

Status and Updates of the Bayesian reweighting in HERAFitter



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Reminder: NNPDF reweighting

... as implemented technically in HeraFitter

1) `src/reweighting.f`

- define/read-in inputs from steering, create directories
- call `CreateRandomPDFs` (NNPDF package, see 2))
- read in random PDFs, calculate Chi2 fit to theory
(to do: be able to use chi2 theory-data from input files)
- call to `Writeout Output Grid` (NNPDF package, see 3)

2) `NNPDF/src/pdfs.cc`

- creates randomPDFs
- **NEW: increases NNPDF sets (preserving correlations)**

3) `NNPDF/src/nnpdfrw.cc`

- reweights randomPDF based on Chi2 input file
(written out by 1)
- writes out new LHAPDF6 grid

Note: running fully in LHAPDF 6



Technical updates

1) Moving to *.cc Code

- will make re-using/sharing of code/functions easier
e.g. drawing, writing out LHAPDFs...
- working, but not yet checked into trunk ✓

2) Drop “data”-reweighting

- “data” calculation of chi2 in NNPDF framework
- needs code to read in “data”, but probably not useful

3) Implement Giele-Keller Weights

- First look: easy to do (is in basically)
- Need to propagate bool from steering to function
(would use the “data” reweighting “METHOD” field)

4) LHAPDF 5/6 switch?

- Should be easier with c++, but not sure, its needed?

Note: 1-3) easily done on the train ride back



Benchmarking of reweighting/Profiling

- **Starting point:**
 - Reweighting TeVatron data proved to be not working
 - Worry: something in the implementation of the procedure (W+jet ATLAS seemed not so good either)
- **Plan for a better investigation:**
 - Benchmark Hera(?)Fitter Code with NNPDF standalone code
 - first step: weight comparison based on chi2 from Hera
 - second step: comparison of chi2's
- **First outcome:**
 - “Bad” fit for TeVatron is solely coming from the W_{asy} data (both, CDF and D0, D0 even a bit worse)
 - could be to do with the procedure in general *or* with NNPDF parametrisation or something?
 - To check:
 - change of this using GK weights
 - check D0/CDF W_{asy} only (how look PDFs like?)
 - check out profiling result with other data only

Would be great to come up with a plan for more investigations/paper



Discussion
