

## PDFs

- (0) **purposes and goals:** learn how PDFs are relevant in your analysis, e.g.:
- what are different PDFs and their uncertainties and how to use them?
  - which processes/observables are sensitive to PDFs, how to probe sensitivity?
  - which tools related to PDFs are on the market?
  - how your measurement can be used to improve PDFs?
- (1) **team:** Katarzyna, Oleksii, Sasha, Vlad, Volodymyr
- (2) **sketch of exercise:**
- **short** (*how to use PDFs*):
    - learn about tools which give access to PDFs: LHAPDF, xFitter, APFEL
    - use these tools to plot PDFs
    - learn about connection between PDFs and observables:
      - learn about techniques for fast convolution with PDFs: fastNLO, ApplGrid
    - calculate predictions using PDFs
    - benchmark different PDFs, their uncertainties and impact on predictions
  - **long** (*how to improve PDFs*):
    - learn how data can be used to constrain PDFs: profiling, reweighting, fit
      - example of impact of CMS data on existing PDFs via profiling/reweighting
    - learn how PDFs are determined
      - example: HERAPDF2.0 fit using xFitter (certain aspects)
      - add CMS measurements into this fit
- (3) **what needs to be done, timescale for implementation, documentation and testing:** to be discussed within the team
- (4) **special technical requirements:** install and test LHAPDF, xFitter, APFEL (most likely will go straightforward)
- (5) **list relevant short-exercises (only applies for long-exercises):** none