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## Simple Demo file to read all LHAPDF Tables:

Demonstration to show how to use LHAPDF PDF tables with ManeParse  
This is a simpler demo file that just shows the basics of loading the PDFs.

### Please cite:

ManeParse : A Mathematica reader for Parton Distribution Functions  
D.B.Clark, E.Godat, F.I.Olness  
Published in : Comput.Phys.Commun .216 (2017) 126 - 137  
e - Print : 1605.08012[hep - ph]

Fred : 19 April 2021

```
In[1]:= Clear["Global`*"];  
  
In[2]:= $Version  
  
Out[2]:= 12.1.0 for Linux x86 (64-bit) (March 14, 2020)
```

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## Set Directory

This example notebook is written with relative directories and is intended to be run within the folder extracted from the tarball.

```
In[3]:= (* This just drops the leading path  
info to make the list of files easier to read *)  
dropPath = Take[(FileNameSplit /@ #) // Transpose, -1][[1]] &;  
  
In[4]:= NotebookDirectory [];  
here = NotebookDirectory []  
  
Out[5]:= /home/olness/Documents/TMP/nCTEQ15WZ/nCTEQ15WZ_check /  
  
In[6]:= (* If there is a problem with the Mathematica working directory,  
you can enter it manually here *)  
SetDirectory[here]  
  
Out[6]:= /home/olness/Documents/TMP/nCTEQ15WZ/nCTEQ15WZ_check  
  
In[7]:= (* This shows what files should be in this main directory *)  
FileNames["*", here] // dropPath  
  
Out[7]:= {LHAPDF, MP_packages, Read_nCTEQ15WZ.nb}
```

---

## Setup Other Directories

```
In[8]:= dirPackages = here <> "./MP_packages ";  
       FileNames["*", dirPackages] // dropPath  
  
Out[9]= {pdfCalc.m, pdfErrors.m, pdfParseCTEQ.m, pdfParseLHA.m, README_V05.TXT}  
  
In[10]:= dirFilesLHA = "./LHAPDF";  
        dirList = Select[FileNames["nCTEQ15WZ*", dirFilesLHA], DirectoryQ];  
        dirList // dropPath  
  
Out[12]= {nCTEQ15WZ_1_0, nCTEQ15WZ_108_47, nCTEQ15WZ_108_54, nCTEQ15WZ_1_1,  
          nCTEQ15WZ_119_50, nCTEQ15WZ_119_59, nCTEQ15WZ_12_6, nCTEQ15WZ_131_54,  
          nCTEQ15WZ_14_7, nCTEQ15WZ_16_8, nCTEQ15WZ_184_74, nCTEQ15WZ_197_79,  
          nCTEQ15WZ_197_98, nCTEQ15WZ_20_10, nCTEQ15WZ_207_103, nCTEQ15WZ_207_82,  
          nCTEQ15WZ_208_82, nCTEQ15WZ_2_1, nCTEQ15WZ_27_13, nCTEQ15WZ_3_1, nCTEQ15WZ_3_2,  
          nCTEQ15WZ_40_18, nCTEQ15WZ_40_20, nCTEQ15WZ_4_2, nCTEQ15WZ_56_26,  
          nCTEQ15WZ_56_28, nCTEQ15WZ_6_3, nCTEQ15WZ_64_29, nCTEQ15WZ_64_32, nCTEQ15WZ_7_3,  
          nCTEQ15WZ_84_36, nCTEQ15WZ_84_42, nCTEQ15WZ_9_4, nCTEQ15WZ_9_4_iso}  
  
In[13]:= Length[dirList]  
  
Out[13]= 34
```

# Load the package

Loading the main package provides many useful functions

```
In[14]:= Get[dirPackages <> "/pdfParseLHA .m"]

Version : pdfCalc 5.0
Version : ManeParse 5.0: April 2021
- Required Package : pdfCalc --Loaded -

=====

- pdfParseLHA -
Version : 5.0: April 2021
Authors : E.J. Godat , D.B. Clark & F.I. Olness

Please cite: *****
http://ncteq.hepforge.org/code/pdf.html

For a list of available commands , enter : ?pdf*
```

```
In[15]:= Get[dirPackages <> "/pdfParseCTEQ .m"]

=====

- pdfParseCTEQ -
Version : 5.0: April 2021
Authors : D.B. Clark , E.J. Godat & F.I. Olness

Please cite: *****
http://ncteq.hepforge.org/code/pdf.html

For a list of available commands , enter : ?pdf*

=====
```

```
In[16]:= Get[dirPackages <> "/pdfErrors.m"]
```

```
=====
```

```
- pdfErrors -
```

```
Version : 5.0; April 2021
```

```
Authors : D.B. Clark, E.J. Godat & F.I. Olness
```

```
Please cite: *****
```

```
http://ncteq.hepforge.org/code/pdf.html
```

```
For a list of available commands, enter: ?pdf*
```

```
=====
```

All functions begin with 'pdf'. To obtain a list of available functions, type the command '?pdf\*'.  
 =====

```
In[17]:= ? pdf*
```

```
Out[17]=
```

▼ pdfCalc`

pdfAlphaS

pdfFunction

pdfGetInfo

pdfGetXlist

pdfLuminosity

pdfReset

pdfSetList

pdfSetXposition

pdfFlavor

pdfFunctionX

pdfGetQlist

pdfLowFunction

pdfNumQuarks

pdfSetInterpolator

pdfSetListDisplay

pdfXmin

▼ pdfErrors`

pdfError

pdfHessianCorrelation

pdfMCCentral

pdfMCCorrelation

pdfFamilyFunction

pdfHessianError

pdfMCCentralInterval

pdfMCErrors

▼ pdfParseCTEQ`

pdfFamilyParseCTEQ

pdfParseCTEQ

▼ pdfParseLHA`

pdfFamilyParseLHA

pdfParseLHA

## Read All PDFs but ONLY central PDFs

```
In[18]:= pdfReset[]
Do[
  datafile = FileNames["*_0000.dat", dirList[[i]]] // First;
  infofile = FileNames["*info", dirList[[i]]] // First;
  pdfParseLHA[infofile, datafile] // Print;
  datafile = "";
  infofile = "";
  Print[" i = ", i];
  , {i, 1, Length[dirList]}]

Default Mathematica interpolator will be used.

All internal variables have been reset.

Successfully read ./LHAPDF/nCTEQ15WZ_1_0/nCTEQ15WZ_1_0.info.
Successfully read ./LHAPDF/nCTEQ15WZ_1_0/nCTEQ15WZ_1_0_0000.dat.
1
  i = 1
Successfully read ./LHAPDF/nCTEQ15WZ_108_47/nCTEQ15WZ_108_47.info.
Successfully read ./LHAPDF/nCTEQ15WZ_108_47/nCTEQ15WZ_108_47_0000.dat.
2
  i = 2
Successfully read ./LHAPDF/nCTEQ15WZ_108_54/nCTEQ15WZ_108_54.info.
Successfully read ./LHAPDF/nCTEQ15WZ_108_54/nCTEQ15WZ_108_54_0000.dat.
3
  i = 3
Successfully read ./LHAPDF/nCTEQ15WZ_1_1/nCTEQ15WZ_1_1.info.
Successfully read ./LHAPDF/nCTEQ15WZ_1_1/nCTEQ15WZ_1_1_0000.dat.
4
  i = 4
Successfully read ./LHAPDF/nCTEQ15WZ_119_50/nCTEQ15WZ_119_50.info.
Successfully read ./LHAPDF/nCTEQ15WZ_119_50/nCTEQ15WZ_119_50_0000.dat.
5
  i = 5
Successfully read ./LHAPDF/nCTEQ15WZ_119_59/nCTEQ15WZ_119_59.info.
Successfully read ./LHAPDF/nCTEQ15WZ_119_59/nCTEQ15WZ_119_59_0000.dat.
6
  i = 6
```

```

Successfully read ./LHAPDF/nCTEQ15WZ_12_6/nCTEQ15WZ_12_6.info.
Successfully read ./LHAPDF/nCTEQ15WZ_12_6/nCTEQ15WZ_12_6_0000.dat.
7
  i = 7
Successfully read ./LHAPDF/nCTEQ15WZ_131_54/nCTEQ15WZ_131_54.info.
Successfully read ./LHAPDF/nCTEQ15WZ_131_54/nCTEQ15WZ_131_54_0000.dat.
8
  i = 8
Successfully read ./LHAPDF/nCTEQ15WZ_14_7/nCTEQ15WZ_14_7.info.
Successfully read ./LHAPDF/nCTEQ15WZ_14_7/nCTEQ15WZ_14_7_0000.dat.
9
  i = 9
Successfully read ./LHAPDF/nCTEQ15WZ_16_8/nCTEQ15WZ_16_8.info.
Successfully read ./LHAPDF/nCTEQ15WZ_16_8/nCTEQ15WZ_16_8_0000.dat.
10
  i = 10
Successfully read ./LHAPDF/nCTEQ15WZ_184_74/nCTEQ15WZ_184_74.info.
Successfully read ./LHAPDF/nCTEQ15WZ_184_74/nCTEQ15WZ_184_74_0000.dat.
11
  i = 11
Successfully read ./LHAPDF/nCTEQ15WZ_197_79/nCTEQ15WZ_197_79.info.
Successfully read ./LHAPDF/nCTEQ15WZ_197_79/nCTEQ15WZ_197_79_0000.dat.
12
  i = 12
Successfully read ./LHAPDF/nCTEQ15WZ_197_98/nCTEQ15WZ_197_98.info.
Successfully read ./LHAPDF/nCTEQ15WZ_197_98/nCTEQ15WZ_197_98_0000.dat.
13
  i = 13
Successfully read ./LHAPDF/nCTEQ15WZ_20_10/nCTEQ15WZ_20_10.info.
Successfully read ./LHAPDF/nCTEQ15WZ_20_10/nCTEQ15WZ_20_10_0000.dat.
14
  i = 14
Successfully read ./LHAPDF/nCTEQ15WZ_207_103/nCTEQ15WZ_207_103.info.
Successfully read ./LHAPDF/nCTEQ15WZ_207_103/nCTEQ15WZ_207_103_0000.dat.
15
  i = 15

```

```

Successfully read ./LHAPDF/nCTEQ15WZ_207_82/nCTEQ15WZ_207_82.info.
Successfully read ./LHAPDF/nCTEQ15WZ_207_82/nCTEQ15WZ_207_82_0000.dat.
16
  i = 16
Successfully read ./LHAPDF/nCTEQ15WZ_208_82/nCTEQ15WZ_208_82.info.
Successfully read ./LHAPDF/nCTEQ15WZ_208_82/nCTEQ15WZ_208_82_0000.dat.
17
  i = 17
Successfully read ./LHAPDF/nCTEQ15WZ_2_1/nCTEQ15WZ_2_1.info.
Successfully read ./LHAPDF/nCTEQ15WZ_2_1/nCTEQ15WZ_2_1_0000.dat.
18
  i = 18
Successfully read ./LHAPDF/nCTEQ15WZ_27_13/nCTEQ15WZ_27_13.info.
Successfully read ./LHAPDF/nCTEQ15WZ_27_13/nCTEQ15WZ_27_13_0000.dat.
19
  i = 19
Successfully read ./LHAPDF/nCTEQ15WZ_3_1/nCTEQ15WZ_3_1.info.
Successfully read ./LHAPDF/nCTEQ15WZ_3_1/nCTEQ15WZ_3_1_0000.dat.
20
  i = 20
Successfully read ./LHAPDF/nCTEQ15WZ_3_2/nCTEQ15WZ_3_2.info.
Successfully read ./LHAPDF/nCTEQ15WZ_3_2/nCTEQ15WZ_3_2_0000.dat.
21
  i = 21
Successfully read ./LHAPDF/nCTEQ15WZ_40_18/nCTEQ15WZ_40_18.info.
Successfully read ./LHAPDF/nCTEQ15WZ_40_18/nCTEQ15WZ_40_18_0000.dat.
22
  i = 22
Successfully read ./LHAPDF/nCTEQ15WZ_40_20/nCTEQ15WZ_40_20.info.
Successfully read ./LHAPDF/nCTEQ15WZ_40_20/nCTEQ15WZ_40_20_0000.dat.
23
  i = 23
Successfully read ./LHAPDF/nCTEQ15WZ_4_2/nCTEQ15WZ_4_2.info.
Successfully read ./LHAPDF/nCTEQ15WZ_4_2/nCTEQ15WZ_4_2_0000.dat.
24
  i = 24

```

```

Successfully read ./LHAPDF/nCTEQ15WZ_56_26/nCTEQ15WZ_56_26.info.
Successfully read ./LHAPDF/nCTEQ15WZ_56_26/nCTEQ15WZ_56_26_0000.dat.
25
  i = 25
Successfully read ./LHAPDF/nCTEQ15WZ_56_28/nCTEQ15WZ_56_28.info.
Successfully read ./LHAPDF/nCTEQ15WZ_56_28/nCTEQ15WZ_56_28_0000.dat.
26
  i = 26
Successfully read ./LHAPDF/nCTEQ15WZ_6_3/nCTEQ15WZ_6_3.info.
Successfully read ./LHAPDF/nCTEQ15WZ_6_3/nCTEQ15WZ_6_3_0000.dat.
27
  i = 27
Successfully read ./LHAPDF/nCTEQ15WZ_64_29/nCTEQ15WZ_64_29.info.
Successfully read ./LHAPDF/nCTEQ15WZ_64_29/nCTEQ15WZ_64_29_0000.dat.
28
  i = 28
Successfully read ./LHAPDF/nCTEQ15WZ_64_32/nCTEQ15WZ_64_32.info.
Successfully read ./LHAPDF/nCTEQ15WZ_64_32/nCTEQ15WZ_64_32_0000.dat.
29
  i = 29
Successfully read ./LHAPDF/nCTEQ15WZ_7_3/nCTEQ15WZ_7_3.info.
Successfully read ./LHAPDF/nCTEQ15WZ_7_3/nCTEQ15WZ_7_3_0000.dat.
30
  i = 30
Successfully read ./LHAPDF/nCTEQ15WZ_84_36/nCTEQ15WZ_84_36.info.
Successfully read ./LHAPDF/nCTEQ15WZ_84_36/nCTEQ15WZ_84_36_0000.dat.
31
  i = 31
Successfully read ./LHAPDF/nCTEQ15WZ_84_42/nCTEQ15WZ_84_42.info.
Successfully read ./LHAPDF/nCTEQ15WZ_84_42/nCTEQ15WZ_84_42_0000.dat.
32
  i = 32
Successfully read ./LHAPDF/nCTEQ15WZ_9_4/nCTEQ15WZ_9_4.info.
Successfully read ./LHAPDF/nCTEQ15WZ_9_4/nCTEQ15WZ_9_4_0000.dat.
33
  i = 33

```



Successfully read ./LHAPDF/nCTEQ15WZ\_9\_4\_iso/nCTEQ15WZ\_9\_4.info.

Successfully read ./LHAPDF/nCTEQ15WZ\_9\_4\_iso/nCTEQ15WZ\_9\_4\_0000.dat.

34

i = 34

In[20]:= Length[dirList]

Out[20]= 34

In[21]:= pdfSetListDisplay []

Set Number	File Name	Max Flavors	Valance Flavors
1	./LHAPDF/nCTEQ15WZ_1_0/nCTEQ15WZ_1_0_0000.dat	5	n/a
2	./LHAPDF/nCTEQ15WZ_108_47/nCTEQ15WZ_108_47_0000.dat	5	n/a
3	./LHAPDF/nCTEQ15WZ_108_54/nCTEQ15WZ_108_54_0000.dat	5	n/a
4	./LHAPDF/nCTEQ15WZ_1_1/nCTEQ15WZ_1_1_0000.dat	5	n/a
5	./LHAPDF/nCTEQ15WZ_119_50/nCTEQ15WZ_119_50_0000.dat	5	n/a
6	./LHAPDF/nCTEQ15WZ_119_59/nCTEQ15WZ_119_59_0000.dat	5	n/a
7	./LHAPDF/nCTEQ15WZ_12_6/nCTEQ15WZ_12_6_0000.dat	5	n/a
8	./LHAPDF/nCTEQ15WZ_131_54/nCTEQ15WZ_131_54_0000.dat	5	n/a
9	./LHAPDF/nCTEQ15WZ_14_7/nCTEQ15WZ_14_7_0000.dat	5	n/a
10	./LHAPDF/nCTEQ15WZ_16_8/nCTEQ15WZ_16_8_0000.dat	5	n/a
11	./LHAPDF/nCTEQ15WZ_184_74/nCTEQ15WZ_184_74_0000.dat	5	n/a
12	./LHAPDF/nCTEQ15WZ_197_79/nCTEQ15WZ_197_79_0000.dat	5	n/a
13	./LHAPDF/nCTEQ15WZ_197_98/nCTEQ15WZ_197_98_0000.dat	5	n/a
14	./LHAPDF/nCTEQ15WZ_20_10/nCTEQ15WZ_20_10_0000.dat	5	n/a
15	./LHAPDF/nCTEQ15WZ_207_103/nCTEQ15WZ_207_103_0000.dat	5	n/a

Out[21]=

16	./LHAPDF/nCTEQ15WZ_207_82/nCTEQ15WZ_207_82_0000.dat	5	n/a
17	./LHAPDF/nCTEQ15WZ_208_82/nCTEQ15WZ_208_82_0000.dat	5	n/a
18	./LHAPDF/nCTEQ15WZ_2_1/nCTEQ15WZ_2_1_0000.dat	5	n/a
19	./LHAPDF/nCTEQ15WZ_27_13/nCTEQ15WZ_27_13_0000.dat	5	n/a
20	./LHAPDF/nCTEQ15WZ_3_1/nCTEQ15WZ_3_1_0000.dat	5	n/a
21	./LHAPDF/nCTEQ15WZ_3_2/nCTEQ15WZ_3_2_0000.dat	5	n/a
22	./LHAPDF/nCTEQ15WZ_40_18/nCTEQ15WZ_40_18_0000.dat	5	n/a
23	./LHAPDF/nCTEQ15WZ_40_20/nCTEQ15WZ_40_20_0000.dat	5	n/a
24	./LHAPDF/nCTEQ15WZ_4_2/nCTEQ15WZ_4_2_0000.dat	5	n/a
25	./LHAPDF/nCTEQ15WZ_56_26/nCTEQ15WZ_56_26_0000.dat	5	n/a
26	./LHAPDF/nCTEQ15WZ_56_28/nCTEQ15WZ_56_28_0000.dat	5	n/a
27	./LHAPDF/nCTEQ15WZ_6_3/nCTEQ15WZ_6_3_0000.dat	5	n/a
28	./LHAPDF/nCTEQ15WZ_64_29/nCTEQ15WZ_64_29_0000.dat	5	n/a
29	./LHAPDF/nCTEQ15WZ_64_32/nCTEQ15WZ_64_32_0000.dat	5	n/a
30	./LHAPDF/nCTEQ15WZ_7_3/nCTEQ15WZ_7_3_0000.dat	5	n/a
31	./LHAPDF/nCTEQ15WZ_84_36/nCTEQ15WZ_84_36_0000.dat	5	n/a
32	./LHAPDF/nCTEQ15WZ_84_42/nCTEQ15WZ_84_42_0000.dat	5	n/a
33	./LHAPDF/nCTEQ15WZ_9_4/nCTEQ15WZ_9_4_0000.dat	5	n/a
34	./LHAPDF/nCTEQ15WZ_9_4_iso/nCTEQ15WZ_9_4_0000.dat	5	n/a

## Define PDF

```

In[22]:= pdf[x_] := pdfFunction[x]
          SetAttributes[pdf, Listable]

In[24]:= Clear[dropPath]

In[25]:= (* This just drops the leading path
          info to make the list of files easier to read *)
          (* dropPath=((Take[#, -1]&/@(FileNameSplit /@#))& *)
          dropPath = (# // FileNameSplit // Last) &

Out[25]= Last[FileNameSplit[#, 1]] &

```

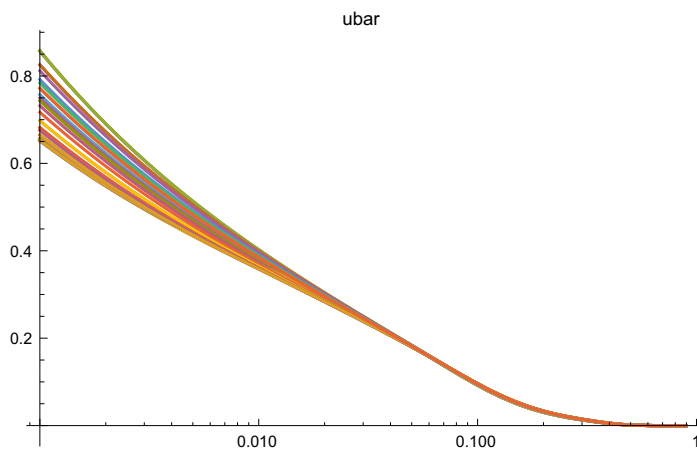
## Look at PDFs:

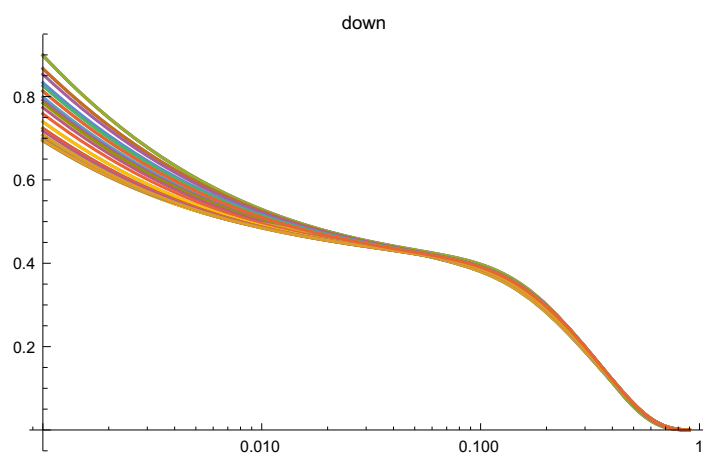
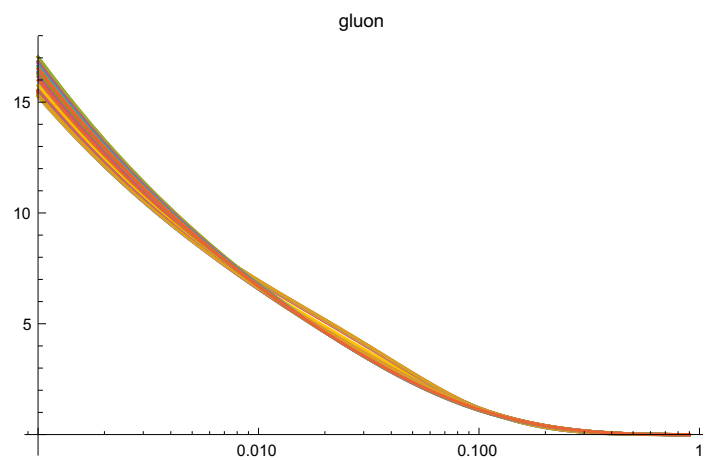
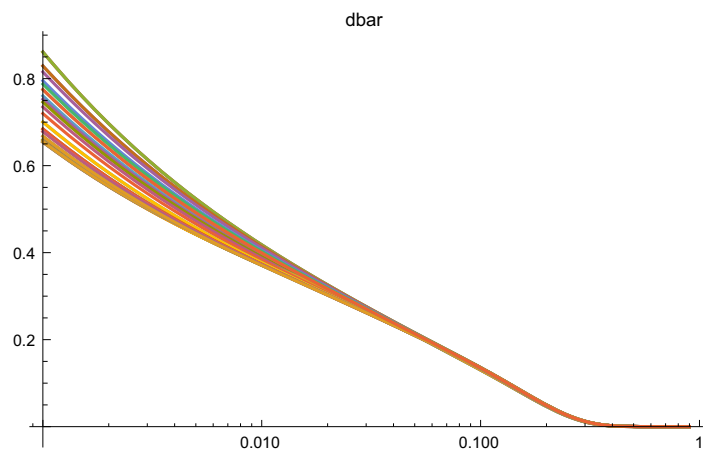
```

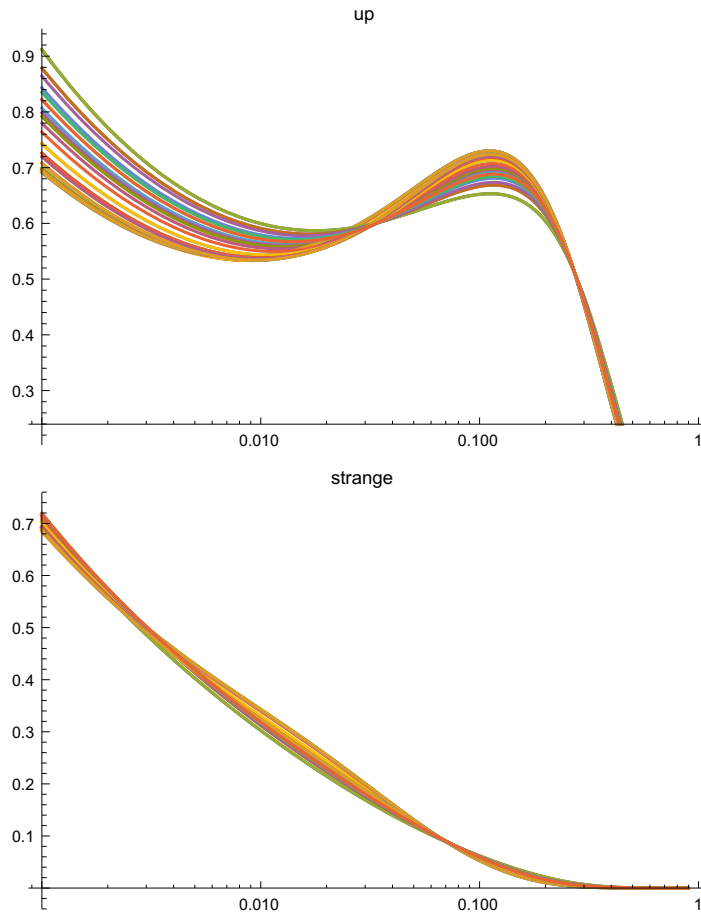
In[26]:= q0 = 10;
          len = Length[pdfSetList];

In[28]:= Do[
          LogLinearPlot[x pdf[Range[len], i, x, q0] // Evaluate,
            {x, 0.001, 0.9}, PlotLabel -> pdfFlavor[i]] // Print;
          ,
          {i,
            -2,
            3,
            1}]

```







## Read All PDFs INCLUDING error PDFs

```
In[29]:= dirLen = Length[dirList]
```

```
Out[29]= 34
```

```
In[30]:= pdfReset []
```

```
Do[
```

```
  pdfFamilyParseLHA [dirList[[i]]] // Print;
```

```
  Print[" i = ", i];
```

```
  , {i, 1, dirLen}]
```

```
Default Mathematica interpolator will be used.
```

```
All internal variables have been reset.
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_1_0/nCTEQ15WZ_1_0.info.
```

```
Included 39 files in the PDF family.
```

```
{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20,
 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39}
```

```
i = 1
```

```

Successfully read ./LHAPDF/nCTEQ15WZ_108_47/nCTEQ15WZ_108_47.info .
Included 39 files in the PDF family .
{40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58,
  59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78}
i = 2

Successfully read ./LHAPDF/nCTEQ15WZ_108_54/nCTEQ15WZ_108_54.info .
Included 39 files in the PDF family .
{79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100,
  101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117}
i = 3

Successfully read ./LHAPDF/nCTEQ15WZ_1_1/nCTEQ15WZ_1_1.info .
Included 39 files in the PDF family .
{118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128,
  129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142,
  143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156}
i = 4

Successfully read ./LHAPDF/nCTEQ15WZ_119_50/nCTEQ15WZ_119_50.info .
Included 39 files in the PDF family .
{157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167,
  168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181,
  182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195}
i = 5

Successfully read ./LHAPDF/nCTEQ15WZ_119_59/nCTEQ15WZ_119_59.info .
Included 39 files in the PDF family .
{196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206,
  207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220,
  221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234}
i = 6

Successfully read ./LHAPDF/nCTEQ15WZ_12_6/nCTEQ15WZ_12_6.info .
Included 39 files in the PDF family .
{235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245,
  246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259,
  260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273}
i = 7

Successfully read ./LHAPDF/nCTEQ15WZ_131_54/nCTEQ15WZ_131_54.info .
Included 39 files in the PDF family .
{274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284,
  285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298,
  299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312}

```

```

i = 8
Successfully read ./LHAPDF/nCTEQ15WZ_14_7/nCTEQ15WZ_14_7.info.
Included 39 files in the PDF family.
{313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323,
 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337,
 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351}
i = 9
Successfully read ./LHAPDF/nCTEQ15WZ_16_8/nCTEQ15WZ_16_8.info.
Included 39 files in the PDF family.
{352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362,
 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376,
 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390}
i = 10
Successfully read ./LHAPDF/nCTEQ15WZ_184_74/nCTEQ15WZ_184_74.info.
Included 39 files in the PDF family.
{391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401,
 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415,
 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429}
i = 11
Successfully read ./LHAPDF/nCTEQ15WZ_197_79/nCTEQ15WZ_197_79.info.
Included 39 files in the PDF family.
{430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440,
 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454,
 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468}
i = 12
Successfully read ./LHAPDF/nCTEQ15WZ_197_98/nCTEQ15WZ_197_98.info.
Included 39 files in the PDF family.
{469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479,
 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493,
 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507}
i = 13
Successfully read ./LHAPDF/nCTEQ15WZ_20_10/nCTEQ15WZ_20_10.info.
Included 39 files in the PDF family.
{508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518,
 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532,
 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546}
i = 14
Successfully read ./LHAPDF/nCTEQ15WZ_207_103/nCTEQ15WZ_207_103.info.
Included 39 files in the PDF family.

```

```
{547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557,
  558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571,
  572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585}
```

```
i = 15
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_207_82/nCTEQ15WZ_207_82.info.
```

```
Included 39 files in the PDF family.
```

```
{586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596,
  597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610,
  611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624}
```

```
i = 16
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_208_82/nCTEQ15WZ_208_82.info.
```

```
Included 39 files in the PDF family.
```

```
{625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635,
  636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649,
  650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663}
```

```
i = 17
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_2_1/nCTEQ15WZ_2_1.info.
```

```
Included 39 files in the PDF family.
```

```
{664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674,
  675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688,
  689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702}
```

```
i = 18
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_27_13/nCTEQ15WZ_27_13.info.
```

```
Included 39 files in the PDF family.
```

```
{703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713,
  714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727,
  728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741}
```

```
i = 19
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_3_1/nCTEQ15WZ_3_1.info.
```

```
Included 39 files in the PDF family.
```

```
{742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752,
  753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766,
  767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780}
```

```
i = 20
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_3_2/nCTEQ15WZ_3_2.info.
```

```
Included 39 files in the PDF family.
```

```
{781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791,
  792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805,
  806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819}
```



```

i = 21
Successfully read ./LHAPDF/nCTEQ15WZ_40_18/nCTEQ15WZ_40_18.info.
Included 39 files in the PDF family.
{820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830,
 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844,
 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858}

i = 22
Successfully read ./LHAPDF/nCTEQ15WZ_40_20/nCTEQ15WZ_40_20.info.
Included 39 files in the PDF family.
{859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869,
 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883,
 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897}

i = 23
Successfully read ./LHAPDF/nCTEQ15WZ_4_2/nCTEQ15WZ_4_2.info.
Included 39 files in the PDF family.
{898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908,
 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922,
 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936}

i = 24
Successfully read ./LHAPDF/nCTEQ15WZ_56_26/nCTEQ15WZ_56_26.info.
Included 39 files in the PDF family.
{937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947,
 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961,
 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975}

i = 25
Successfully read ./LHAPDF/nCTEQ15WZ_56_28/nCTEQ15WZ_56_28.info.
Included 39 files in the PDF family.
{976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988,
 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002,
 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014}

i = 26
Successfully read ./LHAPDF/nCTEQ15WZ_6_3/nCTEQ15WZ_6_3.info.
Included 39 files in the PDF family.
{1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027,
 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040,
 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053}

i = 27
Successfully read ./LHAPDF/nCTEQ15WZ_64_29/nCTEQ15WZ_64_29.info.
Included 39 files in the PDF family.

```

```
{1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066,
  1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079,
  1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092}
```

```
i = 28
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_64_32/nCTEQ15WZ_64_32.info.
```

```
Included 39 files in the PDF family.
```

```
{1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105,
  1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118,
  1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131}
```

```
i = 29
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_7_3/nCTEQ15WZ_7_3.info.
```

```
Included 39 files in the PDF family.
```

```
{1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144,
  1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157,
  1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170}
```

```
i = 30
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_84_36/nCTEQ15WZ_84_36.info.
```

```
Included 39 files in the PDF family.
```

```
{1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183,
  1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196,
  1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209}
```

```
i = 31
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_84_42/nCTEQ15WZ_84_42.info.
```

```
Included 39 files in the PDF family.
```

```
{1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222,
  1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235,
  1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248}
```

```
i = 32
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_9_4/nCTEQ15WZ_9_4.info.
```

```
Included 39 files in the PDF family.
```

```
{1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261,
  1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274,
  1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287}
```

```
i = 33
```

```
Successfully read ./LHAPDF/nCTEQ15WZ_9_4_iso/nCTEQ15WZ_9_4.info.
```

```
Included 39 files in the PDF family.
```

```
{1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300,
  1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313,
  1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326}
```

i = 34

## Look at PDFs

```
In[32]:= q0 = 10;  
x0 = 0.1;  
ipart0 = 1;  
len = Length[pdfSetList]
```

Out[35]= 1326

```
In[36]:= nsets = Length[dirList]
```

Out[36]= 34

```
In[37]:= pdf[Range[len], 0, 0.1, 10]
```

[illegible]

11.3277, 11.1862, 11.4246, 11.3397, 11.2622, 11.3021, 11.3037, 11.2648, 11.3387,  
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 12.0673, 11.814, 11.8936, 11.7924, 11.9761, 11.7863, 12.5981, 12.0559, 11.8941,  
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 11.5394, 11.7686, 11.2384, 12.0745, 11.8044, 11.5102, 11.728, 11.5944, 11.5627,  
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 11.8437, 11.7924, 11.7407, 11.839, 11.7363, 11.8395, 11.7537, 11.9283, 11.7896,  
 11.7413, 11.5517, 12.0092, 11.8208, 11.6527, 11.7266, 11.7987, 11.6913, 11.8226,  
 11.6391, 11.9021, 11.3429, 12.2195, 11.933, 11.6226, 11.8674, 11.6936, 11.6557,  
 11.8979, 11.6209, 11.9815, 11.8518, 11.6999, 11.7769, 11.1146, 12.4637, 11.698,  
 11.9742, 11.9746, 11.7646, 11.8437, 11.7924, 11.7407, 11.839, 11.7363, 11.8395,  
 11.7537, 11.9283, 11.7896, 11.7413, 11.5517, 12.0092, 11.8208, 11.6527, 11.7266,  
 11.7987, 11.6913, 11.8226, 11.6391, 11.9021, 11.3429, 12.2195, 11.933, 11.6226,  
 11.8674, 11.6936, 11.6557, 11.8979, 11.6209, 11.9815, 11.8518, 11.6999, 11.1589,  
 10.9823, 11.3921, 11.1226, 11.2071, 11.2319, 11.1059, 11.1753, 11.1498, 11.143,

```

11.181, 11.14, 11.1847, 11.1369, 11.1897, 11.1453, 11.1765, 11.0775, 11.2368,
11.1769, 11.1361, 11.1568, 11.1565, 11.1338, 11.1785, 11.1281, 11.1882,
10.9844, 11.3482, 11.2265, 11.089, 11.1745, 11.1444, 11.1349, 11.1831, 11.1443,
11.1793, 11.1626, 11.1552, 11.8243, 11.127, 12.5353, 11.7507, 12.0394, 12.0262,
11.83, 11.8959, 11.8497, 11.7885, 11.8896, 11.7845, 11.8884, 11.8105, 11.9905,
11.8441, 11.7743, 11.59, 12.0679, 11.8609, 11.6936, 11.7668, 11.851, 11.7347,
11.8686, 11.6793, 11.9546, 11.3917, 12.2766, 11.9832, 11.6696, 11.925, 11.7314,
11.6914, 11.9563, 11.6494, 12.0509, 11.9137, 11.7319, 11.8243, 11.127, 12.5353,
11.7507, 12.0394, 12.0262, 11.83, 11.8959, 11.8497, 11.7885, 11.8896, 11.7845,
11.8884, 11.8105, 11.9905, 11.8441, 11.7743, 11.59, 12.0679, 11.8609, 11.6936,
11.7668, 11.851, 11.7347, 11.8686, 11.6793, 11.9546, 11.3917, 12.2766, 11.9832,
11.6696, 11.925, 11.7314, 11.6914, 11.9563, 11.6494, 12.0509, 11.9137, 11.7319,
11.1892, 10.9895, 11.4507, 11.1484, 11.2437, 11.2716, 11.1313, 11.2086, 11.1784,
11.1712, 11.214, 11.1678, 11.2182, 11.1641, 11.2249, 11.1747, 11.2079, 11.0994,
11.2753, 11.2102, 11.1621, 11.187, 11.1861, 11.1604, 11.2114, 11.1531, 11.2237,
10.9945, 11.3984, 11.2629, 11.1129, 11.2071, 11.1725, 11.1621, 11.2165, 11.1715,
11.2138, 11.1938, 11.1845, 11.9155, 11.1519, 12.6732, 11.8621, 12.1762,
12.1299, 11.9673, 12.0022, 11.9679, 11.8808, 11.9901, 11.8779, 11.984, 11.9298,
12.122, 11.9539, 11.8271, 11.6644, 12.1826, 11.9255, 11.7762, 11.8415, 11.9551,
11.8176, 11.9541, 11.7576, 12.0524, 11.5027, 12.389, 12.0773, 11.7661, 12.0417,
11.7989, 11.7569, 12.0716, 11.6988, 12.1874, 12.0447, 11.7807, 11.9155, 11.1519,
12.6732, 11.8621, 12.1762, 12.1299, 11.9673, 12.0022, 11.9679, 11.8808, 11.9901,
11.8779, 11.984, 11.9298, 12.122, 11.9539, 11.8271, 11.6644, 12.1826, 11.9255,
11.7762, 11.8415, 11.9551, 11.8176, 11.9541, 11.7576, 12.0524, 11.5027, 12.389,
12.0773, 11.7661, 12.0417, 11.7989, 11.7569, 12.0716, 11.6988, 12.1874, 12.0447,
11.7807, 11.2416, 11.0011, 11.5518, 11.1934, 11.3072, 11.3402, 11.1766,
11.2662, 11.2282, 11.2202, 11.271, 11.2161, 11.2759, 11.2116, 11.2863, 11.2259,
11.2618, 11.1378, 11.3419, 11.2679, 11.2069, 11.2388, 11.238, 11.2068, 11.2683,
11.1961, 11.2853, 11.0126, 11.484, 11.3257, 11.1547, 11.2638, 11.2211, 11.2089,
11.2747, 11.2178, 11.2749, 11.2482, 11.235, 11.2416, 11.0011, 11.5518, 11.1934,
11.3072, 11.3402, 11.1766, 11.2662, 11.2282, 11.2202, 11.271, 11.2161, 11.2759,
11.2116, 11.2863, 11.2259, 11.2618, 11.1378, 11.3419, 11.2679, 11.2069,
11.2388, 11.238, 11.2068, 11.2683, 11.1961, 11.2853, 11.0126, 11.484, 11.3257,
11.1547, 11.2638, 11.2211, 11.2089, 11.2747, 11.2178, 11.2749, 11.2482, 11.235}

```

```

In[38]:= (* Extract the directory names *)
npdfDirs = Map[(Take[StringSplit[#, "/"], {-2}]) &, pdfSetList[[All, 2]]] // Flatten;
(* Count the number in each *)
nErrorPdfs = Select[npdfDirs, StringMatchQ[npdfDirs[[1]], #] &] // Length

```

Out[39]= 39

```
In[40]:= Table[pdfFunction[iset, 0, 0.1, 10.], {iset, 1, nErrorPdfs, 1}]
```

```
Out[40]= {10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797,
  10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797,
  10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797,
  10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797,
  10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797, 10.8797}
```

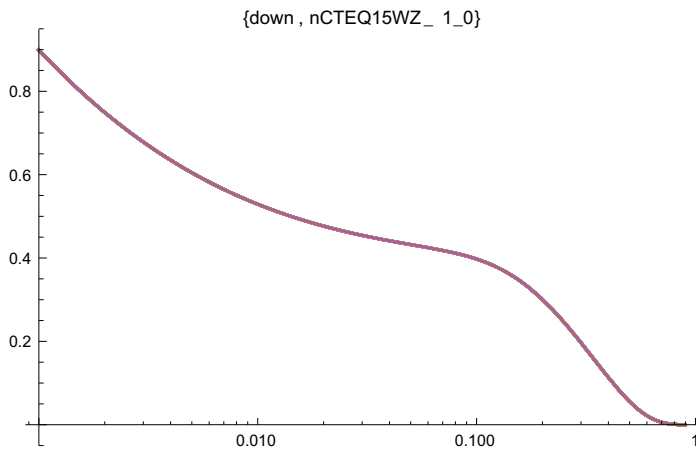
```
In[41]:= nsets
```

```
Out[41]= 34
```

```
In[42]:= Do[
  range = Range[nErrorPdfs] + i nErrorPdfs ;
  index = nErrorPdfs (i + 1);
  Print["index = ", index, " \n range = ", range];
  LogLinearPlot[x pdf[range, ipart0, x, q0] // Evaluate ,
    {x, 0.001, 0.9}, PlotLabel -> {pdfFlavor[ipart0], npdfDirs[[index]]} // Print ;
  , {i, 0, nsets - 1}]
```

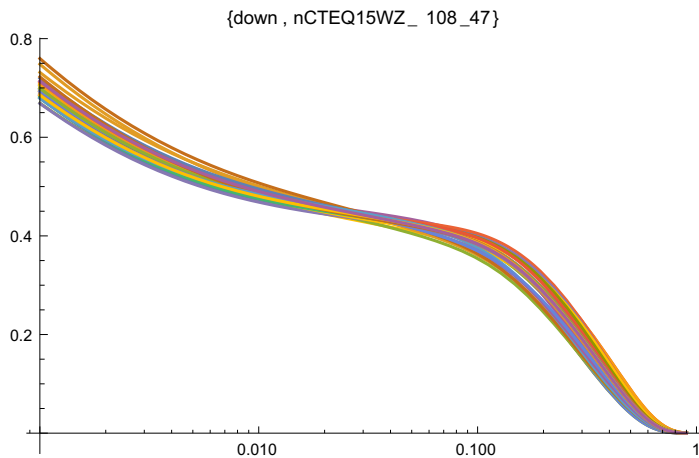
```
index = 39
```

```
range = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,
  20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39}
```



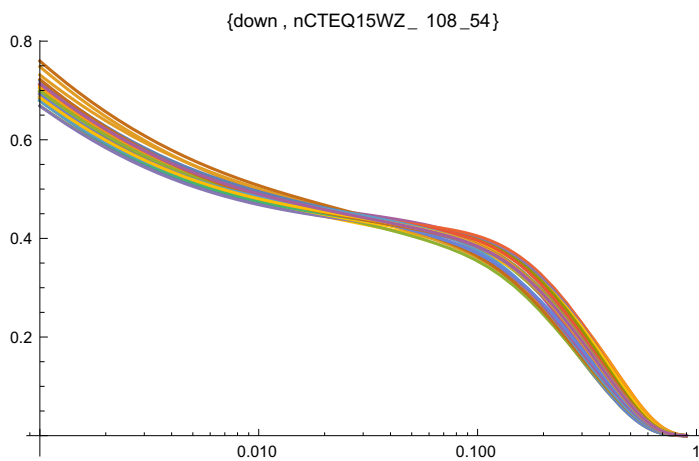
```
index = 78
```

```
range = {40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57,
  58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78}
```



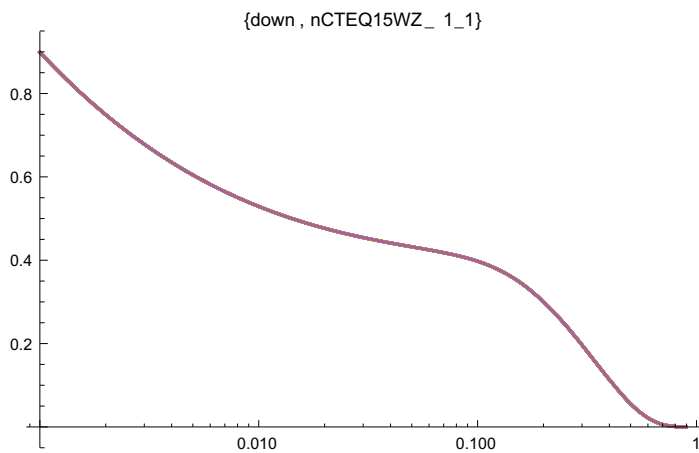
index = 117

range = {79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117}



index = 156

range = {118, 119, 120, 121, 122, 123, 124, 125, 126,  
127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141,  
142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156}

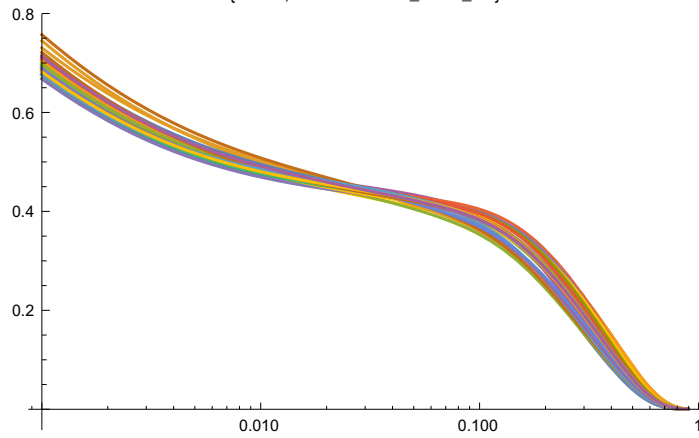




```
index = 195
```

```
range = {157, 158, 159, 160, 161, 162, 163, 164, 165,
         166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180,
         181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195}
```

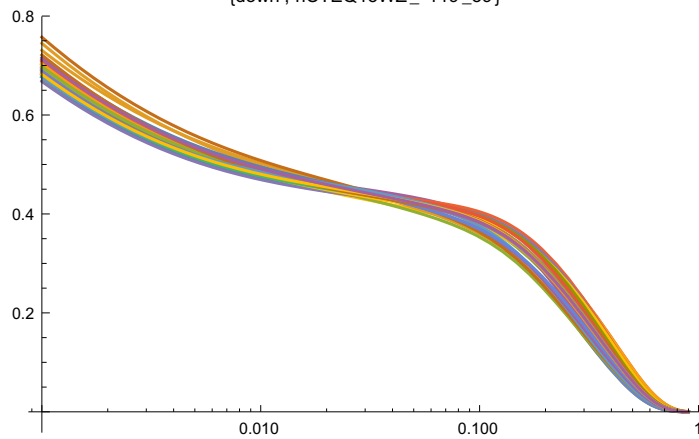
```
{down, nCTEQ15WZ_119_50}
```



```
index = 234
```

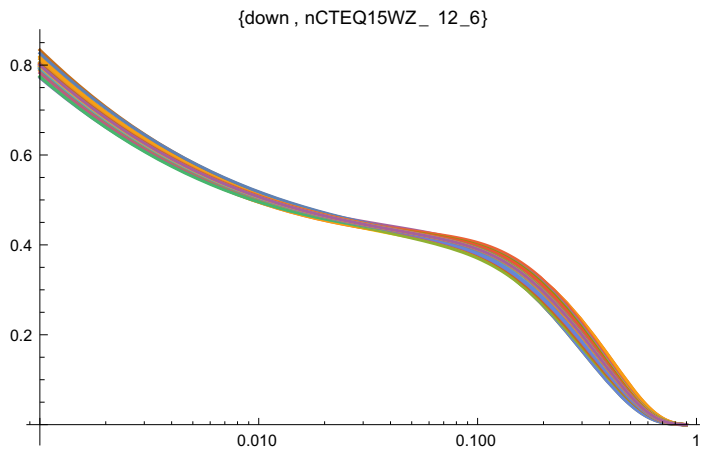
```
range = {196, 197, 198, 199, 200, 201, 202, 203, 204,
         205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219,
         220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234}
```

```
{down, nCTEQ15WZ_119_59}
```



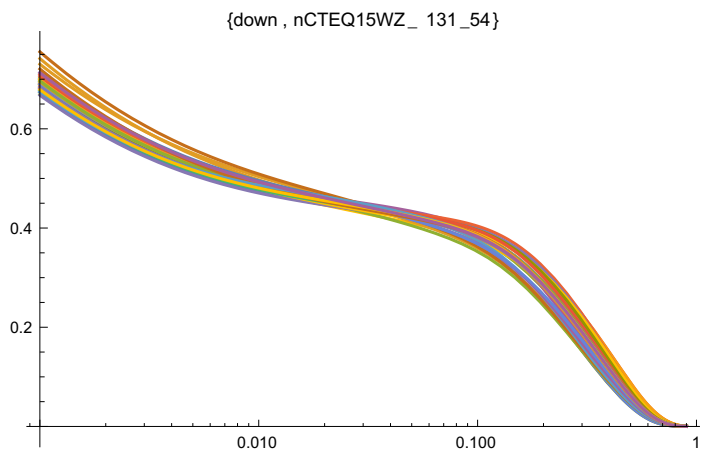
```
index = 273
```

```
range = {235, 236, 237, 238, 239, 240, 241, 242, 243,
         244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258,
         259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273}
```



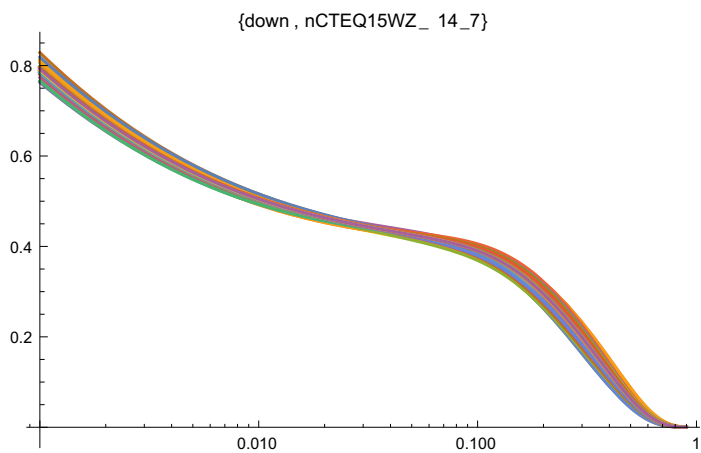
index = 312

range = {274, 275, 276, 277, 278, 279, 280, 281, 282,  
283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297,  
298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312}



index = 351

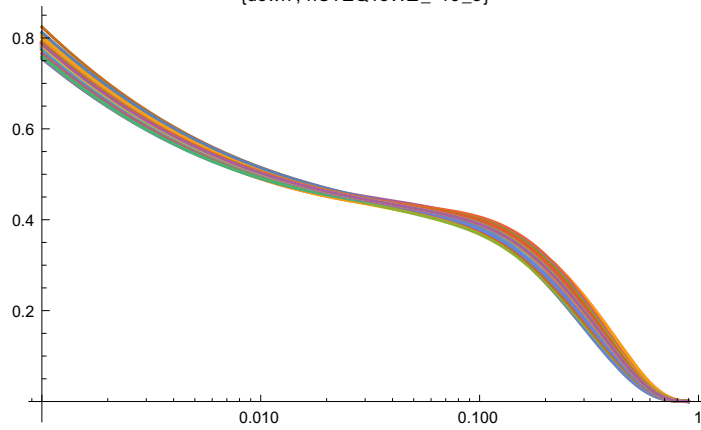
range = {313, 314, 315, 316, 317, 318, 319, 320, 321,  
322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336,  
337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351}



```
index = 390
```

```
range = {352, 353, 354, 355, 356, 357, 358, 359, 360,
  361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375,
  376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390}
```

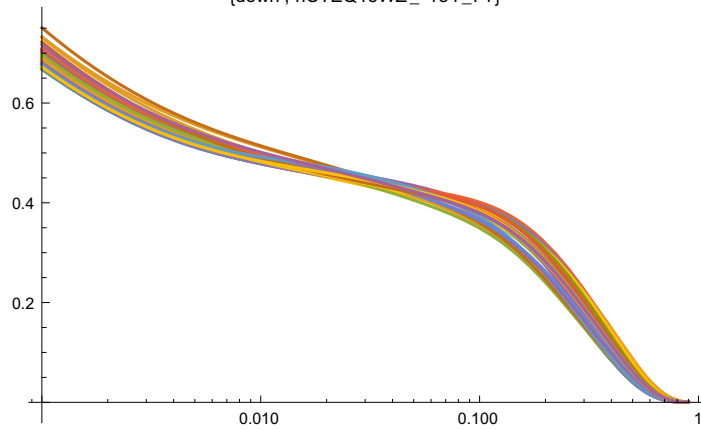
```
{down, nCTEQ15WZ_16_8}
```



```
index = 429
```

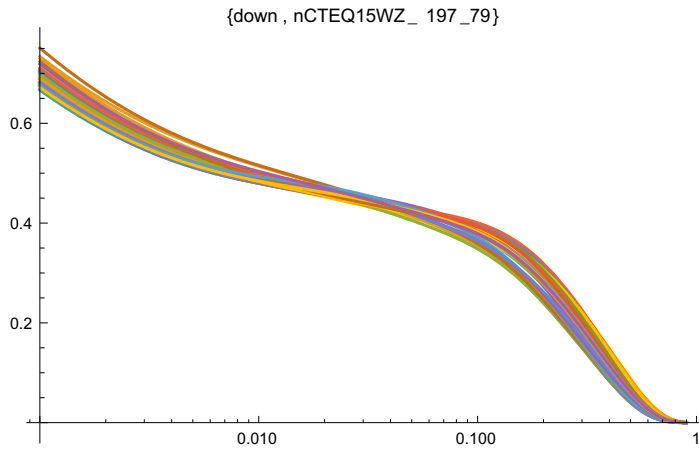
```
range = {391, 392, 393, 394, 395, 396, 397, 398, 399,
  400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414,
  415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429}
```

```
{down, nCTEQ15WZ_184_74}
```



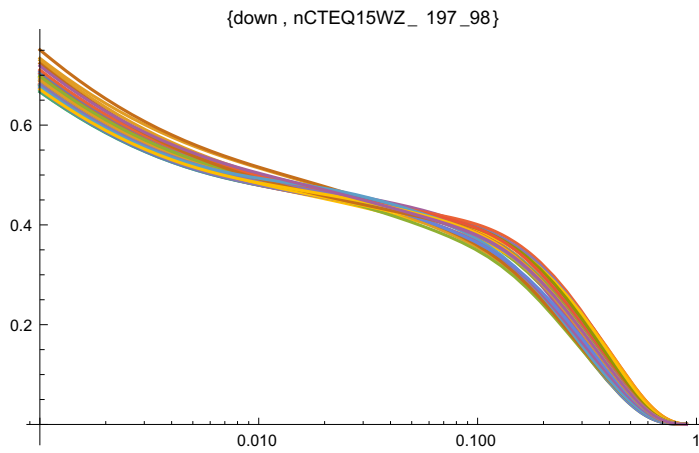
```
index = 468
```

```
range = {430, 431, 432, 433, 434, 435, 436, 437, 438,
  439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453,
  454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468}
```



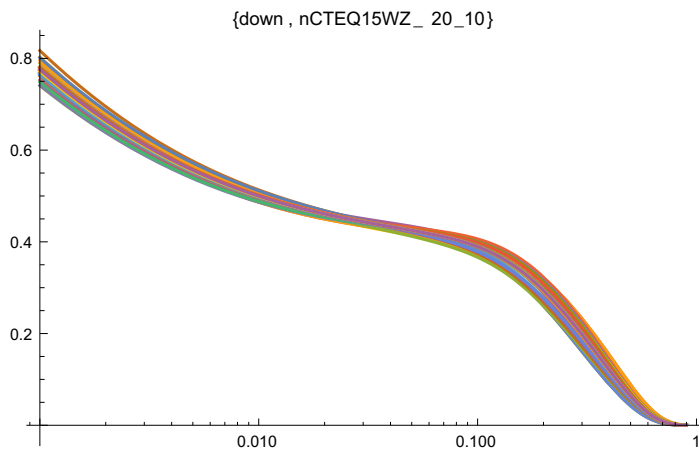
index = 507

range = {469, 470, 471, 472, 473, 474, 475, 476, 477,  
478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492,  
493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507}



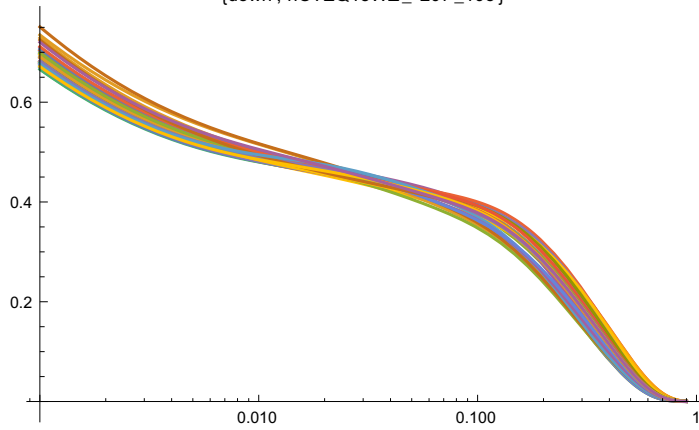
index = 546

range = {508, 509, 510, 511, 512, 513, 514, 515, 516,  
517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531,  
532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546}



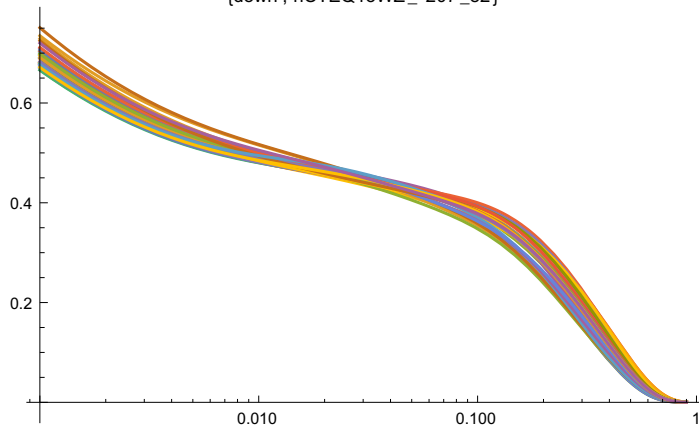
```
index = 585
```

```
range = {547, 548, 549, 550, 551, 552, 553, 554, 555,
         556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570,
         571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585}
{down, nCTEQ15WZ_207_103}
```



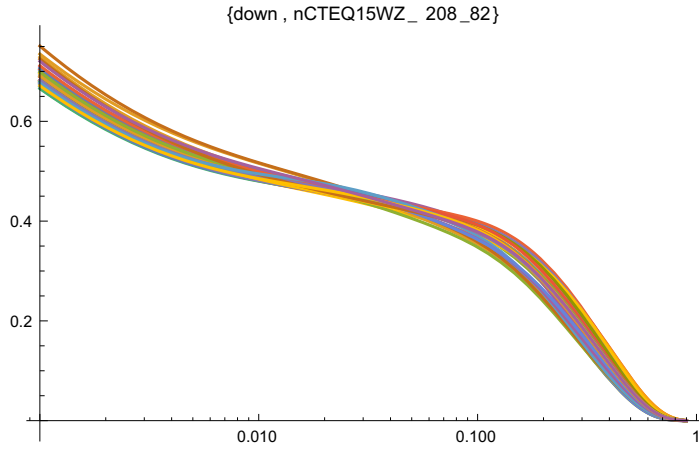
```
index = 624
```

```
range = {586, 587, 588, 589, 590, 591, 592, 593, 594,
         595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609,
         610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624}
{down, nCTEQ15WZ_207_82}
```



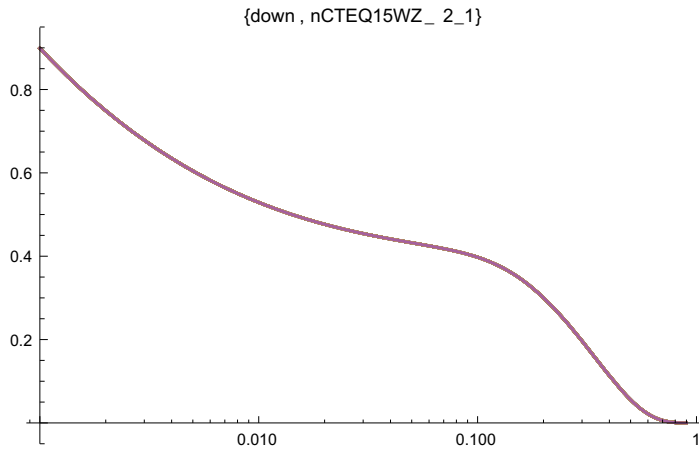
```
index = 663
```

```
range = {625, 626, 627, 628, 629, 630, 631, 632, 633,
         634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648,
         649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663}
```



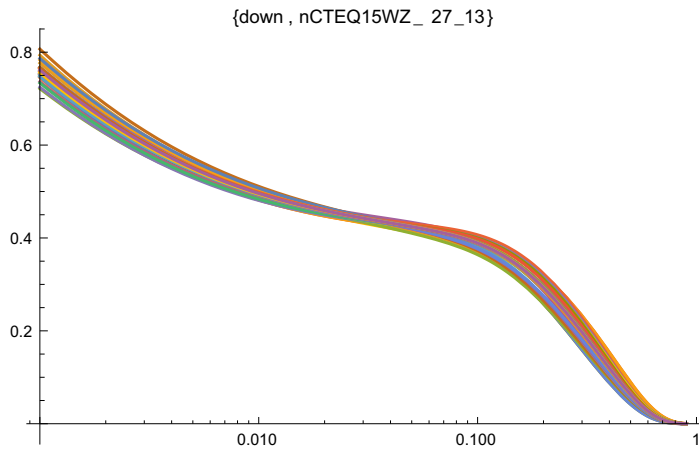
index = 702

range = {664, 665, 666, 667, 668, 669, 670, 671, 672,  
673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687,  
688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702}



index = 741

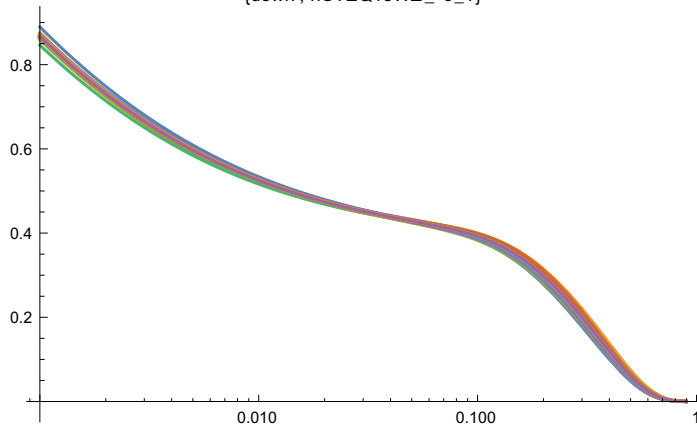
range = {703, 704, 705, 706, 707, 708, 709, 710, 711,  
712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726,  
727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741}



```
index = 780
```

```
range = {742, 743, 744, 745, 746, 747, 748, 749, 750,
  751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765,
  766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780}
```

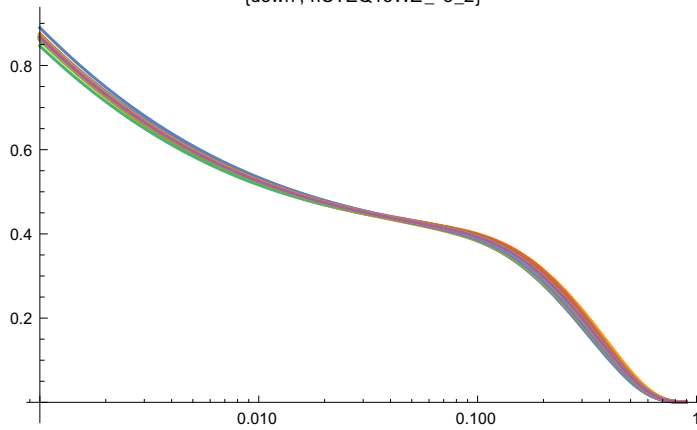
```
{down, nCTEQ15WZ_3_1}
```



```
index = 819
```

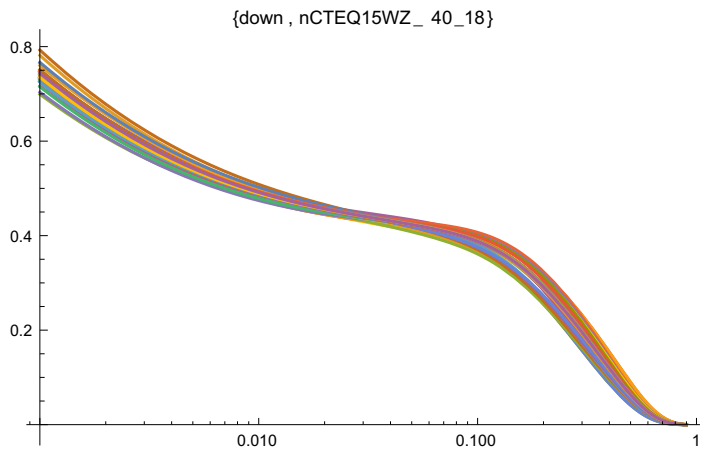
```
range = {781, 782, 783, 784, 785, 786, 787, 788, 789,
  790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804,
  805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819}
```

```
{down, nCTEQ15WZ_3_2}
```



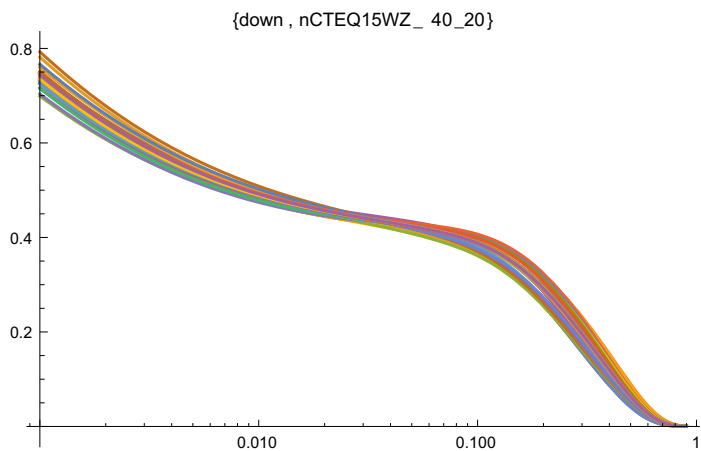
```
index = 858
```

```
range = {820, 821, 822, 823, 824, 825, 826, 827, 828,
  829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843,
  844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858}
```



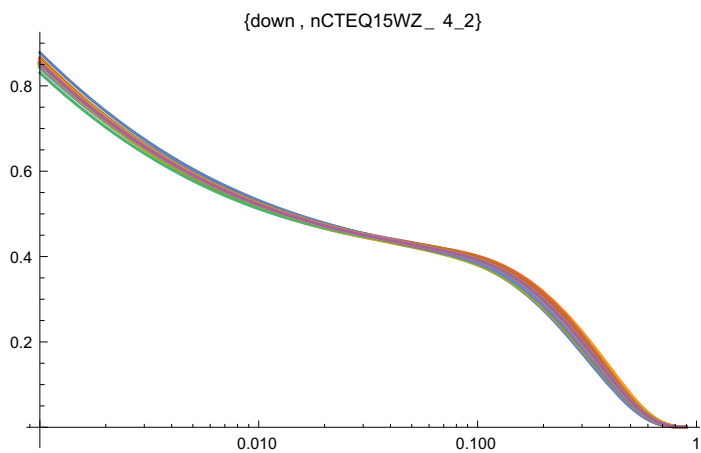
index = 897

range = {859, 860, 861, 862, 863, 864, 865, 866, 867,  
868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882,  
883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897}



index = 936

range = {898, 899, 900, 901, 902, 903, 904, 905, 906,  
907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921,  
922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936}

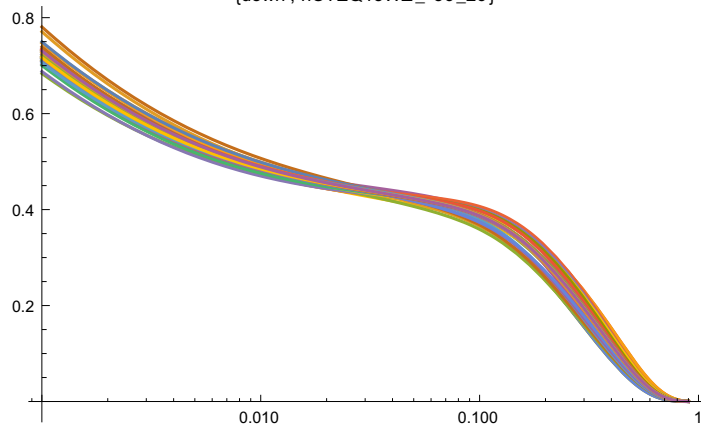




```
index = 975
```

```
range = {937, 938, 939, 940, 941, 942, 943, 944, 945,
  946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960,
  961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975}
```

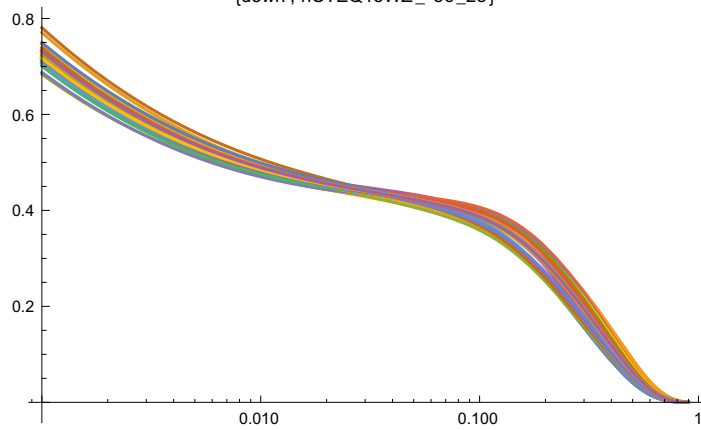
```
{down, nCTEQ15WZ_56_26}
```



```
index = 1014
```

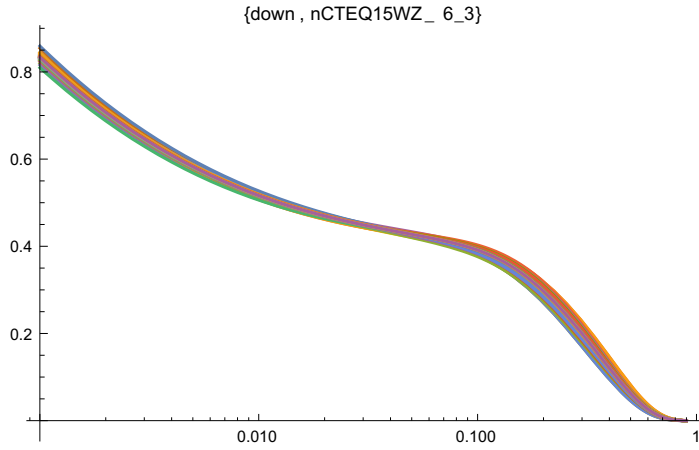
```
range = {976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986,
  987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001,
  1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014}
```

```
{down, nCTEQ15WZ_56_28}
```



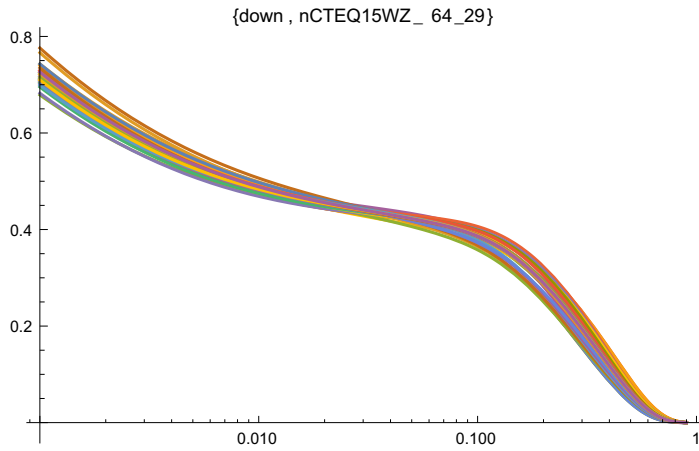
```
index = 1053
```

```
range = {1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026,
  1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039,
  1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053}
```



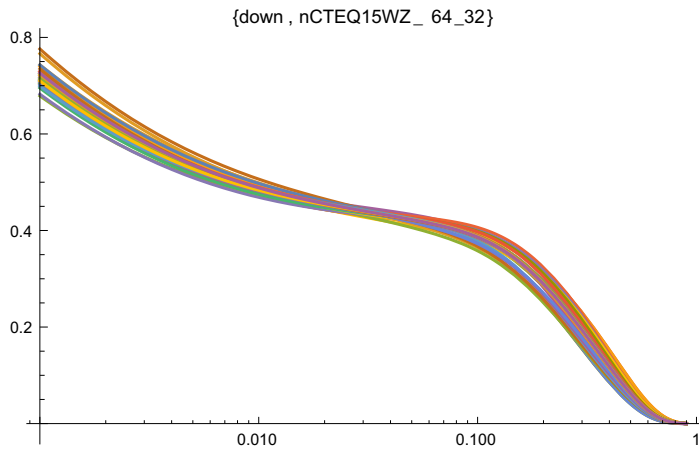
index = 1092

range = {1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065,  
1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078,  
1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092}



index = 1131

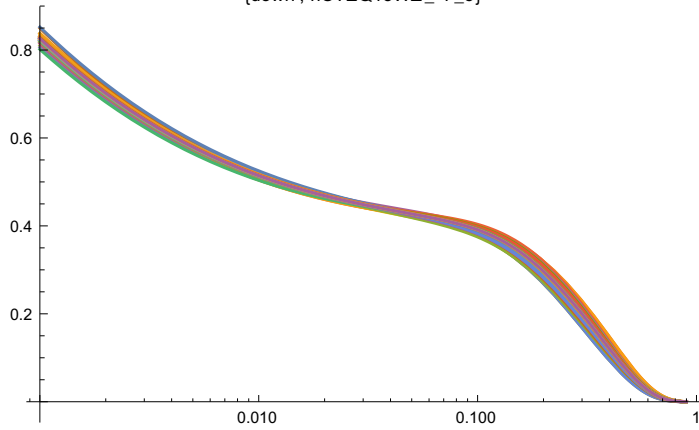
range = {1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104,  
1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117,  
1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131}



```
index = 1170
```

```
range = {1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143,
  1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156,
  1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170}
```

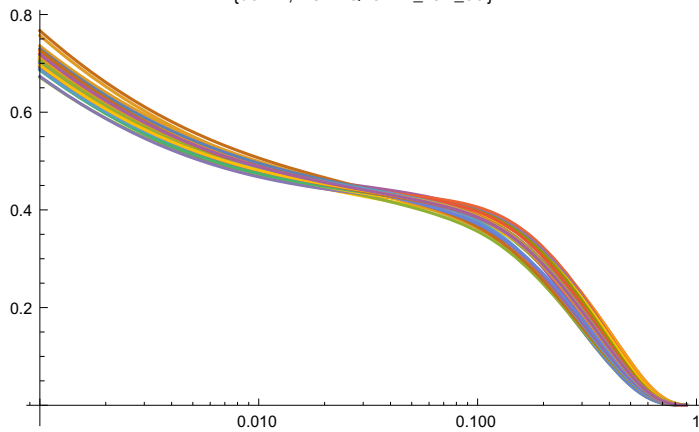
```
{down, nCTEQ15WZ_7_3}
```



```
index = 1209
```

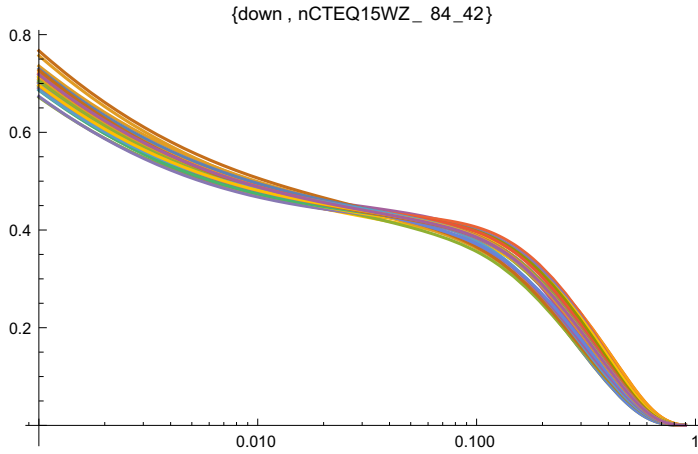
```
range = {1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182,
  1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195,
  1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209}
```

```
{down, nCTEQ15WZ_84_36}
```



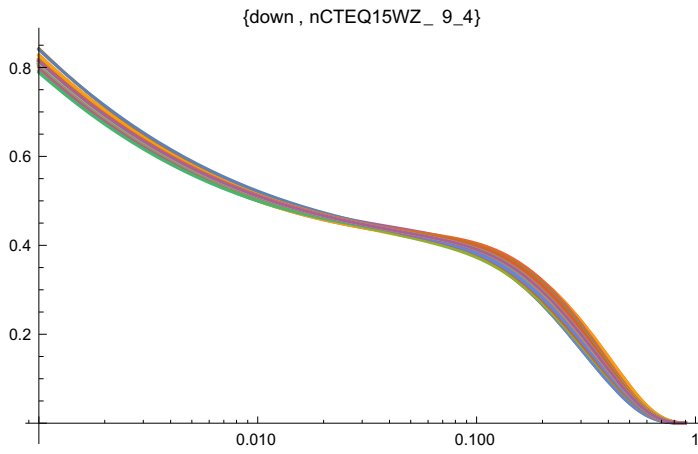
```
index = 1248
```

```
range = {1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221,
  1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234,
  1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248}
```



index = 1287

range = {1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287}



index = 1326

range = {1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326}

