

LHAPDF6 AND HERAFITTER COMPATIBILITY

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WHAT'S NEW IN LHAPDF6?

- ▶ Ground-up rewrite in C++,

do we need to write the fortran/ c++ interface?

- ▶ Uses YAML format (www.yaml.org) to save grids,

We need to update the HF output code.

LHAPDF6 has backward compatibility Fortran interface. As usual it uses lhpdf-config utility, libLHAPDF.so library and the lib contains all fortran functions HF use.

The only difference is in steering.txt

```
&lhpdf
```

```
...
```

```
LHAPDFSET = "CT10nlo.LHgrid" ! points to the file, v5 format
```

```
LHAPDFSET = "CT10nlo" ! points to the directory, v6 format
```

```
&end
```

Yaml is just a *Yet another markup language* like XML and other.

SetDesc: 'PDF fits using the standard CTEQ PDF evolution but using the HOPPET alphas_s running solution.

Excluding the D0 Run-II W asymmetry data.

mem=0 --> central

mem=1-52 --> 90% eigenvectors'

Authors: H.-L.Lai, M.Guzzi, J. Huston, Z.Li, P.M.Nadolsky, J.Pumplin and C.-P.Yuan

Reference: arXiv:1007.2241

Format: lhagrid1

DataVersion: 1

NumMembers: 53

Flavors: [-5, -4, -3, -2, -1, 1, 2, 3, 4, 5, 21]

OrderQCD: 1

...

There is a python script **creategrids** located in LHAPDF6 svn that converts LHAPDF5/6 formats.

<https://lhpdf.hepforge.org/trac/browser/migration>

It requires LHAPDF5 library as dependency.

SOLUTIONS FOR HF OUTPUT: DIRECT OUTPUT

New output interface for lhpdf v6 format is written.

Features:

- ▶ writes PDFs directly from QCDNUM grid without interpolation.
- ▶ PDFs metadata are gathered in runtime, all hardcoded metadata are removed.
- ▶ can use user defined grid to store PDFs.

still need to be well tested

USING EXTERNAL GRIDS

In steering.txt

&QCDNUM

NXBins = 250

xmin_grid(1) = 9.9D-6

xmin_grid(2) = 0.01D0

xmin_grid(3) = 0.10D0

xmin_grid(4) = 0.4D0

xmin_grid(5) = 0.7D0

...

ReportXGrid = False *! write grid to xgrid.nml file*

ReadXGrid = True *! read grid from xgrid.nml*

&End