 1408 (2014) 166**

Any definition of truth level that can be implemented in an analysis of a NLO MC event generator would work for a PDF fit able to include NLO+PS observables

- For processes with large truth to particle level corrections, it would be useful to have a definition of truth particle that could be applied both at the **detector level** and at the **Monte Carlo** simulation level
- Regarding **QED final state radiation** corrections, for us it is better to have measurements corrected for this. Tricky to implement them in theory used in PDF fits.