
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
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Fred : 19 April 2021

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

Set Directory

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

```
In[ ]:= (* This just drops the leading path  
info to make the list of files easier to read *)  
dropPath = Take[(FileNameSplit /@ #) // Transpose, -1][[1]] &;  
  
In[ ]:= NotebookDirectory [];  
here = NotebookDirectory []  
  
Out[ ]:= /home/olness/Documents/TMP/nCTEQ15WZSIH_TESTING /  
  
In[ ]:= (* If there is a problem with the Mathematica working directory,  
you can enter it manually here *)  
SetDirectory[here]  
  
Out[ ]:= /home/olness/Documents/TMP/nCTEQ15WZSIH_TESTING  
  
In[ ]:= (* This shows what files should be in this main directory *)  
FileNames["*", here] // dropPath  
  
Out[ ]:= {LHAPDF, MP_packages, Read_nCTEQ15WZSIH.nb}
```

Setup Other Directories

```
In[ ]:= dirPackages = here <> "./MP_packages ";  
       FileNames["*", dirPackages] // dropPath
```

```
Out[ ]:= {pdfCalc.m, pdfErrors.m, pdfParseCTEQ.m, pdfParseLHA.m, README_V05.TXT}
```

```
In[ ]:= dirFilesLHA = "./LHAPDF";  
       dirList = Select[FileNames["nCTEQ15WZSIH*", dirFilesLHA], DirectoryQ];  
       dirList // dropPath
```

```
Out[ ]:= {nCTEQ15WZSIH_108_54, nCTEQ15WZSIH_1_1, nCTEQ15WZSIH_119_59, nCTEQ15WZSIH_12_6,  
          nCTEQ15WZSIH_131_54, nCTEQ15WZSIH_14_7, nCTEQ15WZSIH_16_8, nCTEQ15WZSIH_184_74,  
          nCTEQ15WZSIH_197_79, nCTEQ15WZSIH_197_98, nCTEQ15WZSIH_207_103, nCTEQ15WZSIH_208_82,  
          nCTEQ15WZSIH_2_1, nCTEQ15WZSIH_27_13, nCTEQ15WZSIH_3_1, nCTEQ15WZSIH_40_20,  
          nCTEQ15WZSIH_4_2, nCTEQ15WZSIH_56_26, nCTEQ15WZSIH_56_28, nCTEQ15WZSIH_6_3,  
          nCTEQ15WZSIH_64_32, nCTEQ15WZSIH_7_3, nCTEQ15WZSIH_84_42, nCTEQ15WZSIH_9_4}
```

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

```
Out[ ]:= 24
```

Load the package

Loading the main package provides many useful functions

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

```
Out[ ]:=
```

▼ pdfCalc`

pdfAlphaS

pdfFunction

pdfGetInfo

pdfGetXlist

pdfLuminosity

pdfReset

pdfSetList

pdfSetXpolarizer

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[ * ]:= 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/nCTEQ15WZSIH_108_54/nCTEQ15WZSIH_108_54.info.
Successfully read ./LHAPDF/nCTEQ15WZSIH_108_54/nCTEQ15WZSIH_108_54_0000.dat.
1
  i = 1
Successfully read ./LHAPDF/nCTEQ15WZSIH_1_1/nCTEQ15WZSIH_1_1.info.
Successfully read ./LHAPDF/nCTEQ15WZSIH_1_1/nCTEQ15WZSIH_1_1_0000.dat.
2
  i = 2
Successfully read ./LHAPDF/nCTEQ15WZSIH_119_59/nCTEQ15WZSIH_119_59.info.
Successfully read ./LHAPDF/nCTEQ15WZSIH_119_59/nCTEQ15WZSIH_119_59_0000.dat.
3
  i = 3
Successfully read ./LHAPDF/nCTEQ15WZSIH_12_6/nCTEQ15WZSIH_12_6.info.
Successfully read ./LHAPDF/nCTEQ15WZSIH_12_6/nCTEQ15WZSIH_12_6_0000.dat.
4
  i = 4
Successfully read ./LHAPDF/nCTEQ15WZSIH_131_54/nCTEQ15WZSIH_131_54.info.
Successfully read ./LHAPDF/nCTEQ15WZSIH_131_54/nCTEQ15WZSIH_131_54_0000.dat.
5
  i = 5
Successfully read ./LHAPDF/nCTEQ15WZSIH_14_7/nCTEQ15WZSIH_14_7.info.
Successfully read ./LHAPDF/nCTEQ15WZSIH_14_7/nCTEQ15WZSIH_14_7_0000.dat.
6
  i = 6

```

```

Successfully read ./LHAPDF/nCTEQ15WZSIH_ 16_8/nCTEQ15WZSIH_ 16_8.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 16_8/nCTEQ15WZSIH_ 16_8_0000.dat .
7
  i = 7
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 184_74/nCTEQ15WZSIH_ 184_74.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 184_74/nCTEQ15WZSIH_ 184_74_0000.dat .
8
  i = 8
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 197_79/nCTEQ15WZSIH_ 197_79.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 197_79/nCTEQ15WZSIH_ 197_79_0000.dat .
9
  i = 9
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 197_98/nCTEQ15WZSIH_ 197_98.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 197_98/nCTEQ15WZSIH_ 197_98_0000.dat .
10
  i = 10
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 207_103/nCTEQ15WZSIH_ 207_103.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 207_103/nCTEQ15WZSIH_ 207_103_0000.dat .
11
  i = 11
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 208_82/nCTEQ15WZSIH_ 208_82.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 208_82/nCTEQ15WZSIH_ 208_82_0000.dat .
12
  i = 12
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 2_1/nCTEQ15WZSIH_ 2_1.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 2_1/nCTEQ15WZSIH_ 2_1_0000.dat .
13
  i = 13
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 27_13/nCTEQ15WZSIH_ 27_13.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 27_13/nCTEQ15WZSIH_ 27_13_0000.dat .
14
  i = 14
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 3_1/nCTEQ15WZSIH_ 3_1.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 3_1/nCTEQ15WZSIH_ 3_1_0000.dat .
15
  i = 15

```

```

Successfully read ./LHAPDF/nCTEQ15WZSIH_ 40_20/nCTEQ15WZSIH_ 40_20.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 40_20/nCTEQ15WZSIH_ 40_20_0000.dat .
16
  i = 16
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 4_2/nCTEQ15WZSIH_ 4_2.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 4_2/nCTEQ15WZSIH_ 4_2_0000.dat .
17
  i = 17
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 56_26/nCTEQ15WZSIH_ 56_26.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 56_26/nCTEQ15WZSIH_ 56_26_0000.dat .
18
  i = 18
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 56_28/nCTEQ15WZSIH_ 56_28.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 56_28/nCTEQ15WZSIH_ 56_28_0000.dat .
19
  i = 19
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 6_3/nCTEQ15WZSIH_ 6_3.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 6_3/nCTEQ15WZSIH_ 6_3_0000.dat .
20
  i = 20
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 64_32/nCTEQ15WZSIH_ 64_32.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 64_32/nCTEQ15WZSIH_ 64_32_0000.dat .
21
  i = 21
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 7_3/nCTEQ15WZSIH_ 7_3.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 7_3/nCTEQ15WZSIH_ 7_3_0000.dat .
22
  i = 22
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 84_42/nCTEQ15WZSIH_ 84_42.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 84_42/nCTEQ15WZSIH_ 84_42_0000.dat .
23
  i = 23
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 9_4/nCTEQ15WZSIH_ 9_4.info .
Successfully read ./LHAPDF/nCTEQ15WZSIH_ 9_4/nCTEQ15WZSIH_ 9_4_0000.dat .
24
  i = 24

```

```
In[ * ]:= Length[dirList]
```

```
Out[ * ]:= 24
```

```
In[ * ]:= pdfSetListDisplay []
```

```
Out[ * ]:=
```

Set Number	File Name	Max Flavors	Valance Flavors
1	./LHAPDF/nCTEQ15WZSIH_108_54/nCTEQ15WZSIH_108_54_0000.dat	5	n/a
2	./LHAPDF/nCTEQ15WZSIH_1_1/nCTEQ15WZSIH_1_1_0000.dat	5	n/a
3	./LHAPDF/nCTEQ15WZSIH_119_59/nCTEQ15WZSIH_119_59_0000.dat	5	n/a
4	./LHAPDF/nCTEQ15WZSIH_12_6/nCTEQ15WZSIH_12_6_0000.dat	5	n/a
5	./LHAPDF/nCTEQ15WZSIH_131_54/nCTEQ15WZSIH_131_54_0000.dat	5	n/a
6	./LHAPDF/nCTEQ15WZSIH_14_7/nCTEQ15WZSIH_14_7_0000.dat	5	n/a
7	./LHAPDF/nCTEQ15WZSIH_16_8/nCTEQ15WZSIH_16_8_0000.dat	5	n/a
8	./LHAPDF/nCTEQ15WZSIH_184_74/nCTEQ15WZSIH_184_74_0000.dat	5	n/a
9	./LHAPDF/nCTEQ15WZSIH_197_79/nCTEQ15WZSIH_197_79_0000.dat	5	n/a
10	./LHAPDF/nCTEQ15WZSIH_197_98/nCTEQ15WZSIH_197_98_0000.dat	5	n/a
11	./LHAPDF/nCTEQ15WZSIH_207_103/nCTEQ15WZSIH_207_103_0000.dat	5	n/a
12	./LHAPDF/nCTEQ15WZSIH_208_82/nCTEQ15WZSIH_208_82_0000.dat	5	n/a
13	./LHAPDF/nCTEQ15WZSIH_2_1/nCTEQ15WZSIH_2_1_0000.dat	5	n/a
14	./LHAPDF/nCTEQ15WZSIH_27_13/nCTEQ15WZSIH_27_13_0000.dat	5	n/a
15	./LHAPDF/nCTEQ15WZSIH_3_1/nCTEQ15WZSIH_3_1_0000.dat	5	n/a
16	./LHAPDF/nCTEQ15WZSIH_40_20/nCTEQ15WZSIH_40_20_0000.dat	5	n/a
17	./LHAPDF/nCTEQ15WZSIH_4_2/nCTEQ15WZSIH_4_2_0000.dat	5	n/a
18	./LHAPDF/nCTEQ15WZSIH_56_26/nCTEQ15WZSIH_56_26_0000.dat	5	n/a

19	./LHAPDF/nCTEQ15WZSIH_56_28/nCTEQ15WZSIH_56_28_0000.dat	5	n/a
20	./LHAPDF/nCTEQ15WZSIH_6_3/nCTEQ15WZSIH_6_3_0000.dat	5	n/a
21	./LHAPDF/nCTEQ15WZSIH_64_32/nCTEQ15WZSIH_64_32_0000.dat	5	n/a
22	./LHAPDF/nCTEQ15WZSIH_7_3/nCTEQ15WZSIH_7_3_0000.dat	5	n/a
23	./LHAPDF/nCTEQ15WZSIH_84_42/nCTEQ15WZSIH_84_42_0000.dat	5	n/a
24	./LHAPDF/nCTEQ15WZSIH_9_4/nCTEQ15WZSIH_9_4_0000.dat	5	n/a

Define PDF

```

In[ * ]:= pdf[x__] := pdfFunction[x]
      SetAttributes[pdf, Listable]

In[ * ]:= Clear[dropPath]

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

Out[ * ]:= Last[FileNameSplit [##]] &

```

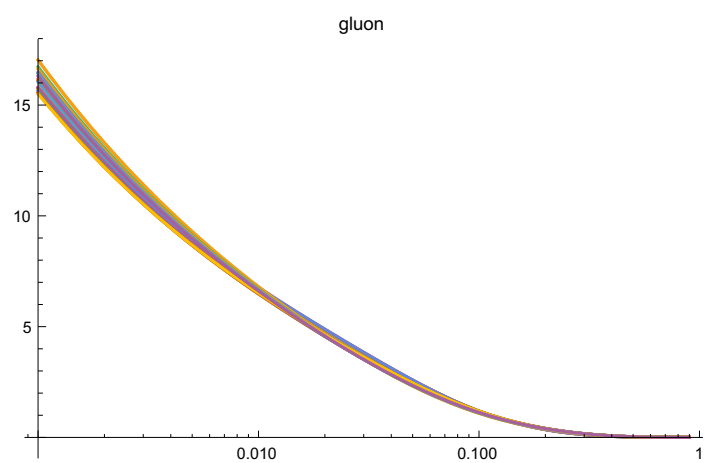
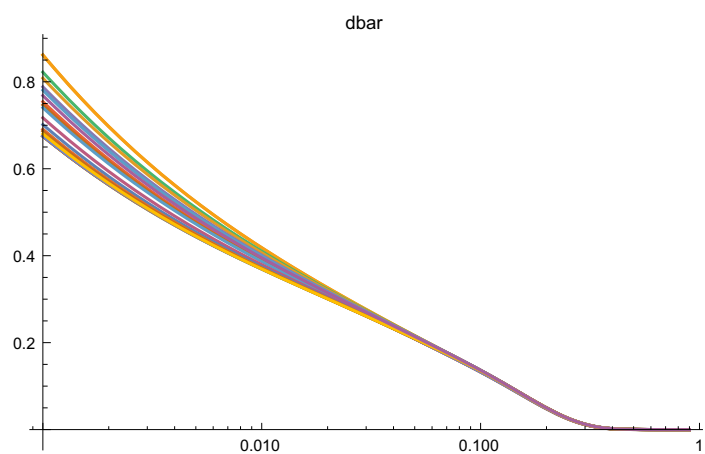
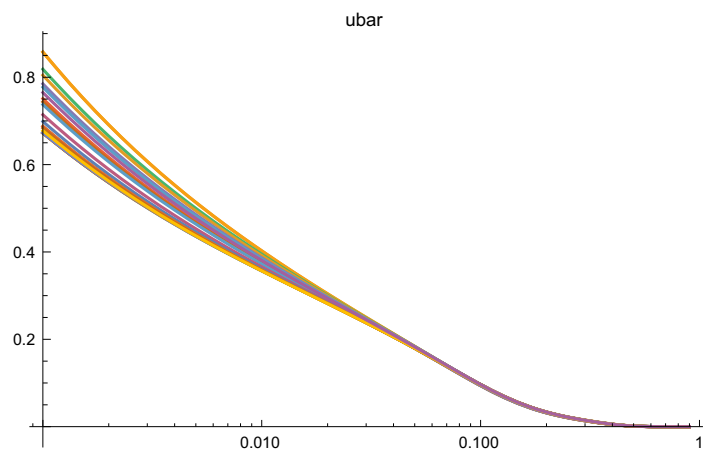
Look at PDFs:

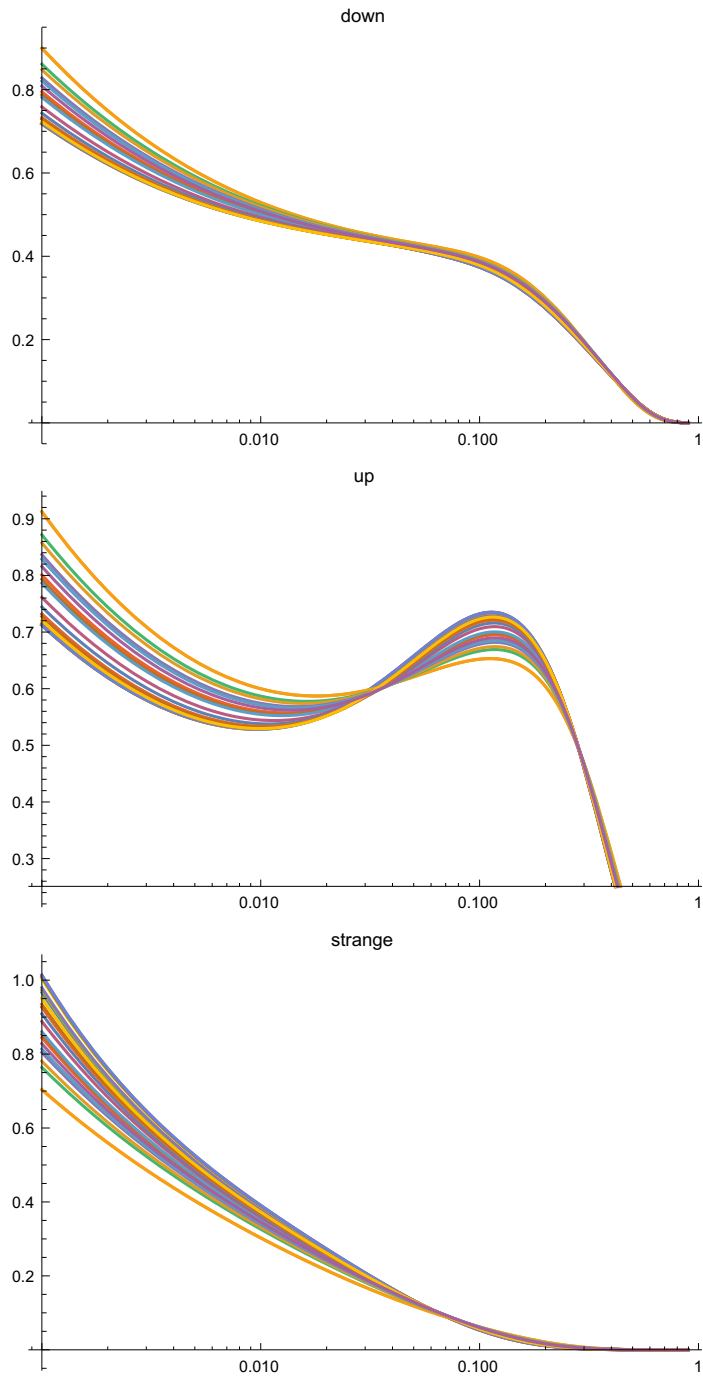
```

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

In[ * ]:= 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[] := **dirLen = Length[dirList]**

Out[] := 24

```

In[ ]:= 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/nCTEQ15WZSIH_108_54/nCTEQ15WZSIH_108_54.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/nCTEQ15WZSIH_1_1/nCTEQ15WZSIH_1_1.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/nCTEQ15WZSIH_119_59/nCTEQ15WZSIH_119_59.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/nCTEQ15WZSIH_12_6/nCTEQ15WZSIH_12_6.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/nCTEQ15WZSIH_131_54/nCTEQ15WZSIH_131_54.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/nCTEQ15WZSIH_14_7/nCTEQ15WZSIH_14_7.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/nCTEQ15WZSIH_16_8/nCTEQ15WZSIH_16_8.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/nCTEQ15WZSIH_184_74/nCTEQ15WZSIH_184_74.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/nCTEQ15WZSIH_197_79/nCTEQ15WZSIH_197_79.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/nCTEQ15WZSIH_197_98/nCTEQ15WZSIH_197_98.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/nCTEQ15WZSIH_207_103/nCTEQ15WZSIH_207_103.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/nCTEQ15WZSIH_208_82/nCTEQ15WZSIH_208_82.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/nCTEQ15WZSIH_ 2_1/nCTEQ15WZSIH_ 2_1.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/nCTEQ15WZSIH_ 27_13/nCTEQ15WZSIH_ 27_13.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/nCTEQ15WZSIH_ 3_1/nCTEQ15WZSIH_ 3_1.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/nCTEQ15WZSIH_ 40_20/nCTEQ15WZSIH_ 40_20.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/nCTEQ15WZSIH_ 4_2/nCTEQ15WZSIH_ 4_2.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/nCTEQ15WZSIH_ 56_26/nCTEQ15WZSIH_ 56_26.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/nCTEQ15WZSIH_ 56_28/nCTEQ15WZSIH_ 56_28.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/nCTEQ15WZSIH_6_3/nCTEQ15WZSIH_6_3.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/nCTEQ15WZSIH_64_32/nCTEQ15WZSIH_64_32.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/nCTEQ15WZSIH_7_3/nCTEQ15WZSIH_7_3.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/nCTEQ15WZSIH_84_42/nCTEQ15WZSIH_84_42.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/nCTEQ15WZSIH_9_4/nCTEQ15WZSIH_9_4.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

```

Look at PDFs

```
lnf * ]:= q0 = 10;  
x0 = 0.1;  
ipart0 = 1;  
len = Length[pdfSetList]
```

Out[•]= 936

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

Out[•]= 24

```
ln[ • ]:= pdf[Range[len], 0, 0.1, 10]
```

[illegible]

11.5448, 11.3193, 11.3934, 11.4649, 11.3963, 11.457, 11.8525, 12.2333, 12.0563,
 11.8736, 11.869, 12.14, 12.0405, 11.8229, 11.8603, 11.9246, 11.8797, 11.8622,
 11.8679, 12.0141, 12.168, 12.1199, 12.1369, 12.142, 11.7427, 11.9079, 12.0994,
 11.9303, 12.1932, 12.0309, 11.9184, 11.9411, 11.7401, 11.8937, 11.7746, 11.7478,
 11.9534, 12.0368, 11.6488, 12.0099, 11.7022, 11.8396, 11.8652, 11.5455, 12.1464,
 11.8422, 12.2652, 12.0538, 11.865, 11.8594, 12.1454, 12.0538, 11.8136, 11.8494,
 11.9165, 11.8754, 11.8504, 11.8596, 12.0293, 12.1714, 12.1235, 12.1572, 12.1424,
 11.7358, 11.9168, 12.0856, 11.9263, 12.2253, 12.0463, 11.9107, 11.9552, 11.711,
 11.8942, 11.7485, 11.7307, 11.9727, 12.0359, 11.6275, 11.9911, 11.6984, 11.8354,
 11.8474, 11.5136, 12.1565, 11.8422, 12.2652, 12.0538, 11.865, 11.8594, 12.1454,
 12.0538, 11.8136, 11.8494, 11.9165, 11.8754, 11.8504, 11.8596, 12.0293, 12.1714,
 12.1235, 12.1572, 12.1424, 11.7358, 11.9168, 12.0856, 11.9263, 12.2253, 12.0463,
 11.9107, 11.9552, 11.711, 11.8942, 11.7485, 11.7307, 11.9727, 12.0359, 11.6275,
 11.9911, 11.6984, 11.8354, 11.8474, 11.5136, 12.1565, 11.8331, 12.2901, 12.0495,
 11.8571, 11.8511, 12.1481, 12.0636, 11.8054, 11.8399, 11.9088, 11.8713, 11.8401,
 11.8523, 12.0405, 12.1725, 12.1247, 12.1722, 12.1411, 11.7299, 11.9228, 12.0731,
 11.9217, 12.2506, 12.0582, 11.9032, 11.9661, 11.6867, 11.8941, 11.7267, 11.7148,
 11.9886, 12.0342, 11.6101, 11.9754, 11.6945, 11.8312, 11.8325, 11.4881, 12.1632,
 11.8322, 12.2926, 12.049, 11.8563, 11.8502, 12.1483, 12.0645, 11.8045, 11.8389,
 11.908, 11.8708, 11.8391, 11.8515, 12.0416, 12.1725, 12.1248, 12.1736, 12.1409,
 11.7293, 11.9234, 12.0718, 11.9211, 12.2532, 12.0594, 11.9024, 11.9672, 11.6842,
 11.8941, 11.7245, 11.7131, 11.9902, 12.034, 11.6083, 11.9738, 11.6941, 11.8308,
 11.831, 11.4855, 12.1638, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786,
 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786,
 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786,
 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 10.8786, 11.5645, 11.6257, 11.5737,
 11.5567, 11.5806, 11.6144, 11.5723, 11.5406, 11.5692, 11.5665, 11.5623, 11.5725,
 11.5694, 11.5256, 11.6518, 11.6154, 11.5734, 11.6515, 11.4992, 11.4949, 11.694,
 11.5567, 11.5902, 11.5662, 11.5698, 11.5301, 11.5687, 11.5468, 11.5804, 11.4127,
 11.6816, 11.619, 11.5055, 11.7123, 11.4308, 11.5224, 11.6139, 11.5159, 11.6138,
 11.0542, 11.0682, 11.0454, 11.0436, 11.0663, 11.0526, 11.0624, 11.0489, 11.0565,
 11.0483, 11.0577, 11.0583, 11.0536, 11.0377, 11.0717, 11.058, 11.0529, 11.0635,
 11.0461, 11.049, 11.0628, 11.0555, 11.051, 11.0515, 11.0558, 11.0584, 11.0465,
 11.0424, 11.0672, 11.0006, 11.1248, 11.064, 11.0434, 11.0907, 11.0214, 11.0467,
 11.0632, 11.0493, 11.0594, 11.6673, 11.743, 11.697, 11.6622, 11.6835, 11.7416,
 11.6791, 11.6398, 11.6733, 11.6779, 11.6636, 11.6771, 11.6723, 11.6327, 11.7806,
 11.7411, 11.6882, 11.7808, 11.587, 11.5907, 11.8294, 11.6631, 11.7072, 11.6748,
 11.6771, 11.6264, 11.6708, 11.6485, 11.6827, 11.5153, 11.7574, 11.7362, 11.5928,
 11.8359, 11.5149, 11.6196, 11.7232, 11.5977, 11.7373, 11.1086, 11.1274, 11.0977,
 11.0968, 11.1222, 11.1087, 11.1177, 11.1014, 11.1108, 11.1009, 11.1126, 11.113,
 11.1089, 11.088, 11.1313, 11.114, 11.1074, 11.1229, 11.0961, 11.0967, 11.1263,
 11.1086, 11.1065, 11.1051, 11.1105, 11.1102, 11.1015, 11.0958, 11.1224, 11.0394,

```

11.1963, 11.1219, 11.0937, 11.1569, 11.0651, 11.0978, 11.1213, 11.1014, 11.116,
11.7487, 11.8435, 11.8036, 11.7467, 11.7647, 11.8506, 11.7693, 11.7185, 11.7557,
11.7691, 11.7446, 11.76, 11.7536, 11.7244, 11.8903, 11.8482, 11.7885, 11.8896,
11.6553, 11.6723, 11.9395, 11.7514, 11.8077, 11.7652, 11.7648, 11.706, 11.7481,
11.7302, 11.7615, 11.6044, 11.8072, 11.8328, 11.6575, 11.9321, 11.5827, 11.6982,
11.8078, 11.6534, 11.8433, 11.7487, 11.8435, 11.8036, 11.7467, 11.7647, 11.8506,
11.7693, 11.7185, 11.7557, 11.7691, 11.7446, 11.76, 11.7536, 11.7244, 11.8903,
11.8482, 11.7885, 11.8896, 11.6553, 11.6723, 11.9395, 11.7514, 11.8077, 11.7652,
11.7648, 11.706, 11.7481, 11.7302, 11.7615, 11.6044, 11.8072, 11.8328, 11.6575,
11.9321, 11.5827, 11.6982, 11.8078, 11.6534, 11.8433, 11.1919, 11.2181,
11.1792, 11.1797, 11.2068, 11.1963, 11.2014, 11.1819, 11.1942, 11.1828,
11.1958, 11.1967, 11.1937, 11.1658, 11.2231, 11.2011, 11.191, 11.2156, 11.1717,
11.1689, 11.2262, 11.1897, 11.1928, 11.1879, 11.194, 11.188, 11.1869, 11.1783,
11.2063, 11.1005, 11.3011, 11.2113, 11.1705, 11.2587, 11.1318, 11.1757,
11.2111, 11.1805, 11.2037, 11.7777, 11.8836, 11.845, 11.7773, 11.7936, 11.8929,
11.8042, 11.7467, 11.7852, 11.8028, 11.7739, 11.7896, 11.7827, 11.7602,
11.9325, 11.8895, 11.8284, 11.9311, 11.6793, 11.7039, 11.9799, 11.7845,
11.8474, 11.7996, 11.7973, 11.7362, 11.7741, 11.76, 11.7885, 11.6385, 11.823,
11.8689, 11.6788, 11.9657, 11.6075, 11.727, 11.837, 11.6696, 11.8846, 11.2257,
11.255, 11.2128, 11.2136, 11.241, 11.2325, 11.2351, 11.2145, 11.2281, 11.2165,
11.2294, 11.2307, 11.228, 11.1975, 11.2607, 11.2369, 11.225, 11.2537, 11.2021,
11.1981, 11.2673, 11.2225, 11.2281, 11.2217, 11.2279, 11.2193, 11.2217,
11.2118, 11.2403, 11.126, 11.3417, 11.2477, 11.2016, 11.3001, 11.1588, 11.2072,
11.2477, 11.2123, 11.2396, 11.8279, 11.9639, 11.9247, 11.8314, 11.8435, 11.975,
11.8724, 11.7956, 11.8362, 11.8638, 11.826, 11.841, 11.8335, 11.8312, 12.0139,
11.969, 11.9091, 12.0096, 11.7204, 11.7657, 12.0518, 11.8461, 11.9279, 11.8659,
11.8564, 11.7943, 11.8143, 11.8142, 11.8314, 11.7022, 11.8495, 11.9358, 11.7105,
12.0217, 11.6521, 11.7791, 11.885, 11.6876, 11.9654, 11.2835, 11.3178, 11.2709,
11.2716, 11.299, 11.2948, 11.2924, 11.27, 11.286, 11.2745, 11.2864, 11.2887,
11.2865, 11.2521, 11.3251, 11.2988, 11.2831, 11.3194, 11.2535, 11.2479, 11.3381,
11.2786, 11.2886, 11.2796, 11.2857, 11.2724, 11.2812, 11.2691, 11.2983, 11.1706,
11.4085, 11.3101, 11.2543, 11.3706, 11.2049, 11.2609, 11.3102, 11.2662, 11.3013}

```

```

In[ ]:= (* 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
```

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

```
Out[ ]:= {11.8596, 12.0403, 11.9887, 11.8678, 11.8748, 12.043, 11.9311,
  11.8268, 11.8683, 11.9069, 11.8617, 11.8731, 11.8664, 11.8933, 12.0803,
  12.0338, 11.9827, 12.0716, 11.7457, 11.8183, 12.0998, 11.8924, 12.0032,
  11.9218, 11.8987, 11.8435, 11.8295, 11.8538, 11.8501, 11.7478, 11.8714,
  11.9864, 11.7209, 12.0521, 11.6836, 11.8162, 11.9098, 11.6797, 12.034}
```

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

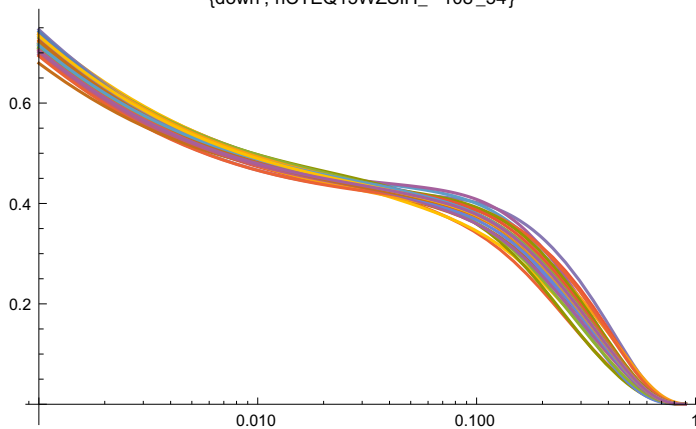
```
Out[ ]:= 24
```

```
In[ ]:= 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
```

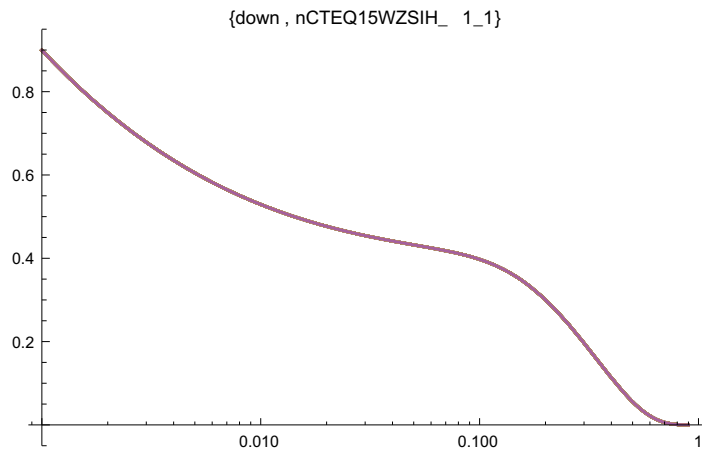
```
range = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19,
  20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39}
```

```
{down, nCTEQ15WZSIH_ 108_54}
```



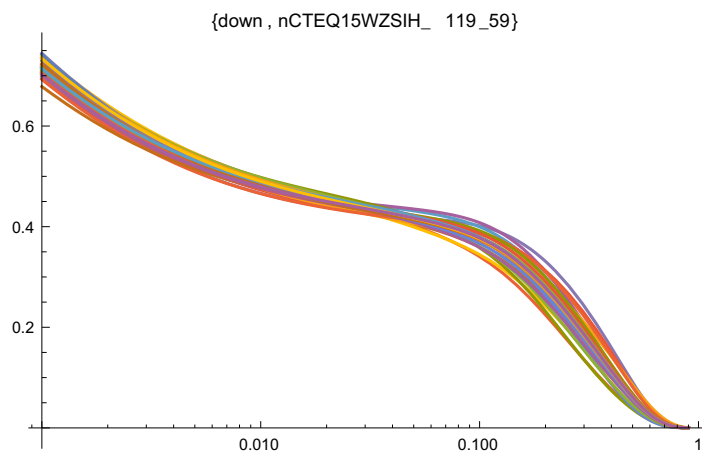
```
index = 78
```

```
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}
```



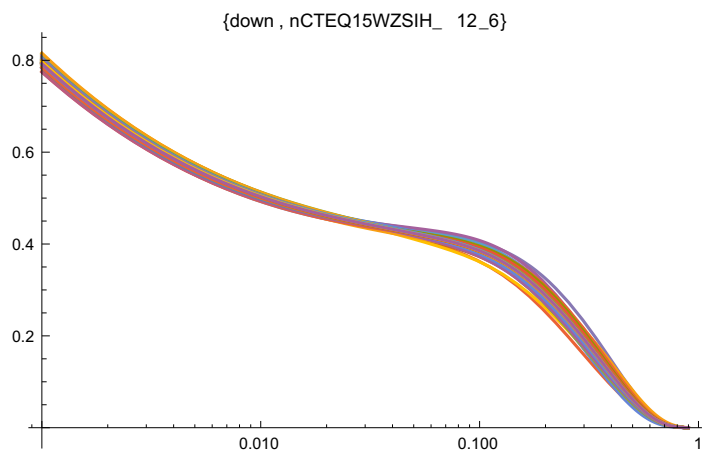
index = 117

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

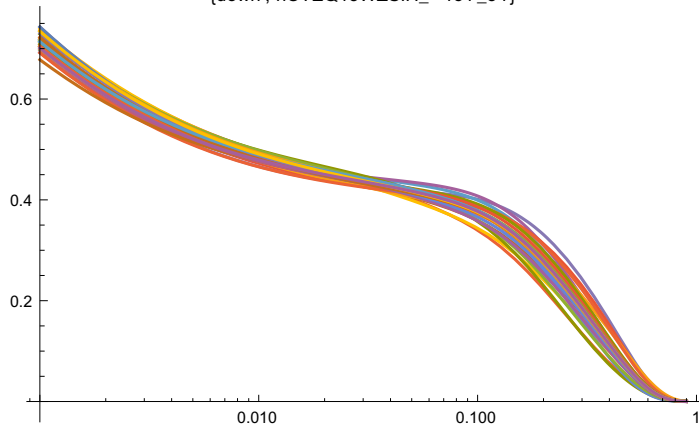
range = {118, 119, 120, 121, 122, 123, 124, 125, 126,
127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141,
142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156}



```
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}
```

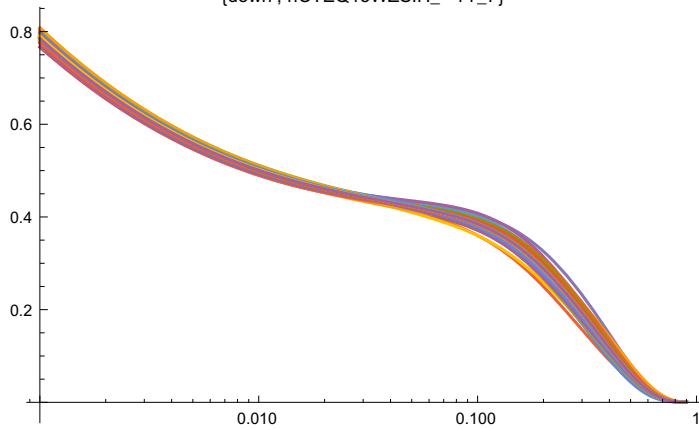
```
{down, nCTEQ15WZSIH_ 131_54}
```



```
index = 234
```

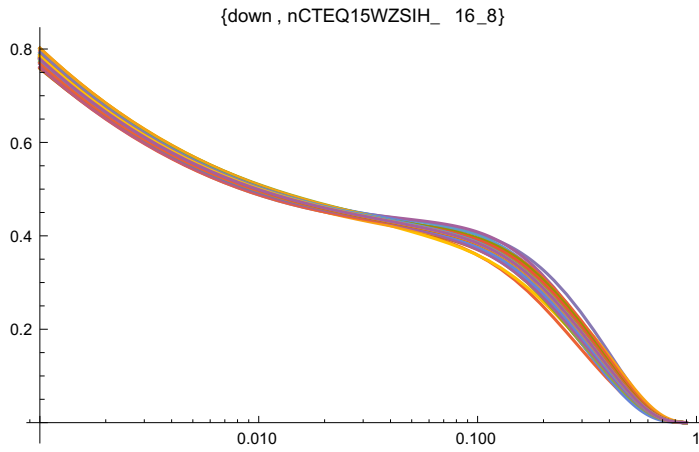
```
range = {196, 197, 198, 199, 200, 201, 202, 203, 204,
  205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219,
  220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234}
```

```
{down, nCTEQ15WZSIH_ 14_7}
```



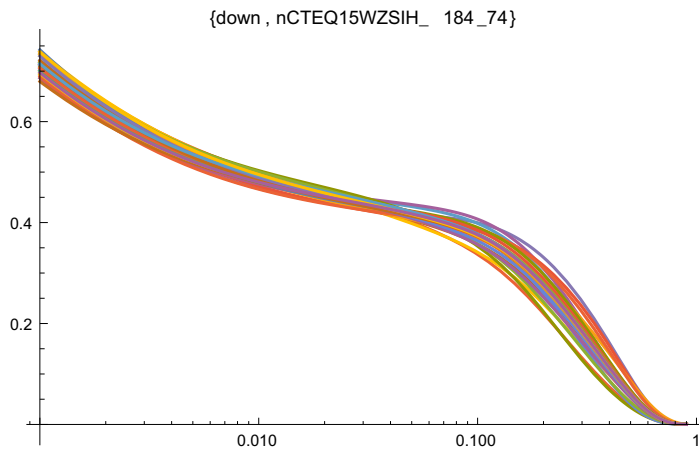
```
index = 273
```

```
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}
```



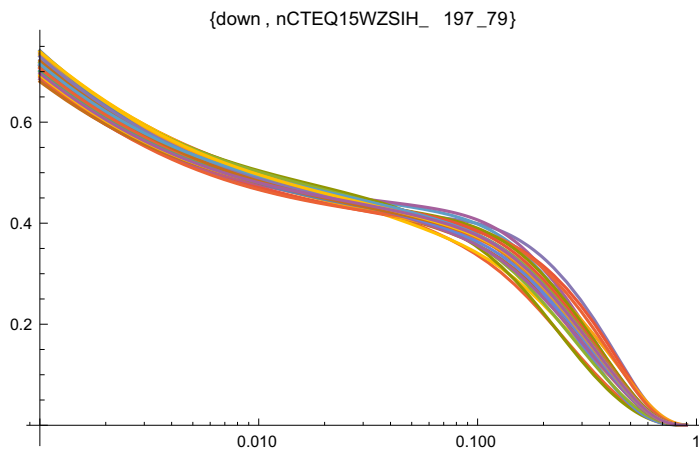
index = 312

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

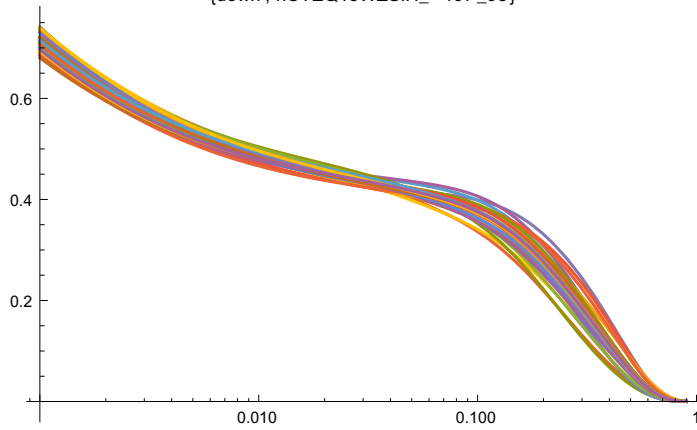
range = {313, 314, 315, 316, 317, 318, 319, 320, 321,
322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336,
337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351}



```
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}
```

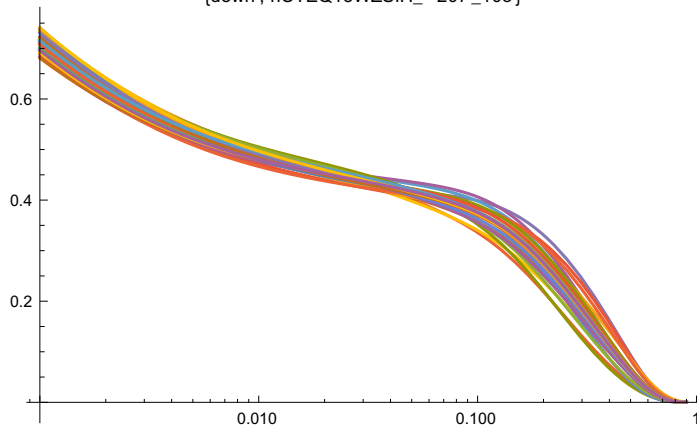
```
{down, nCTEQ15WZSIH_ 197_98}
```



```
index = 429
```

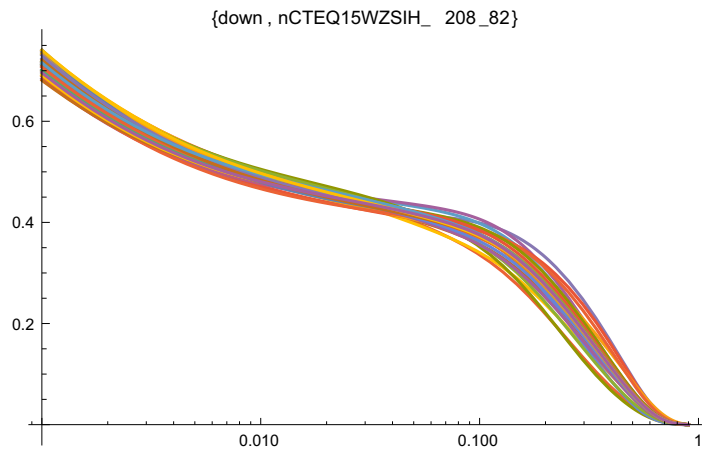
```
range = {391, 392, 393, 394, 395, 396, 397, 398, 399,
  400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414,
  415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429}
```

```
{down, nCTEQ15WZSIH_ 207_103}
```



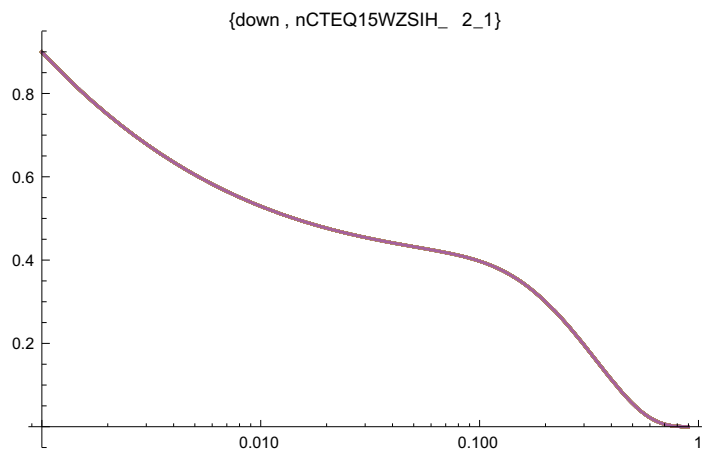
```
index = 468
```

```
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}
```



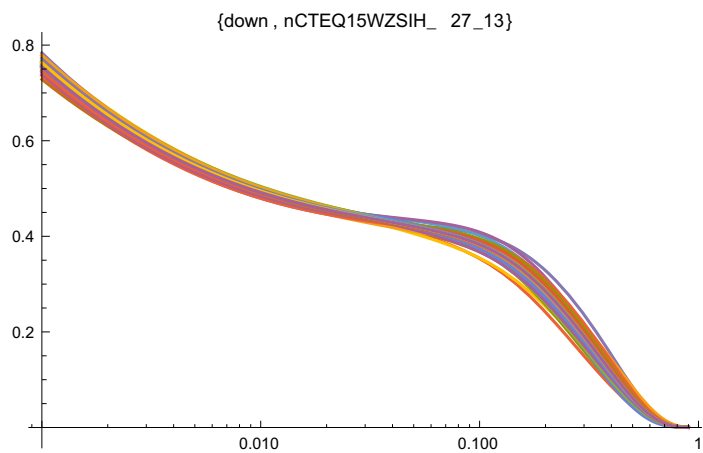
index = 507

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

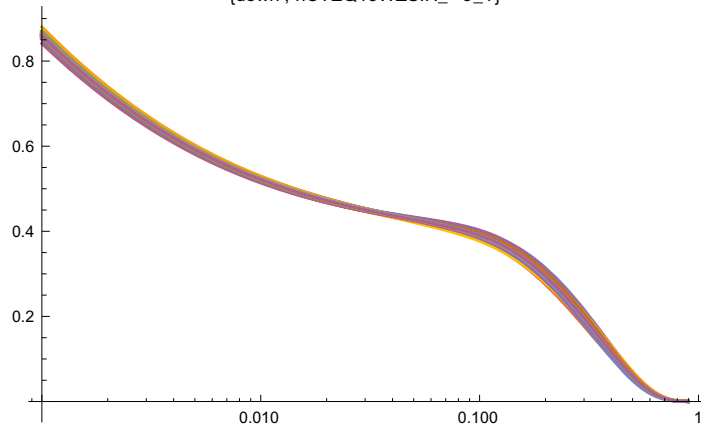
range = {508, 509, 510, 511, 512, 513, 514, 515, 516,
517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531,
532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546}



```
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}
```

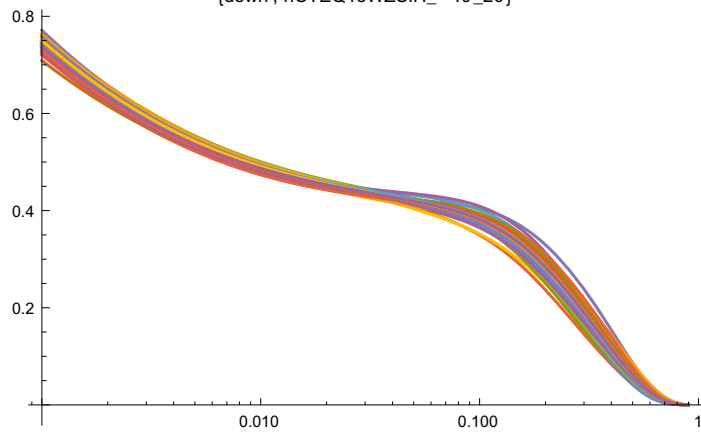
```
{down, nCTEQ15WZSIH_ 3_1}
```



```
index = 624
```

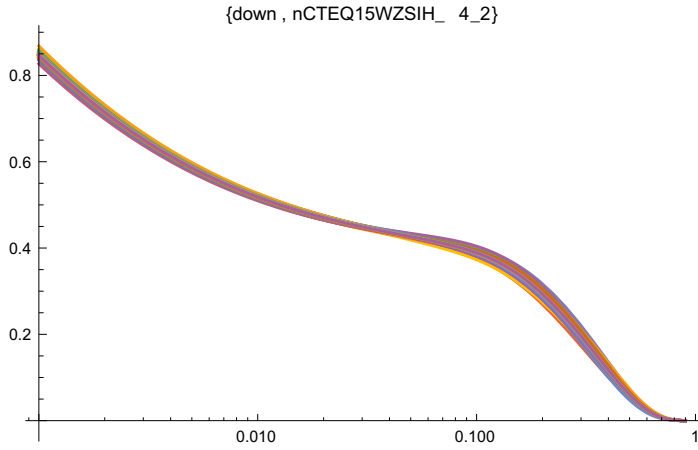
```
range = {586, 587, 588, 589, 590, 591, 592, 593, 594,
  595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609,
  610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624}
```

```
{down, nCTEQ15WZSIH_ 40_20}
```



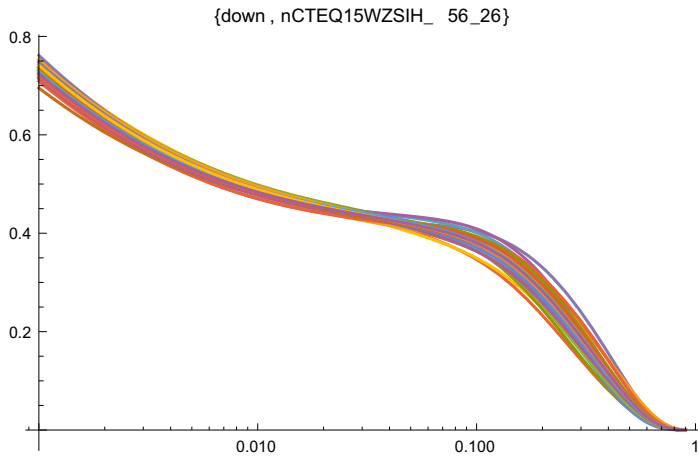
```
index = 663
```

```
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}
```



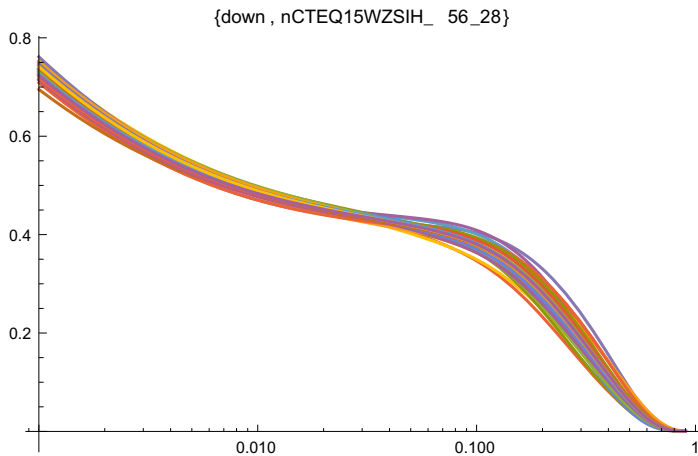
index = 702

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

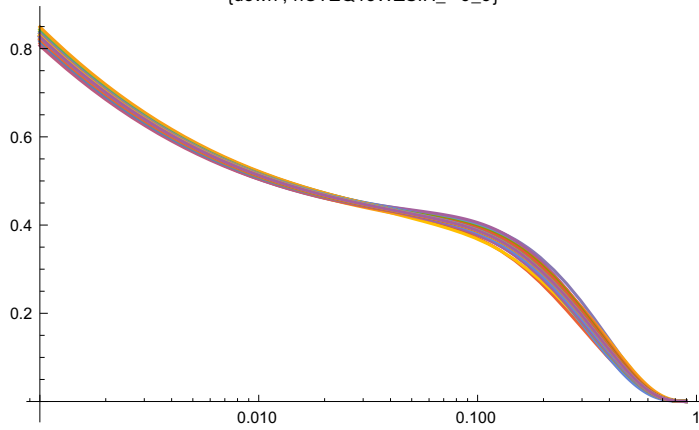
range = {703, 704, 705, 706, 707, 708, 709, 710, 711,
712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726,
727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741}



```
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}
```

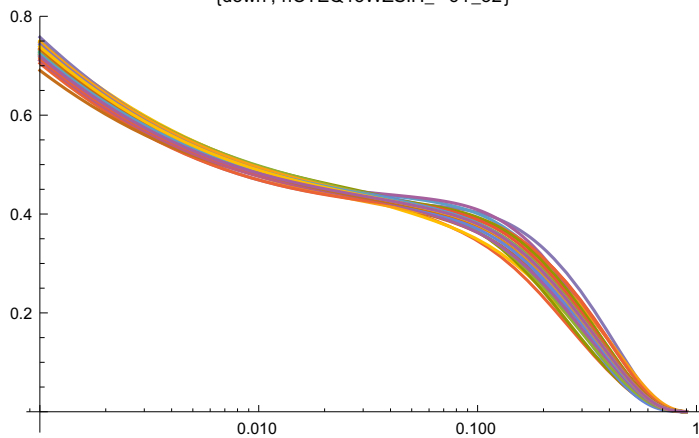
```
{down, nCTEQ15WZSIH_ 6_3}
```



```
index = 819
```

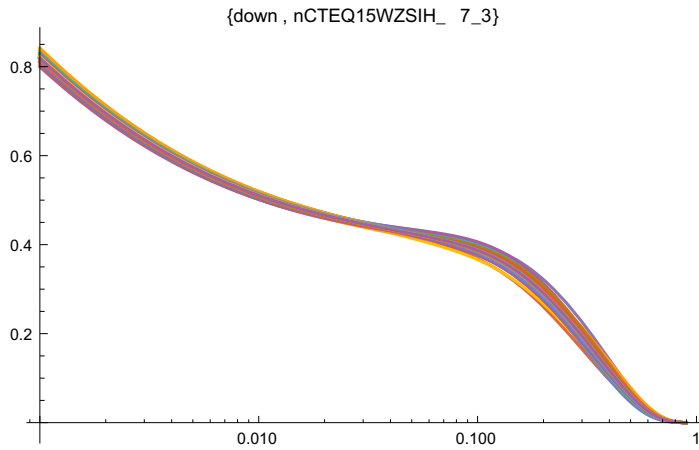
```
range = {781, 782, 783, 784, 785, 786, 787, 788, 789,
  790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804,
  805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819}
```

```
{down, nCTEQ15WZSIH_ 64_32}
```



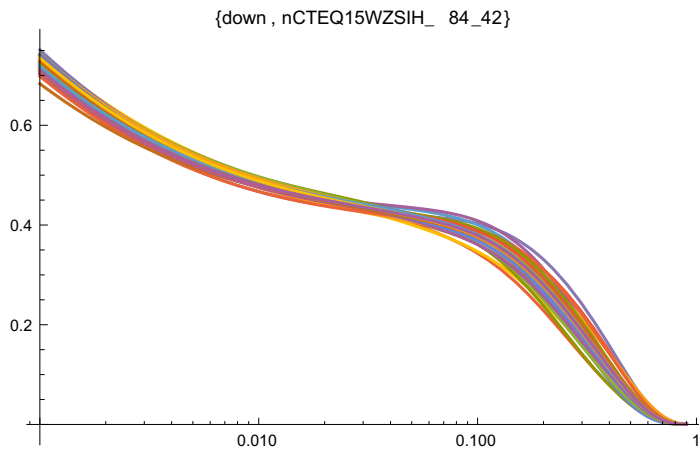
```
index = 858
```

```
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}

