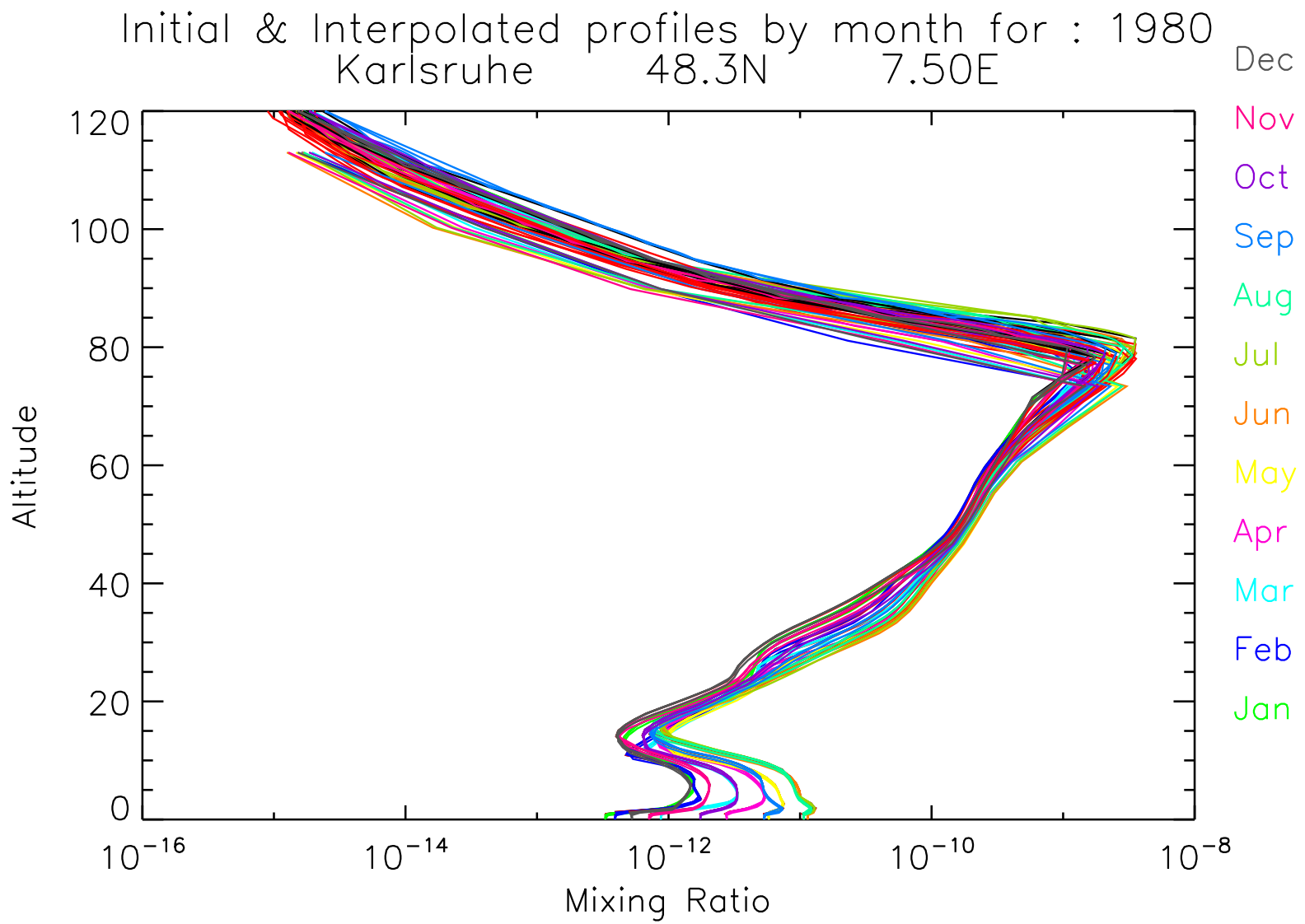
Initial & Interpolated profiles by month for : 1980
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
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Jun
May
Apr
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Feb
Jan
120
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20
0
Altitude
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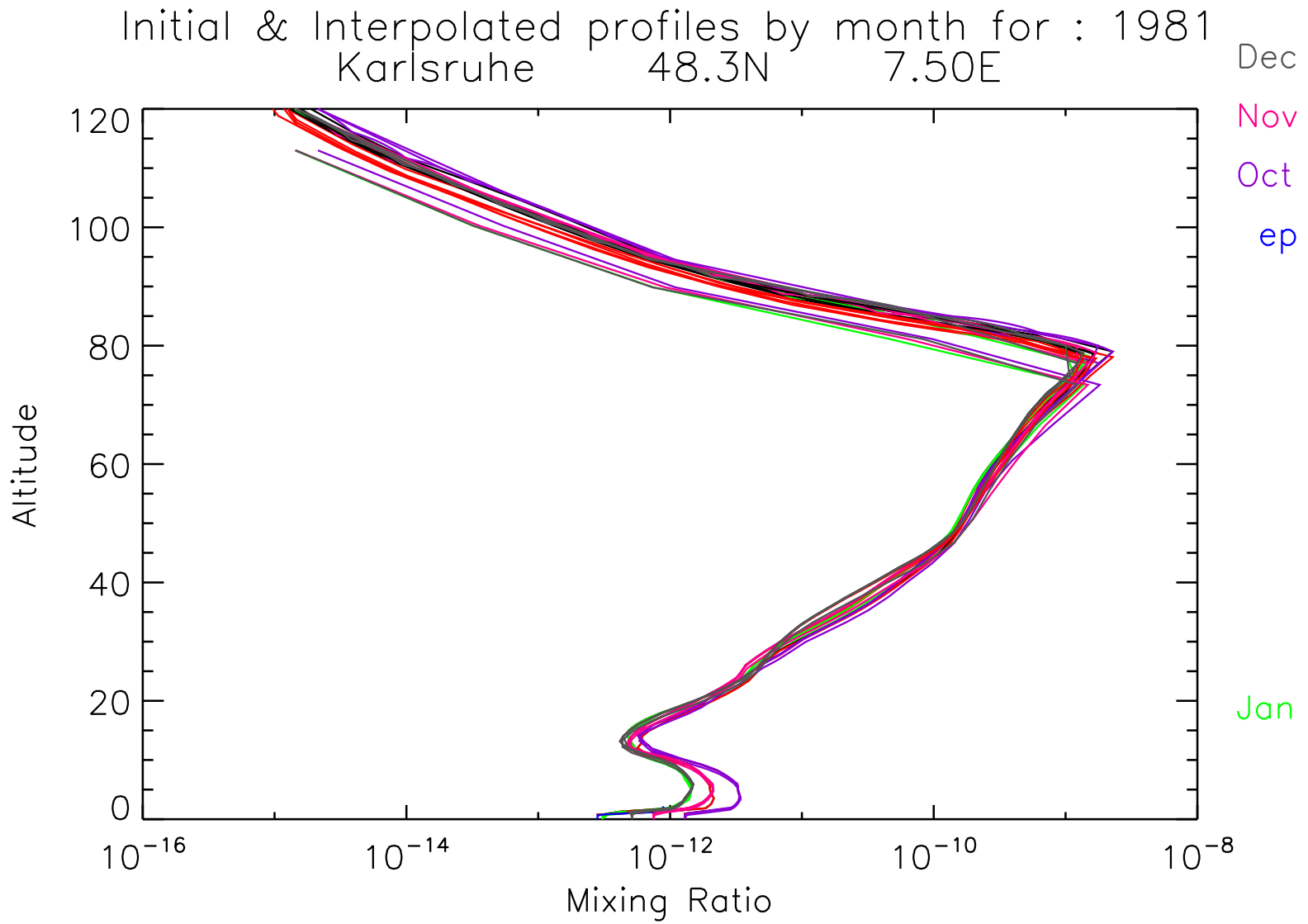
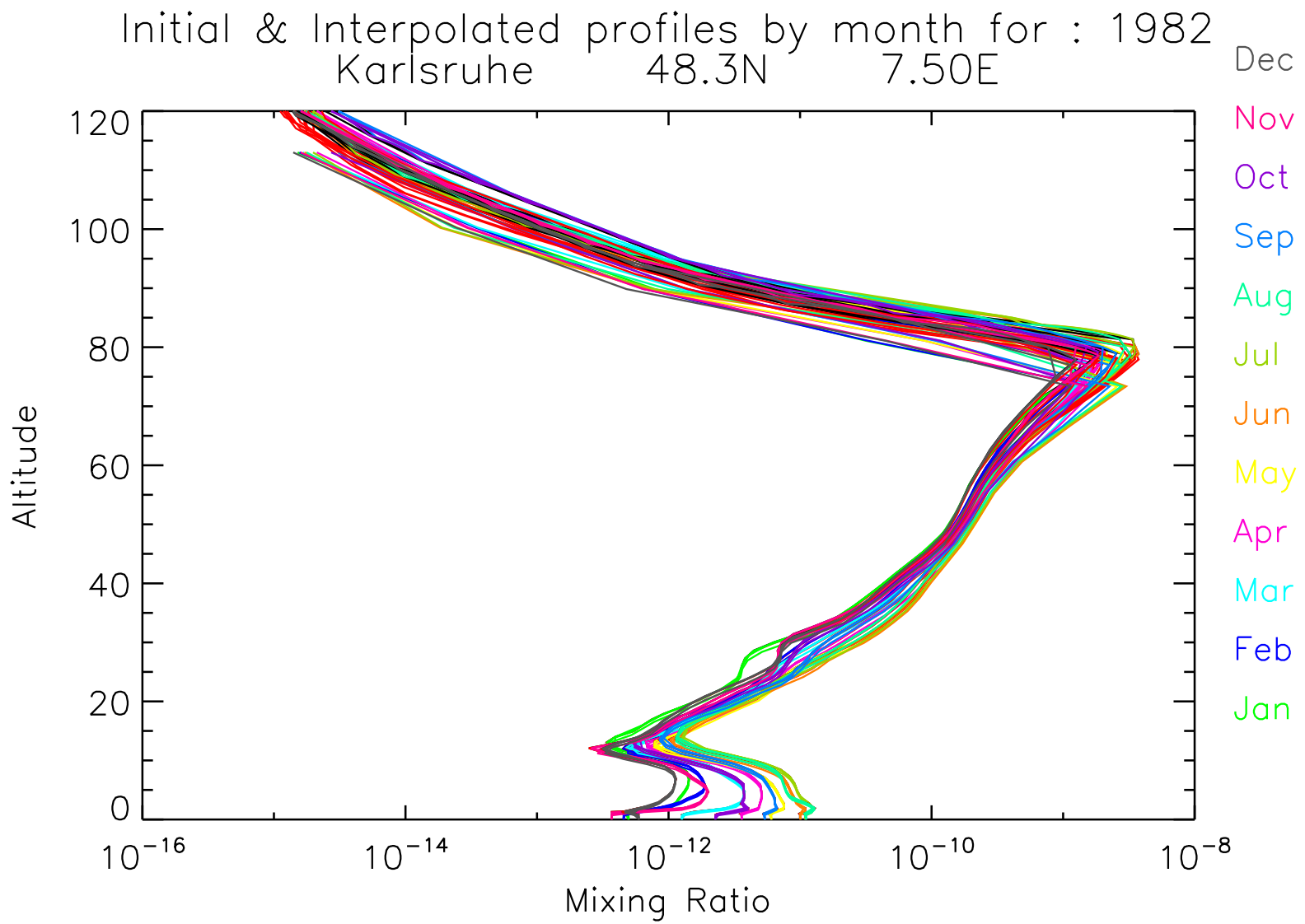
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1981
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
ep
Jan
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1982
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
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80
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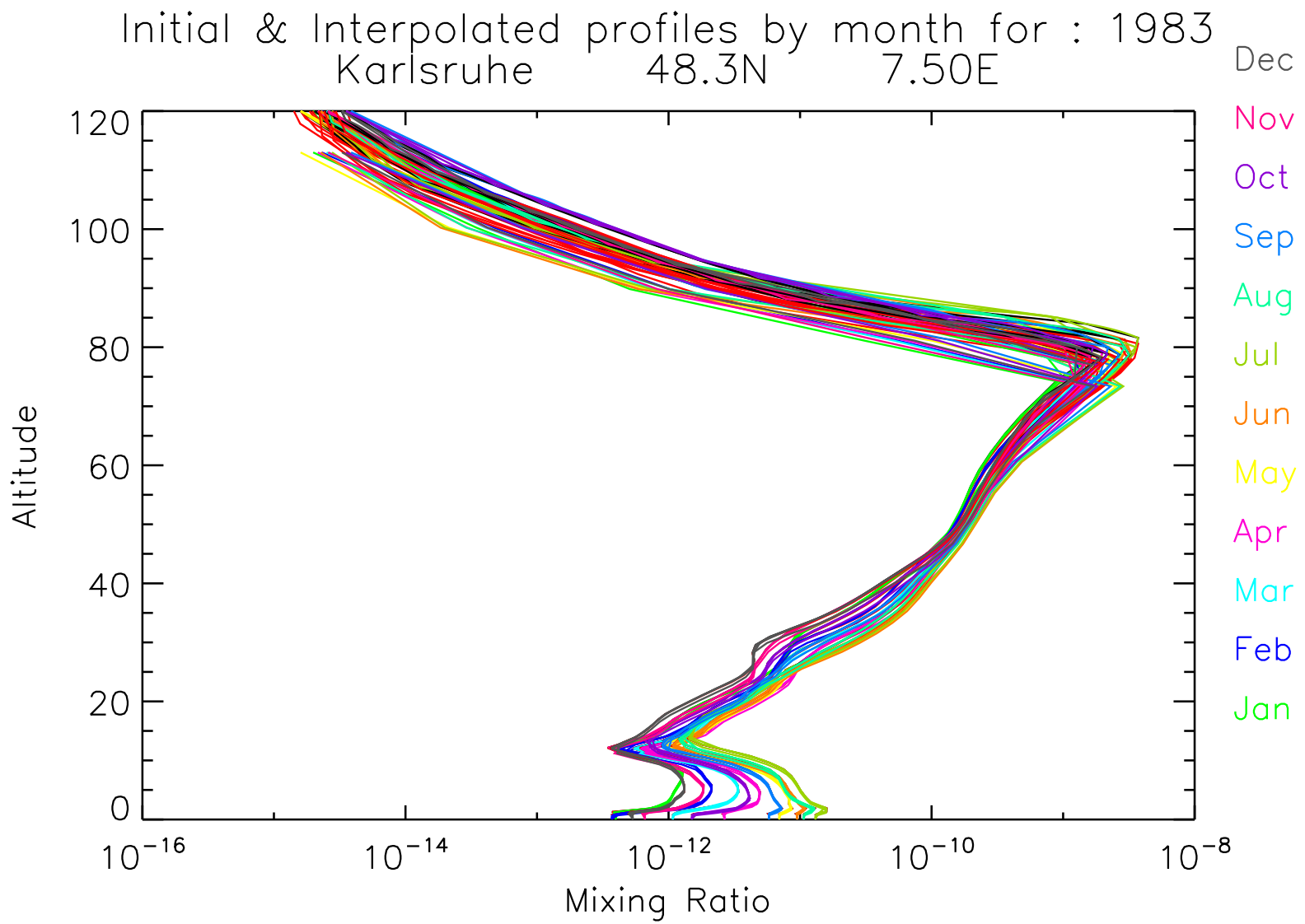
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1983
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
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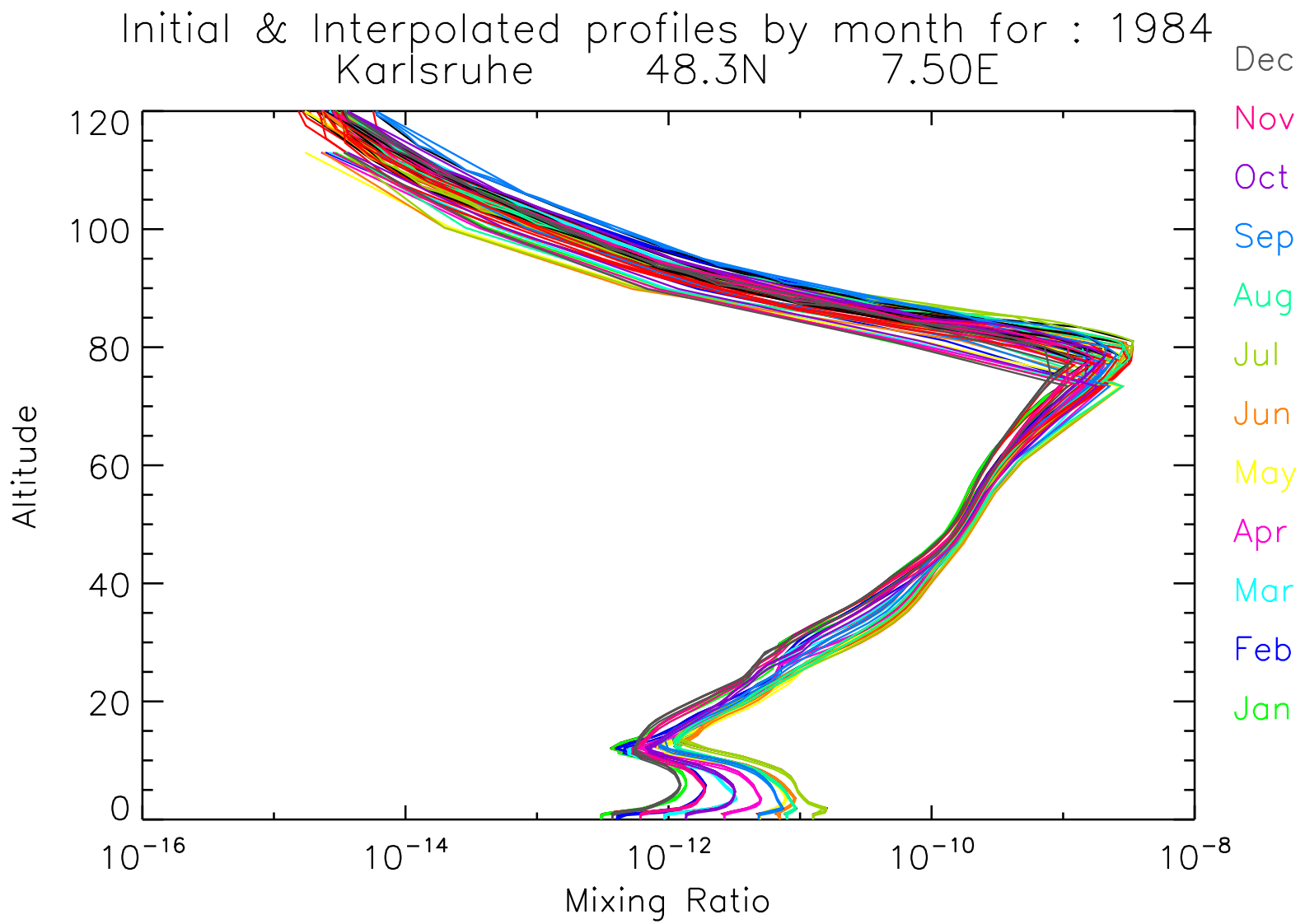
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1984
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
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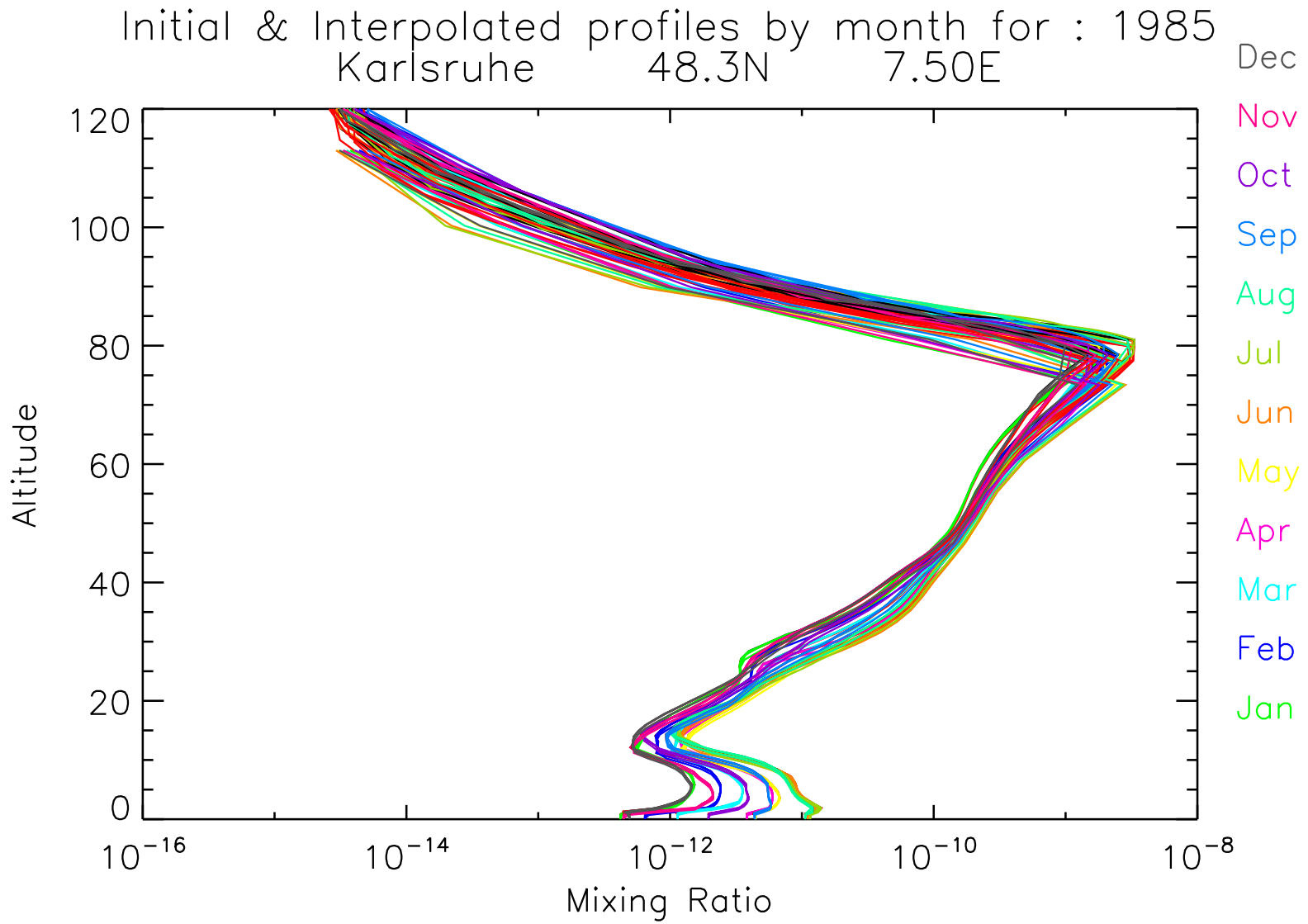
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1985
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
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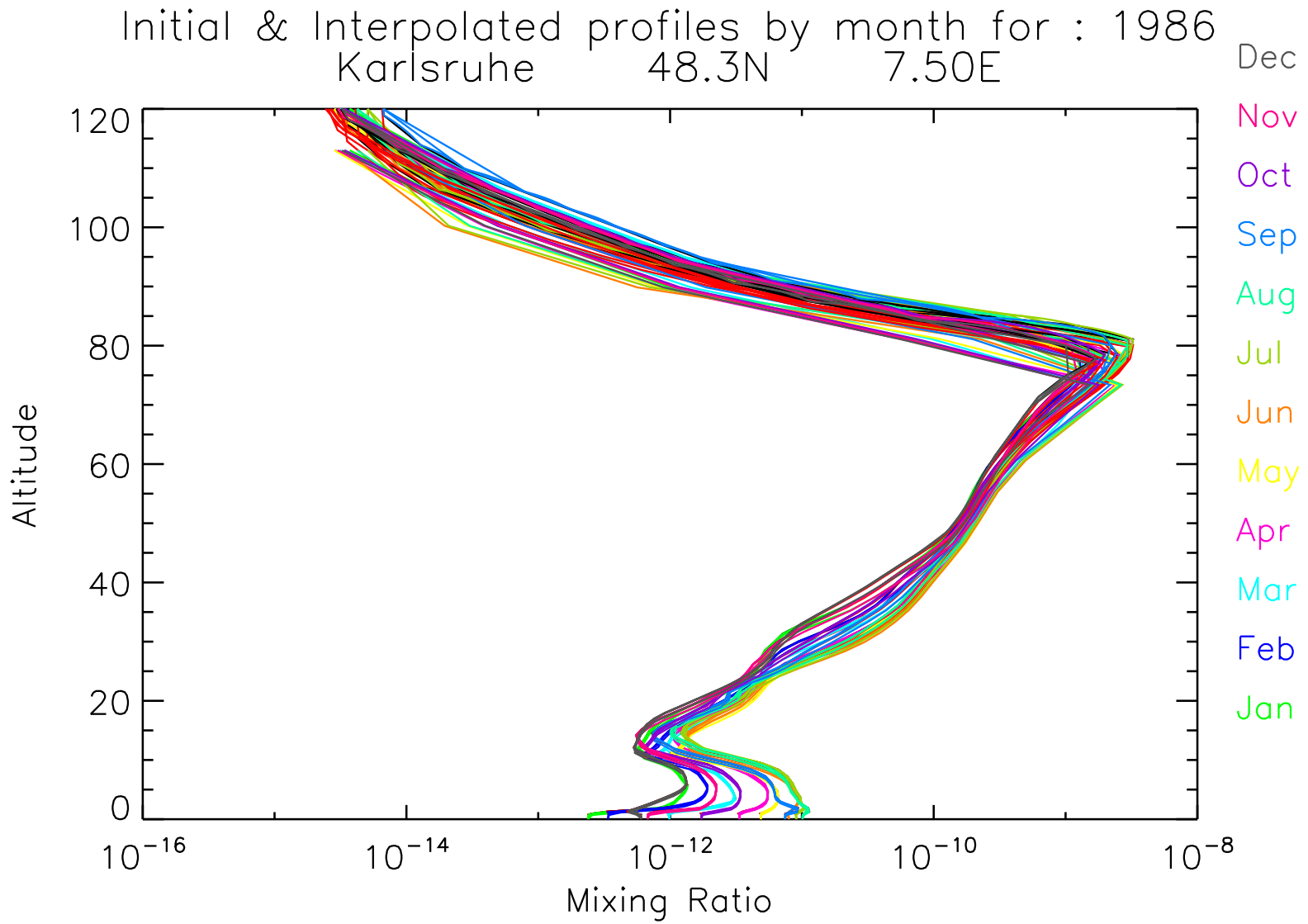
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1986
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
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40
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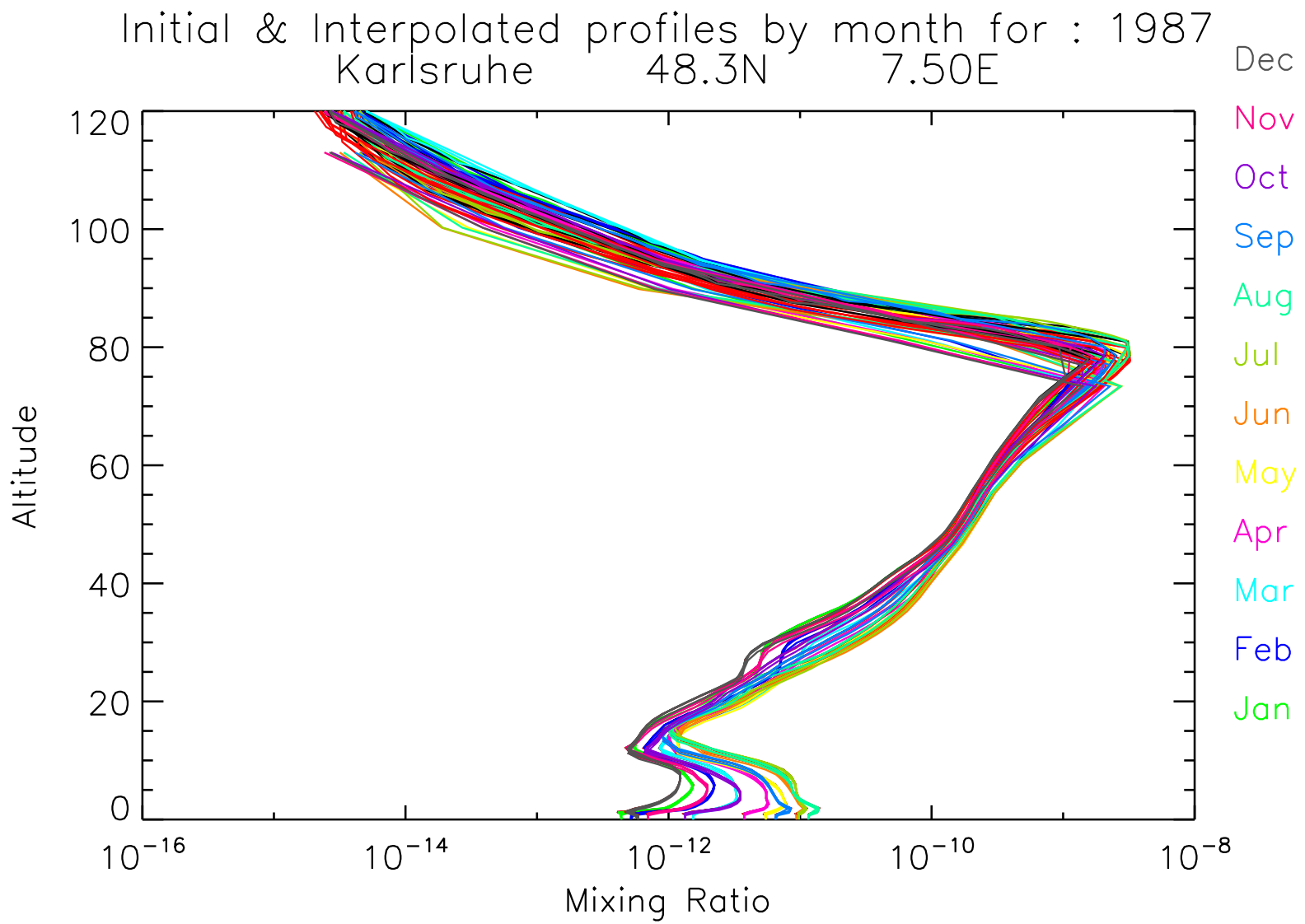
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1987
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
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Feb
Jan
Altitude
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40
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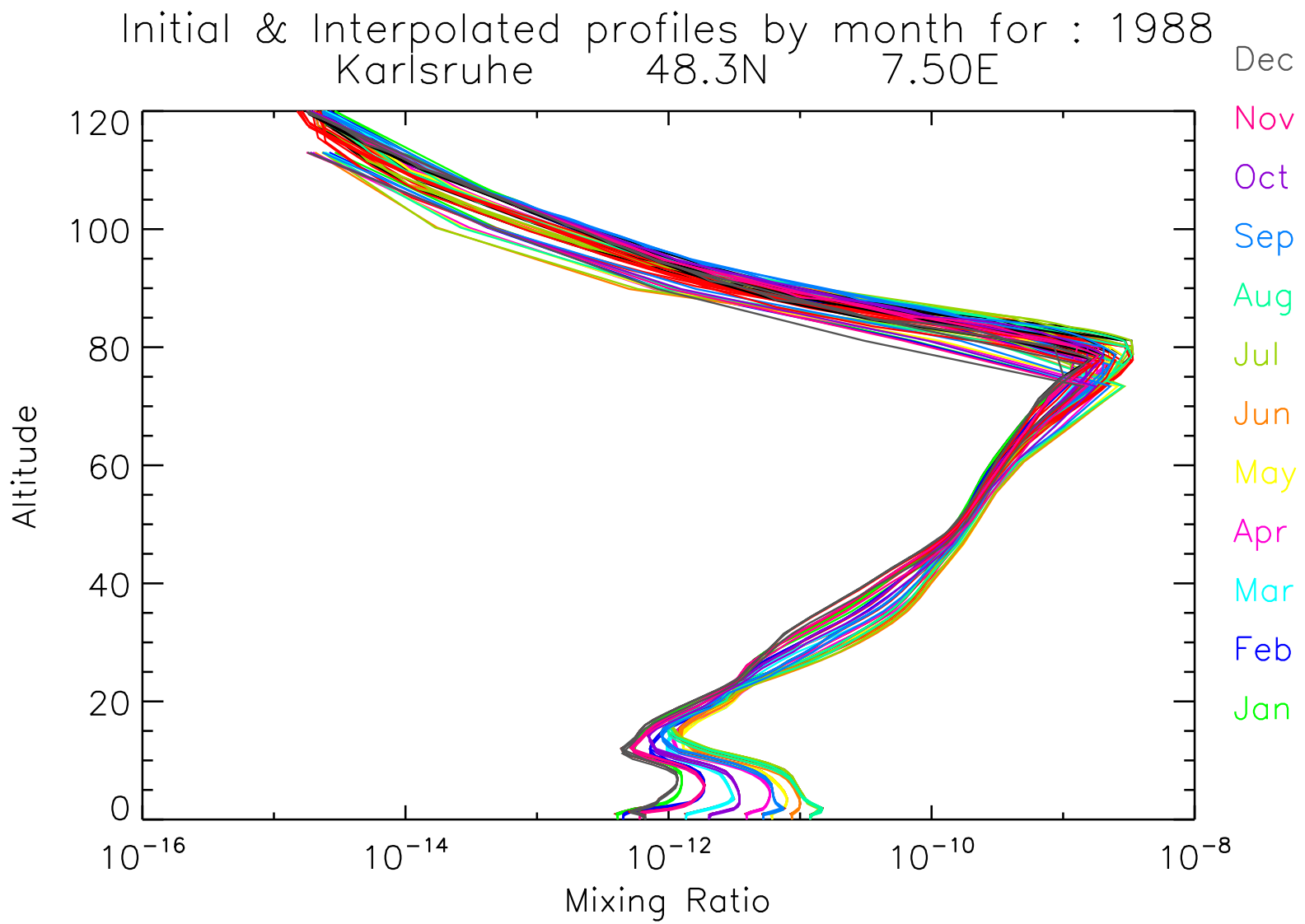
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1988
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
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Jan
120
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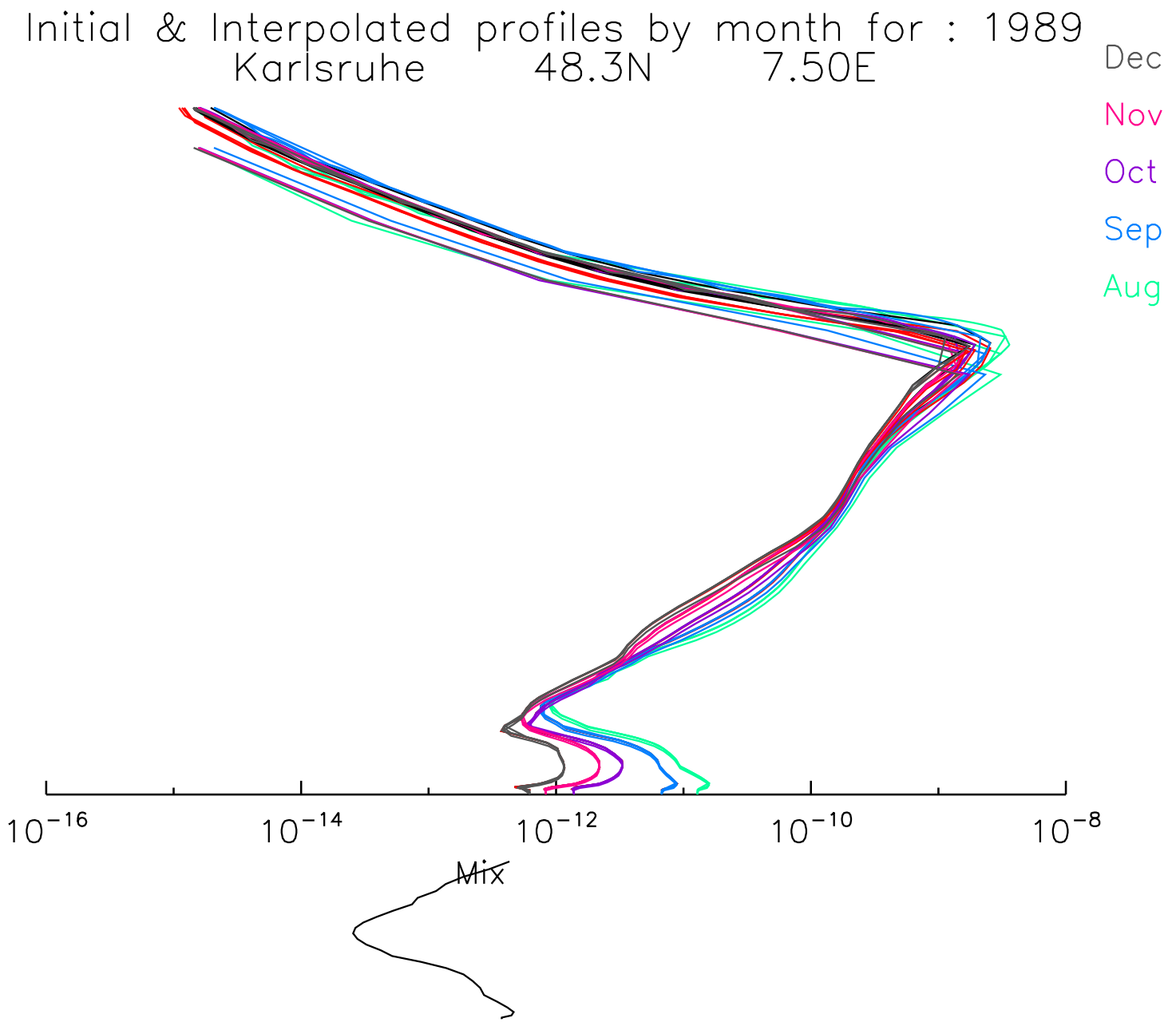
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1989
Karlsruhe 48.3N 7.50E
Dec
Nov
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Sep
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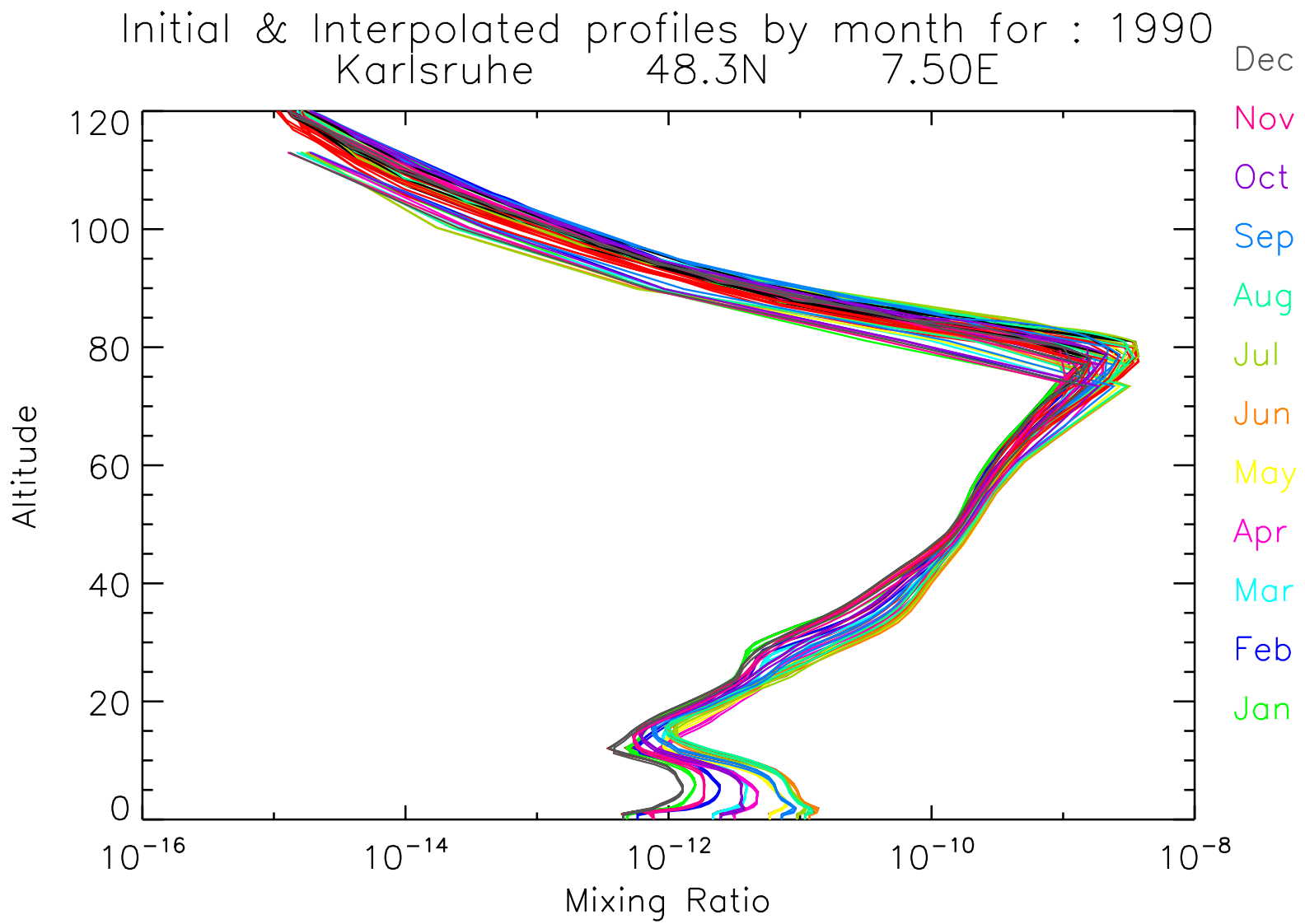
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mix


Initial & Interpolated profiles by month for : 1990
Karlsruhe 48.3N 7.50E
Dec
Nov
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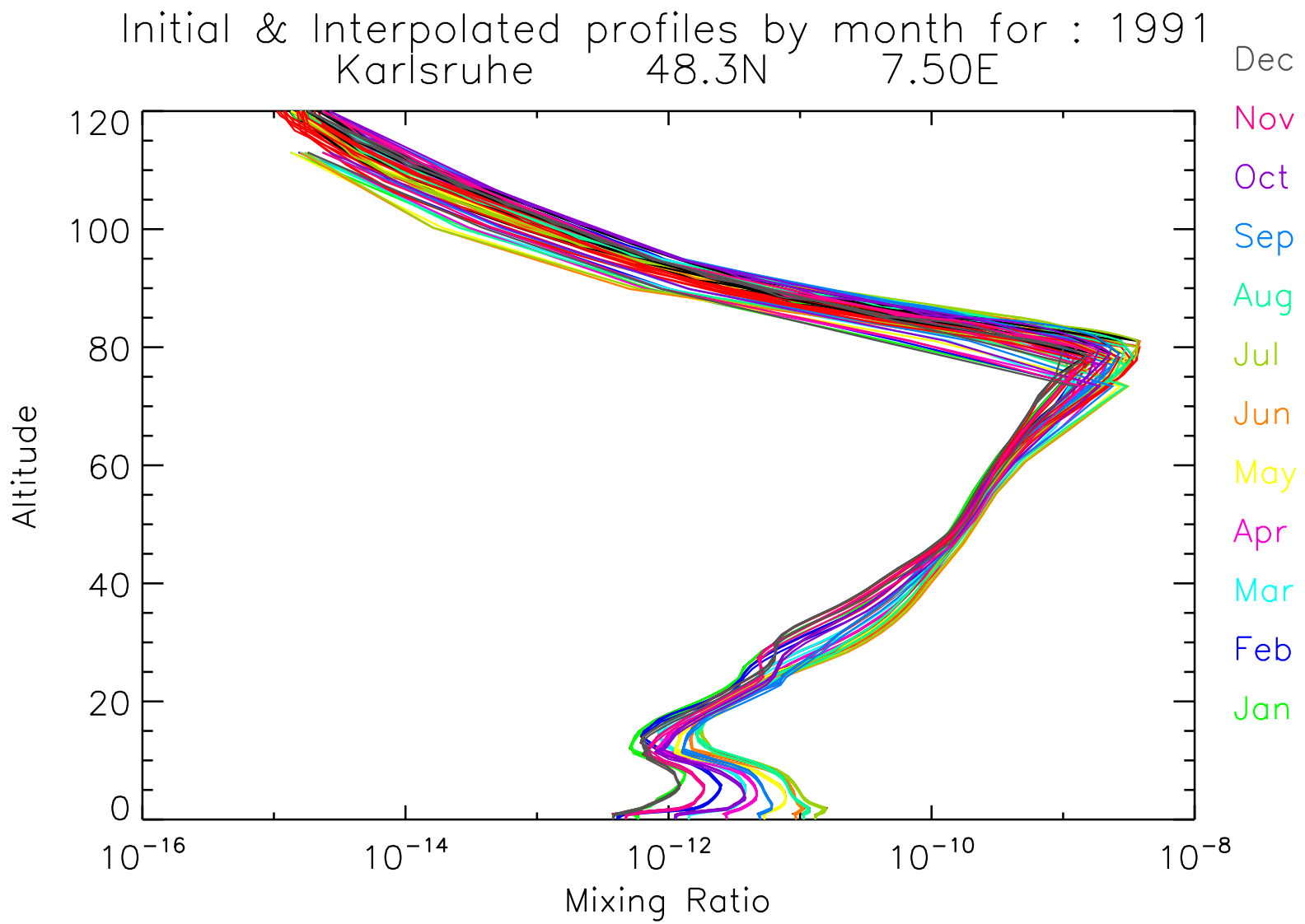
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1991
Karlsruhe 48.3N 7.50E
Dec
Nov
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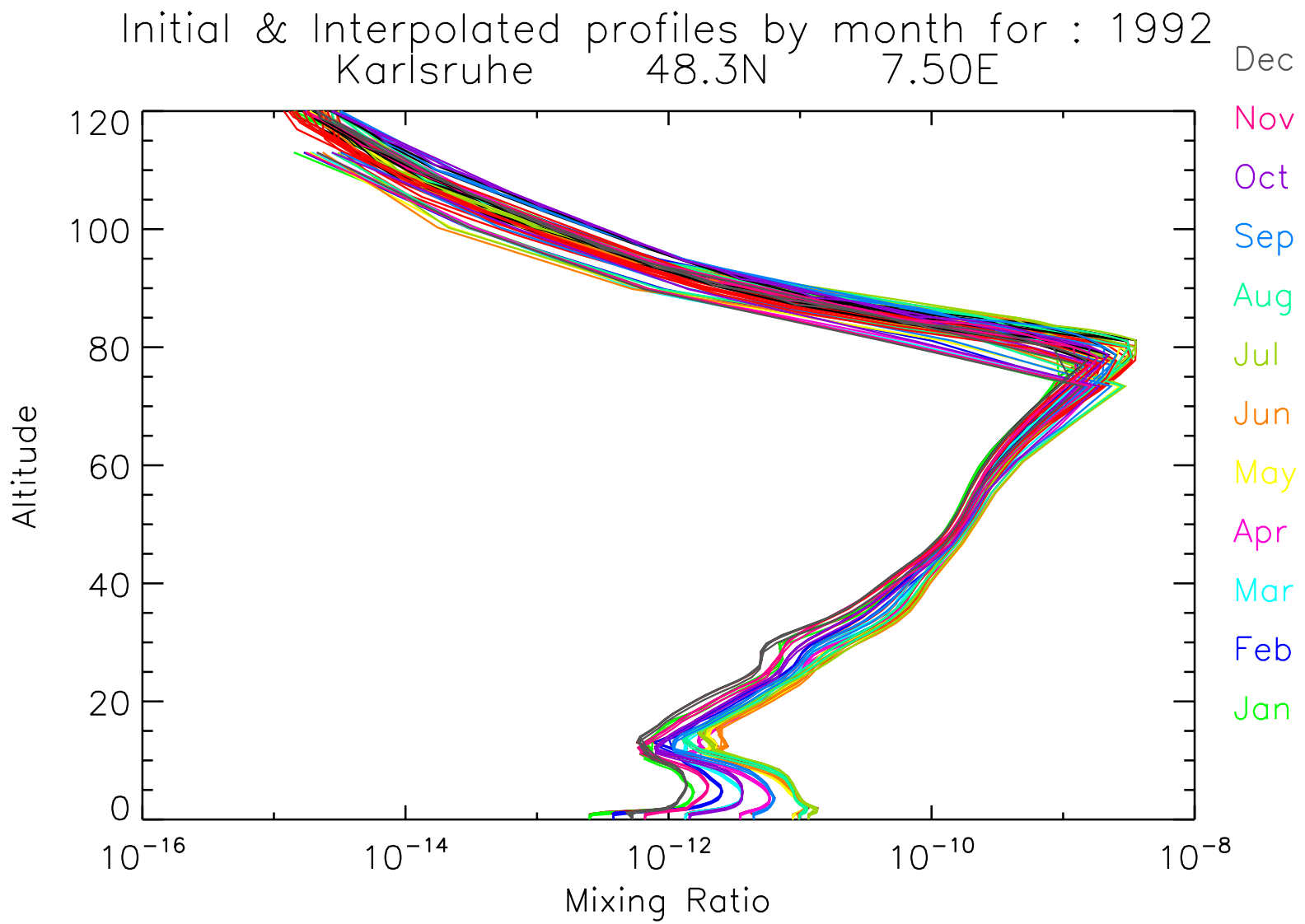
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1992
Karlsruhe 48.3N 7.50E
Dec
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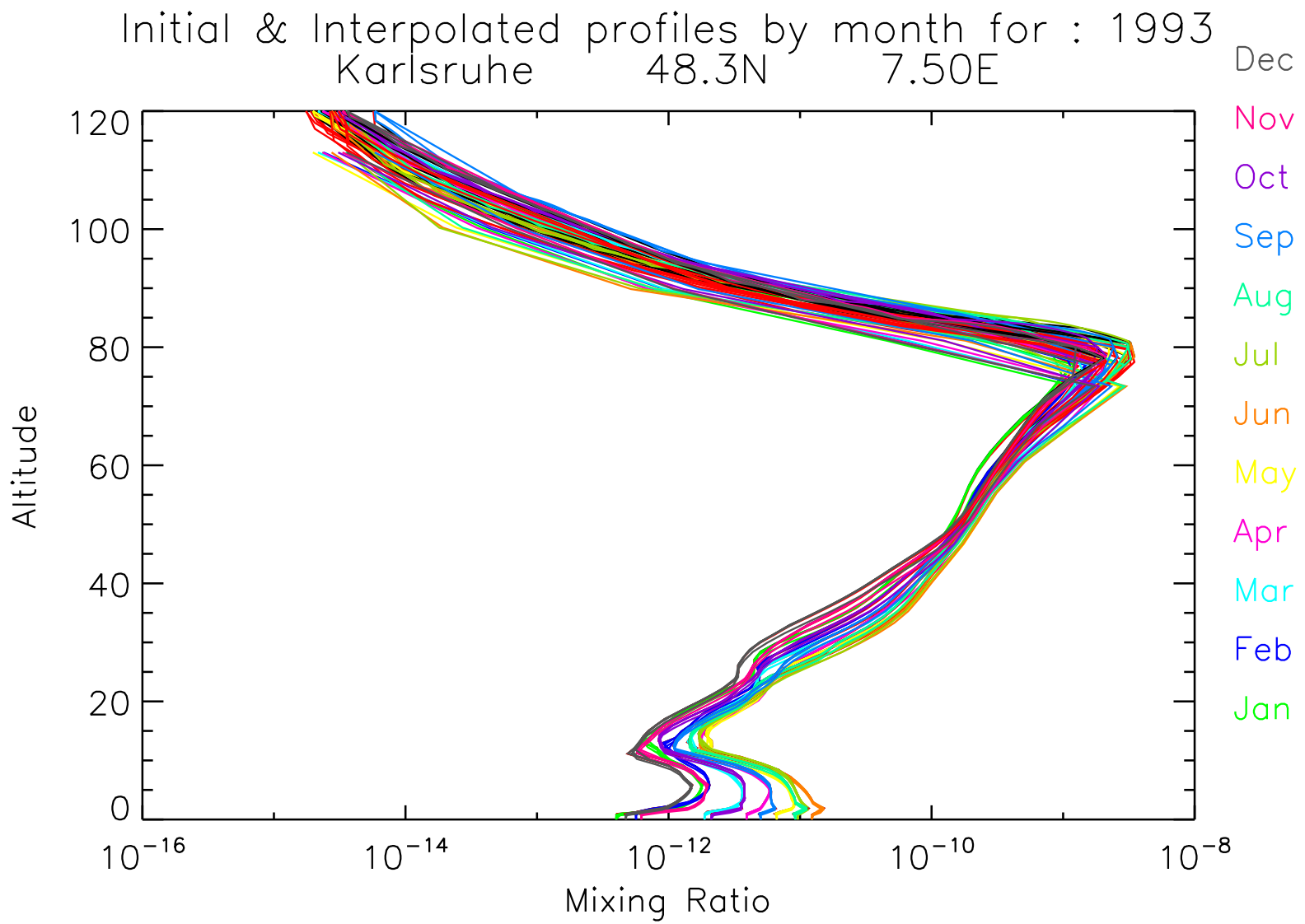
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1993
Karlsruhe 48.3N 7.50E
Dec
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Altitude
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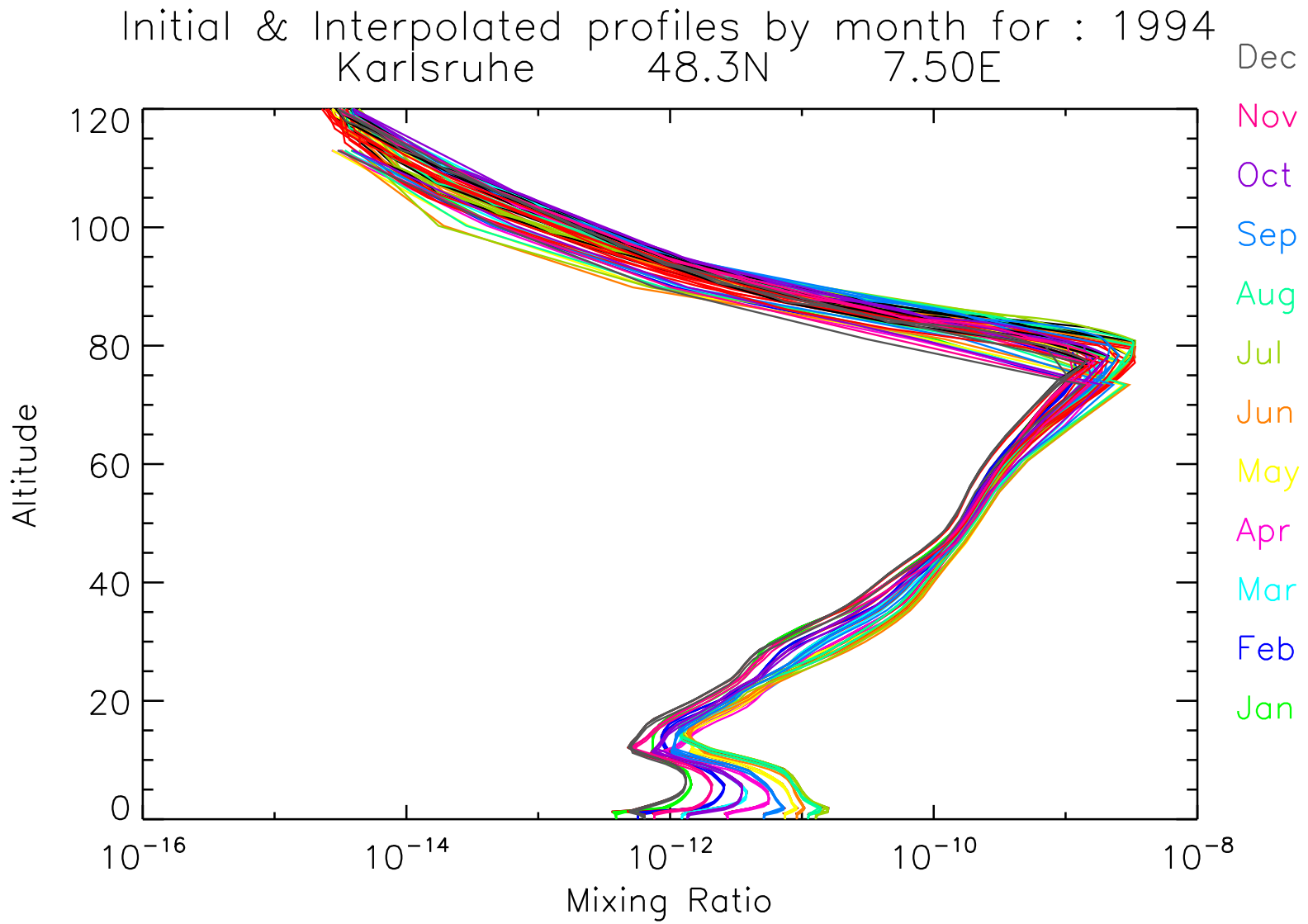
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1994
Karlsruhe 48.3N 7.50E
Dec
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Altitude
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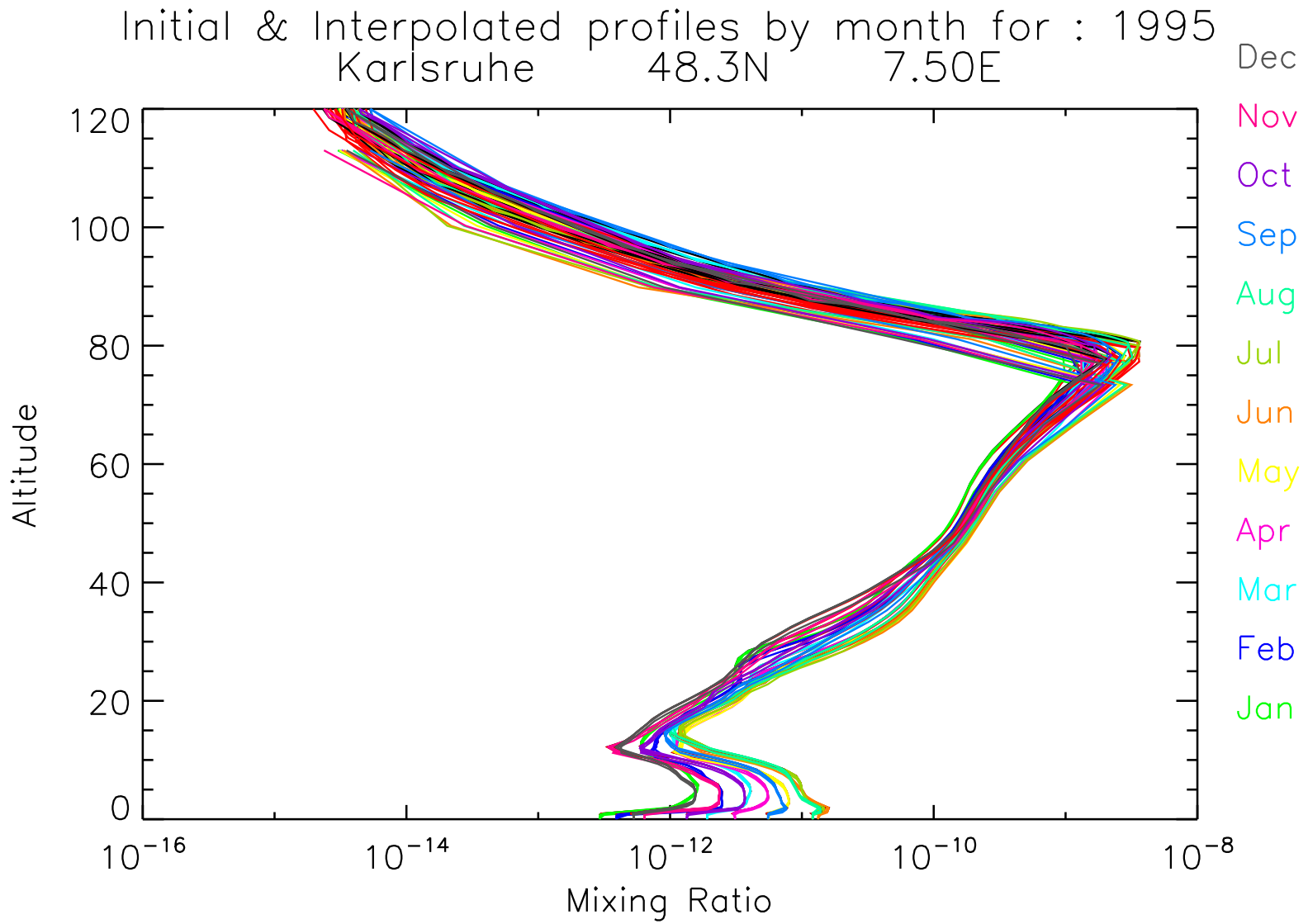
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1995
Karlsruhe 48.3N 7.50E
Dec
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Altitude
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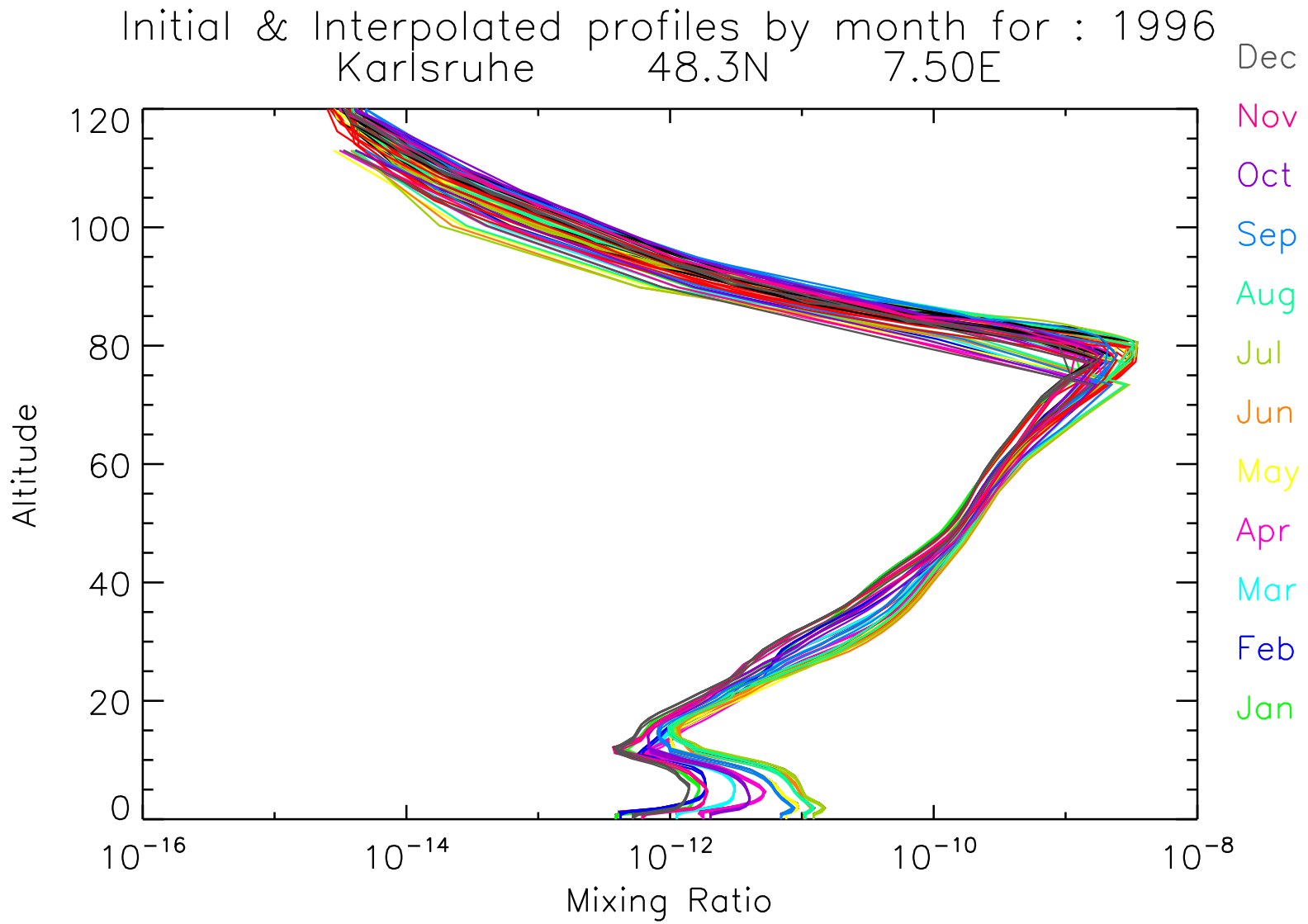
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1996
Karlsruhe 48.3N 7.50E
Dec
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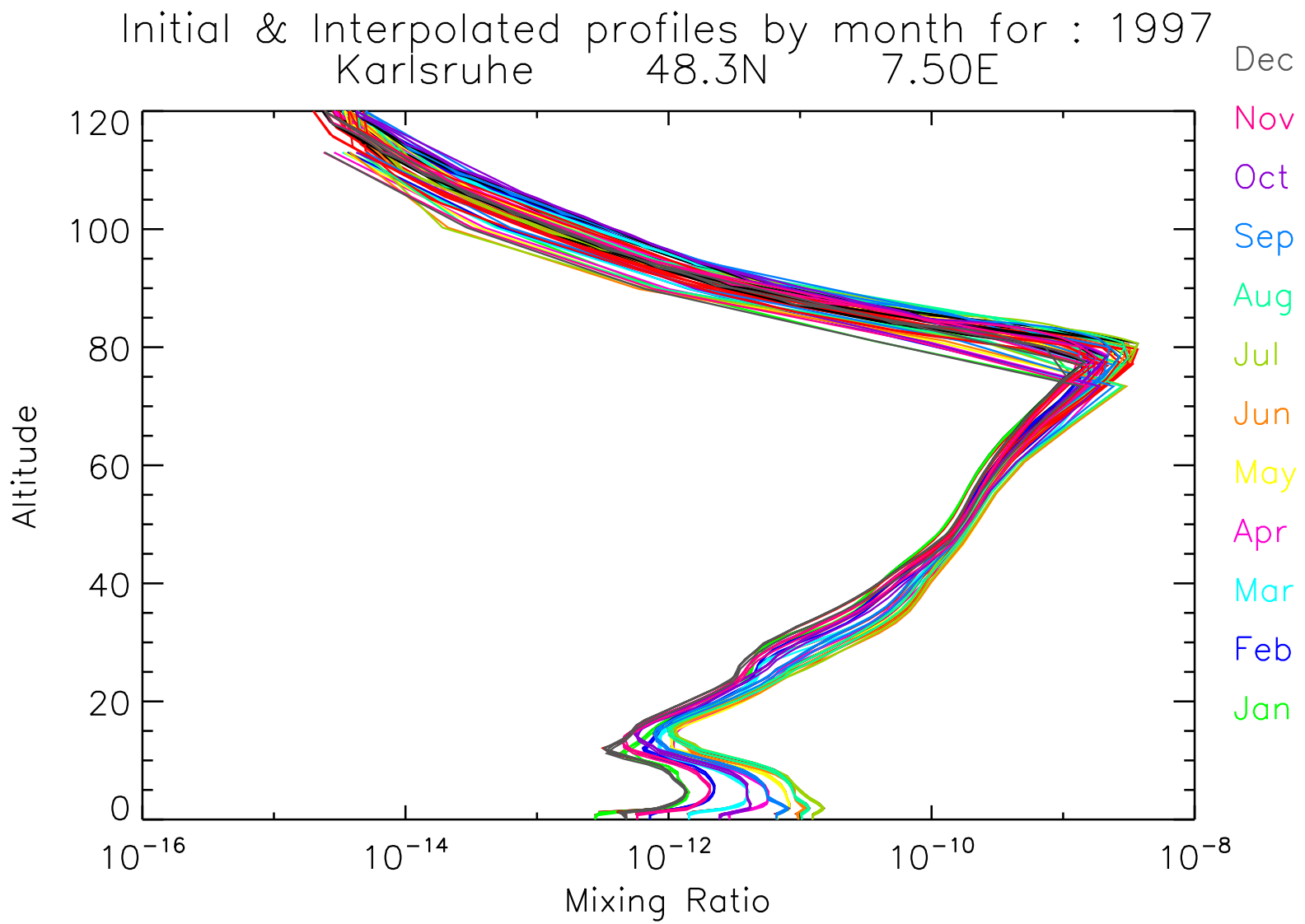
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1997
Karlsruhe 48.3N 7.50E
Dec
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Jan
120
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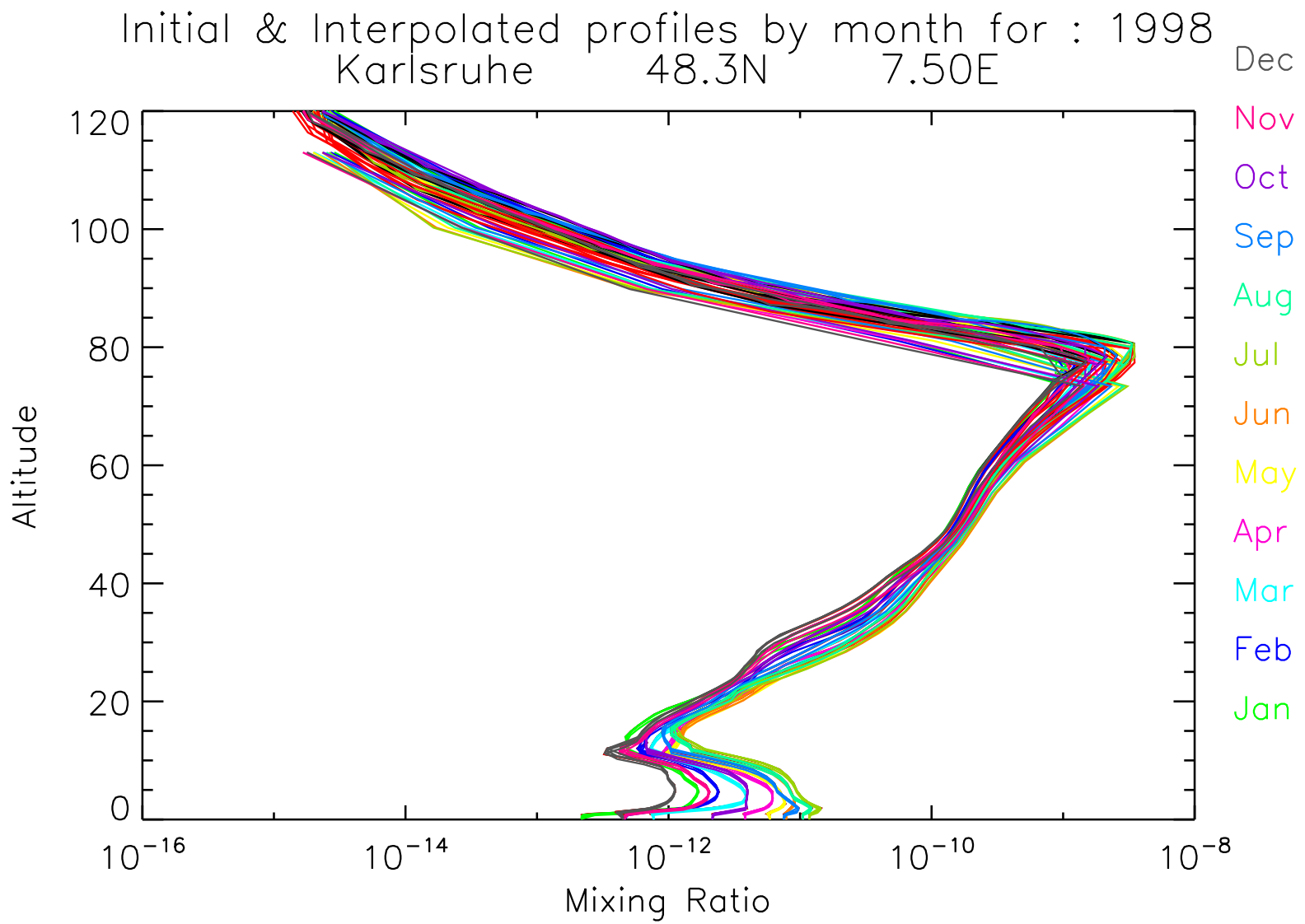
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1998
Karlsruhe 48.3N 7.50E
Dec
Nov
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Feb
Jan
120
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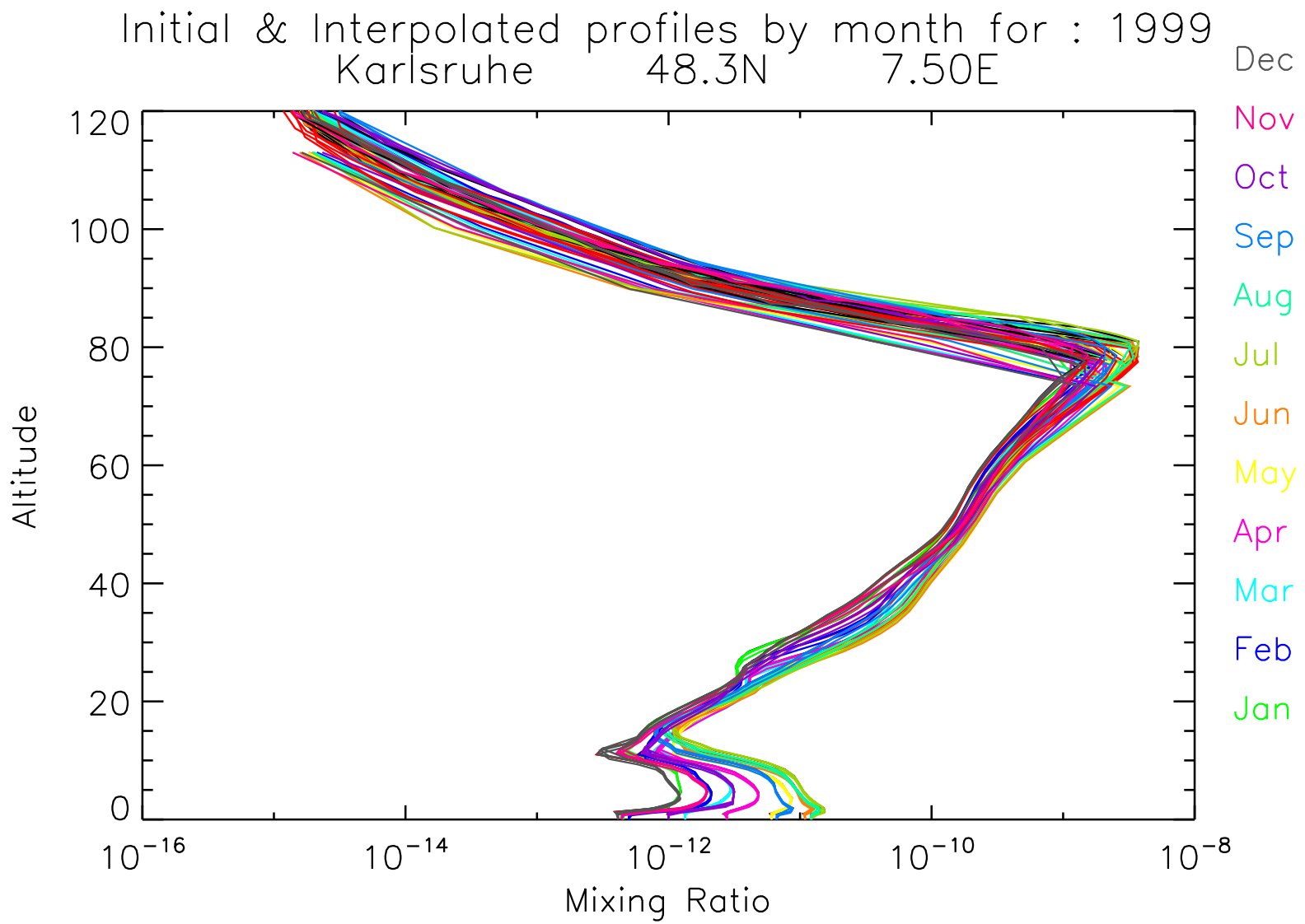
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 1999
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
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May
Apr
Mar
Feb
Jan
120
100
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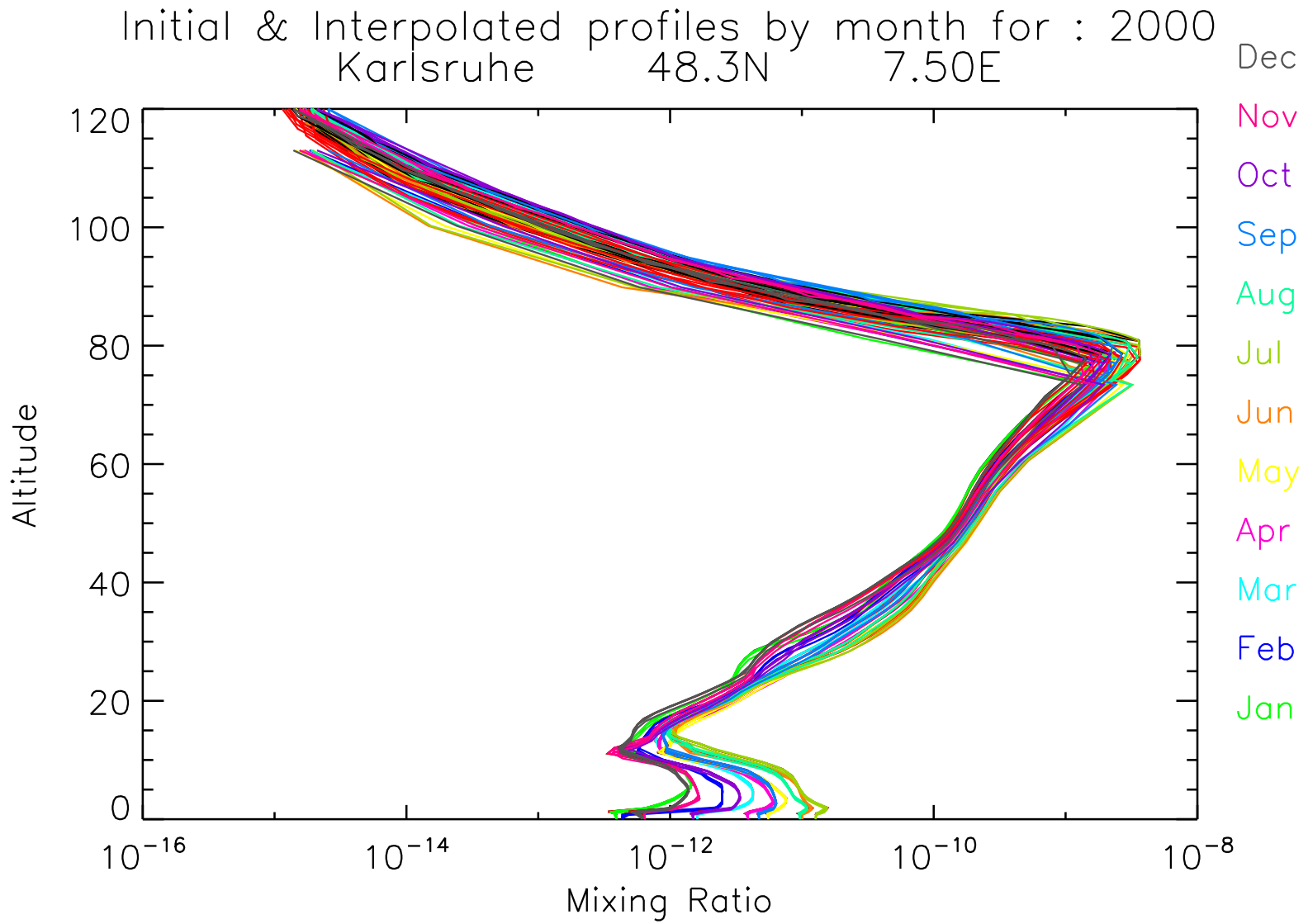
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2000
Karlsruhe 48.3N 7.50E
Altitude
120
100
80
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40
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0
10^{-16}
10^{-14}
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10^{-8}
Mixing Ratio
Dec
Nov
Oct
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Jul
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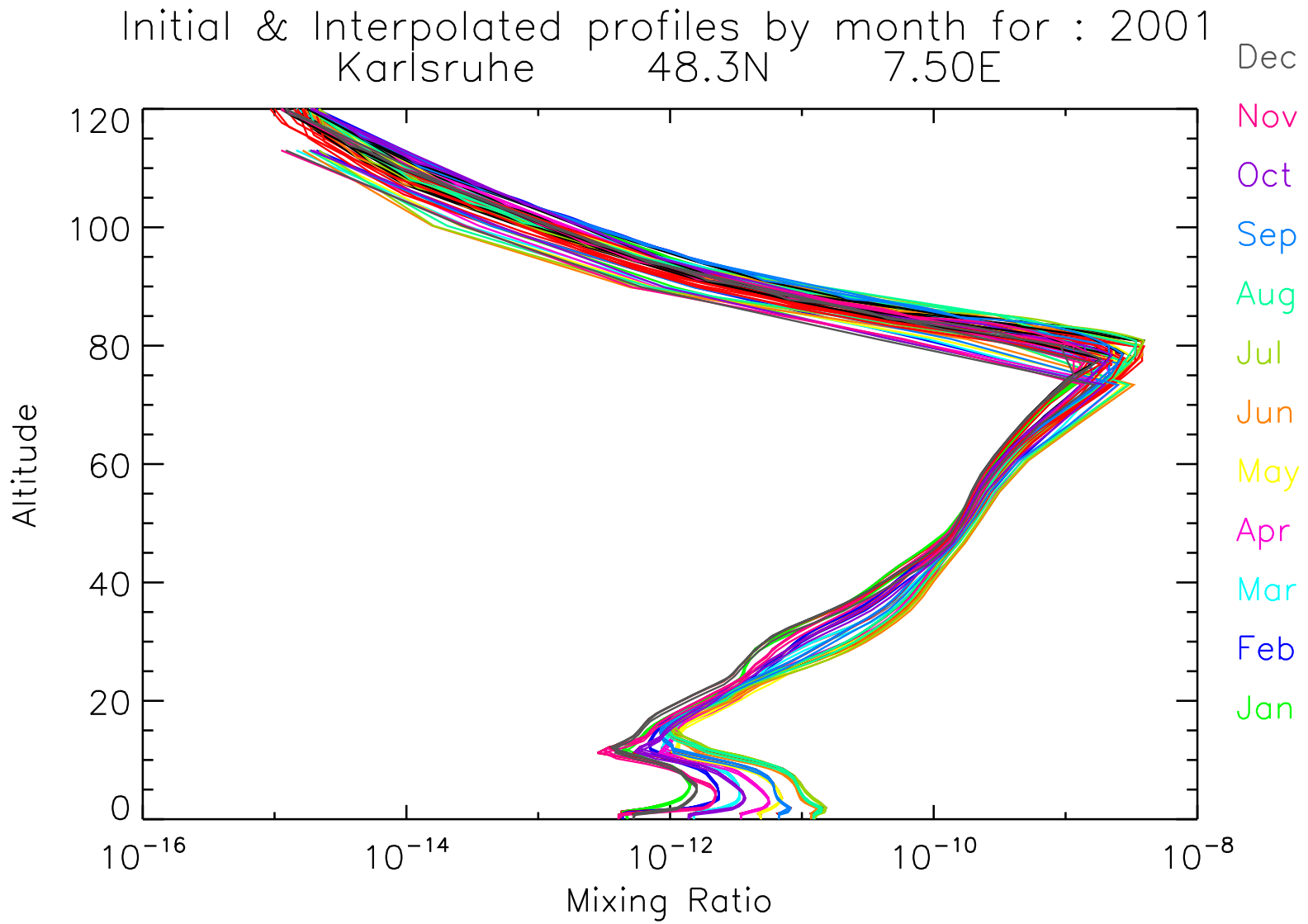
May
Apr
Mar
Feb
Jan


Initial & Interpolated profiles by month for : 2001
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
Altitude
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80
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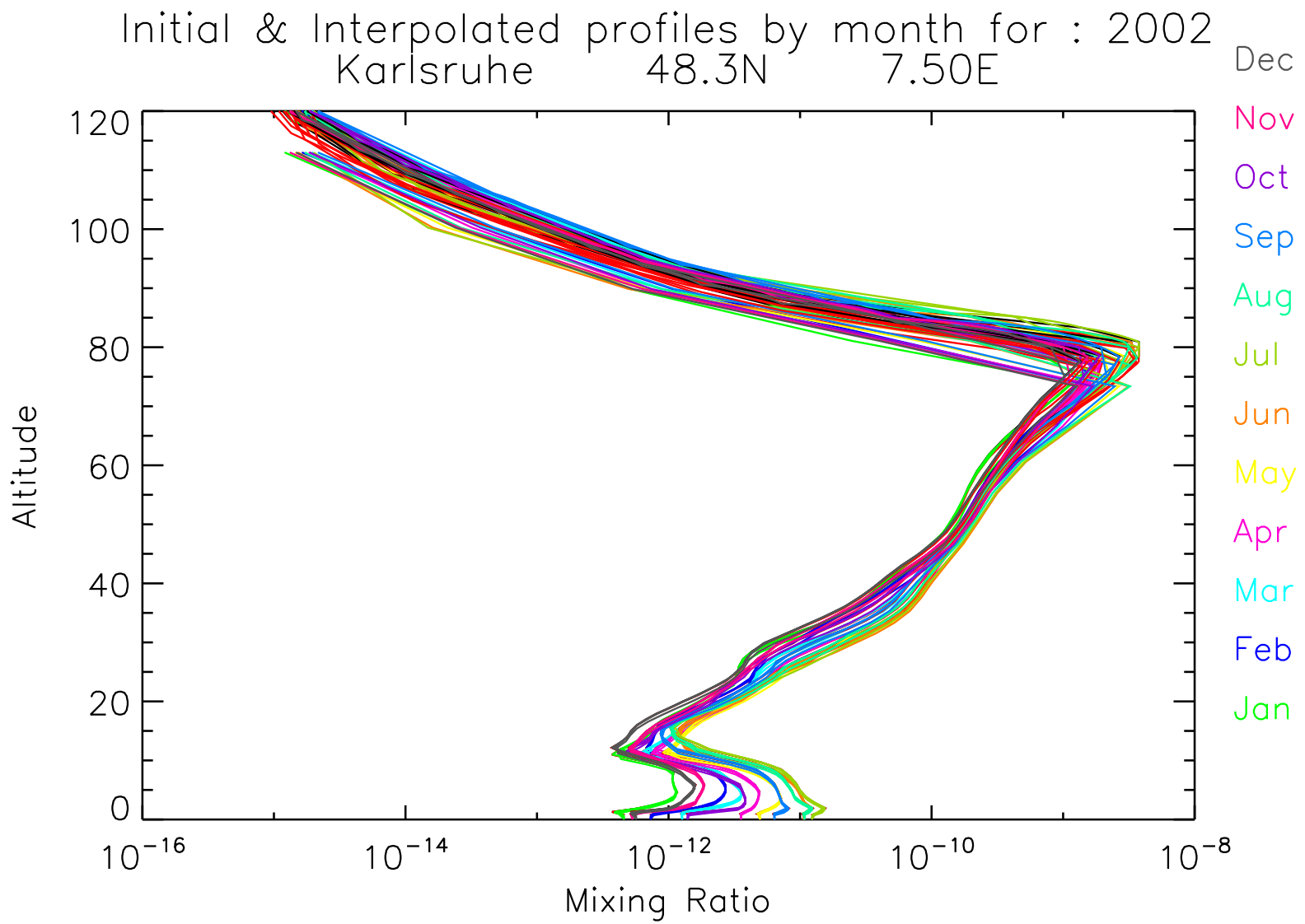
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2002
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
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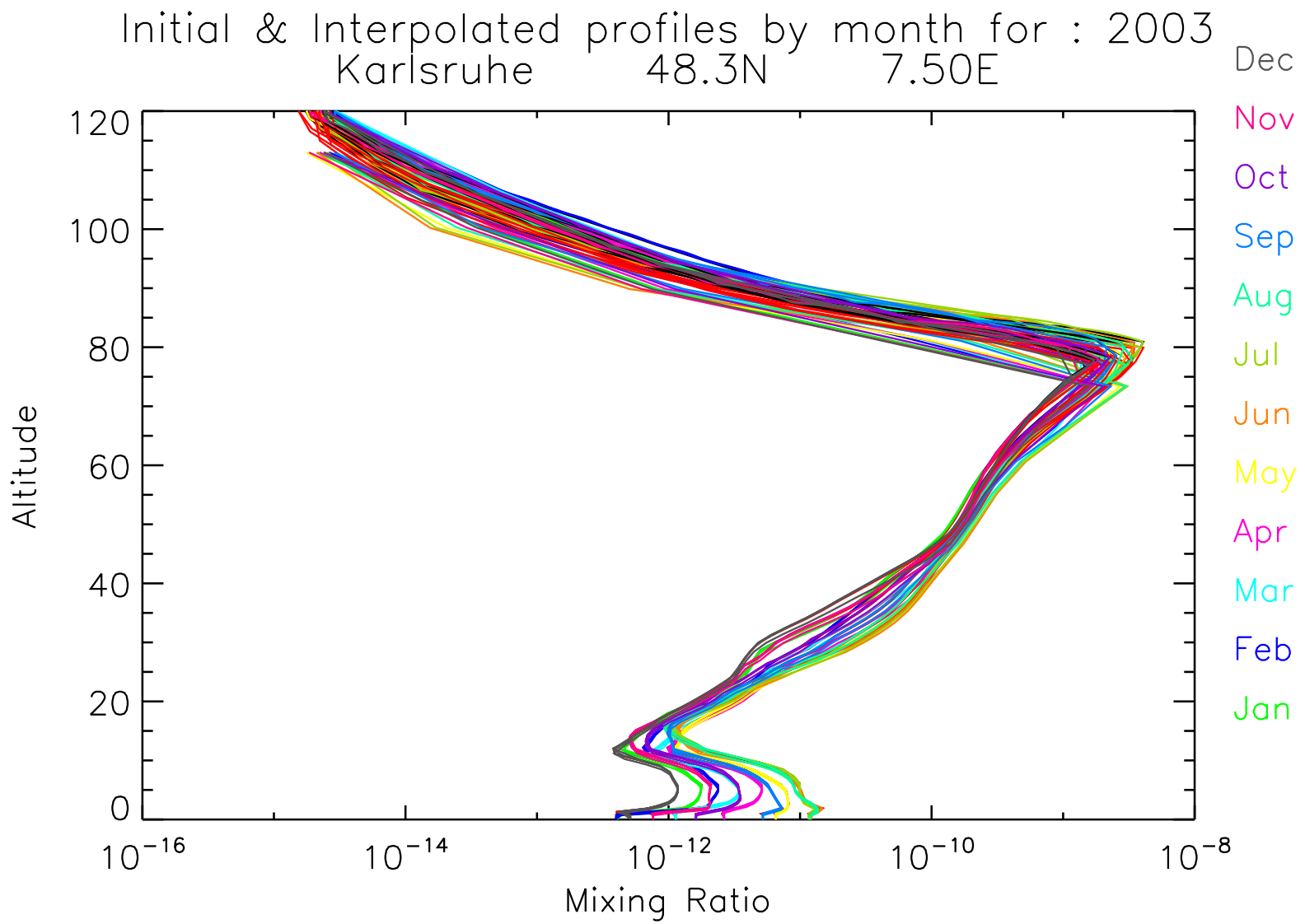
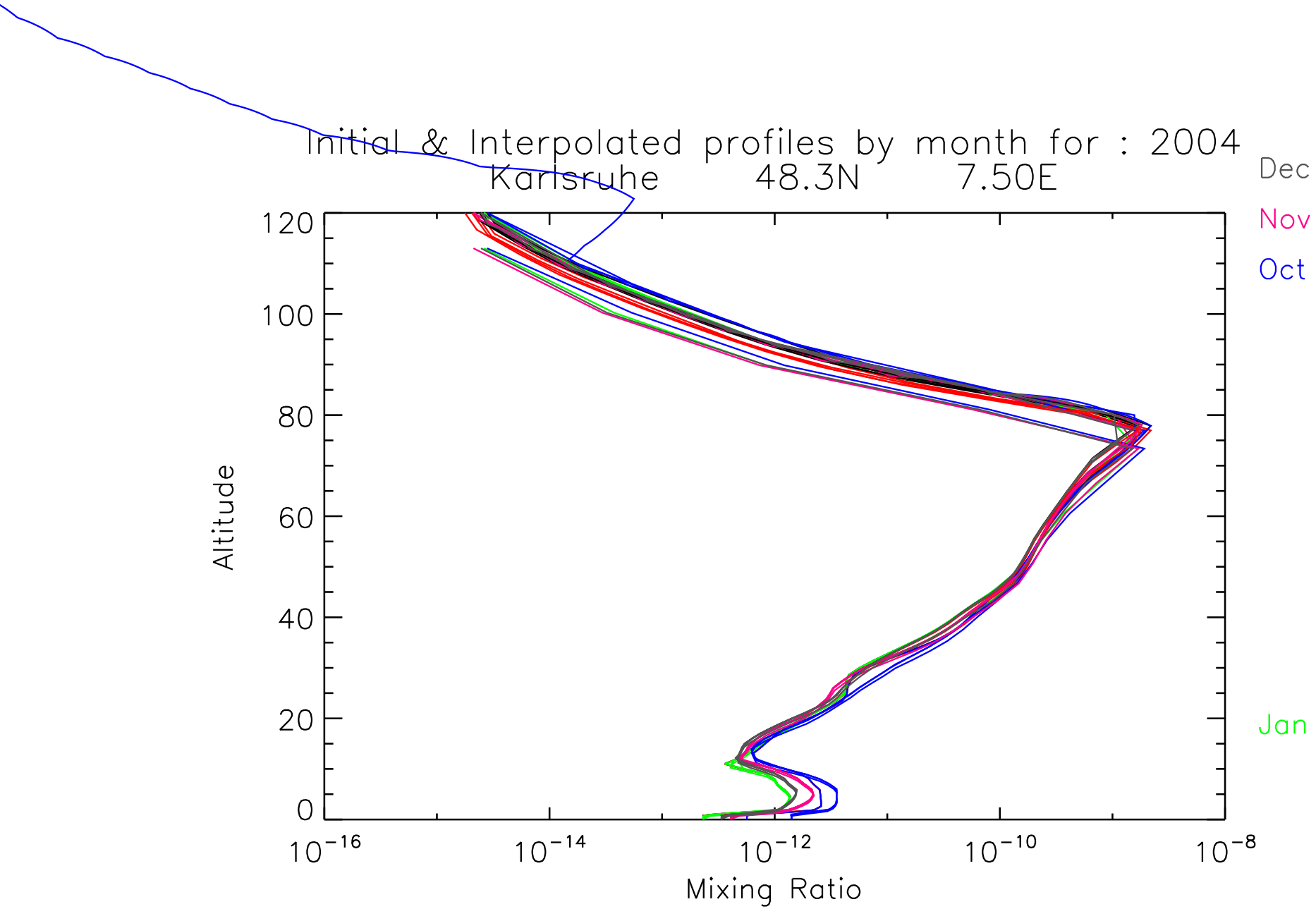
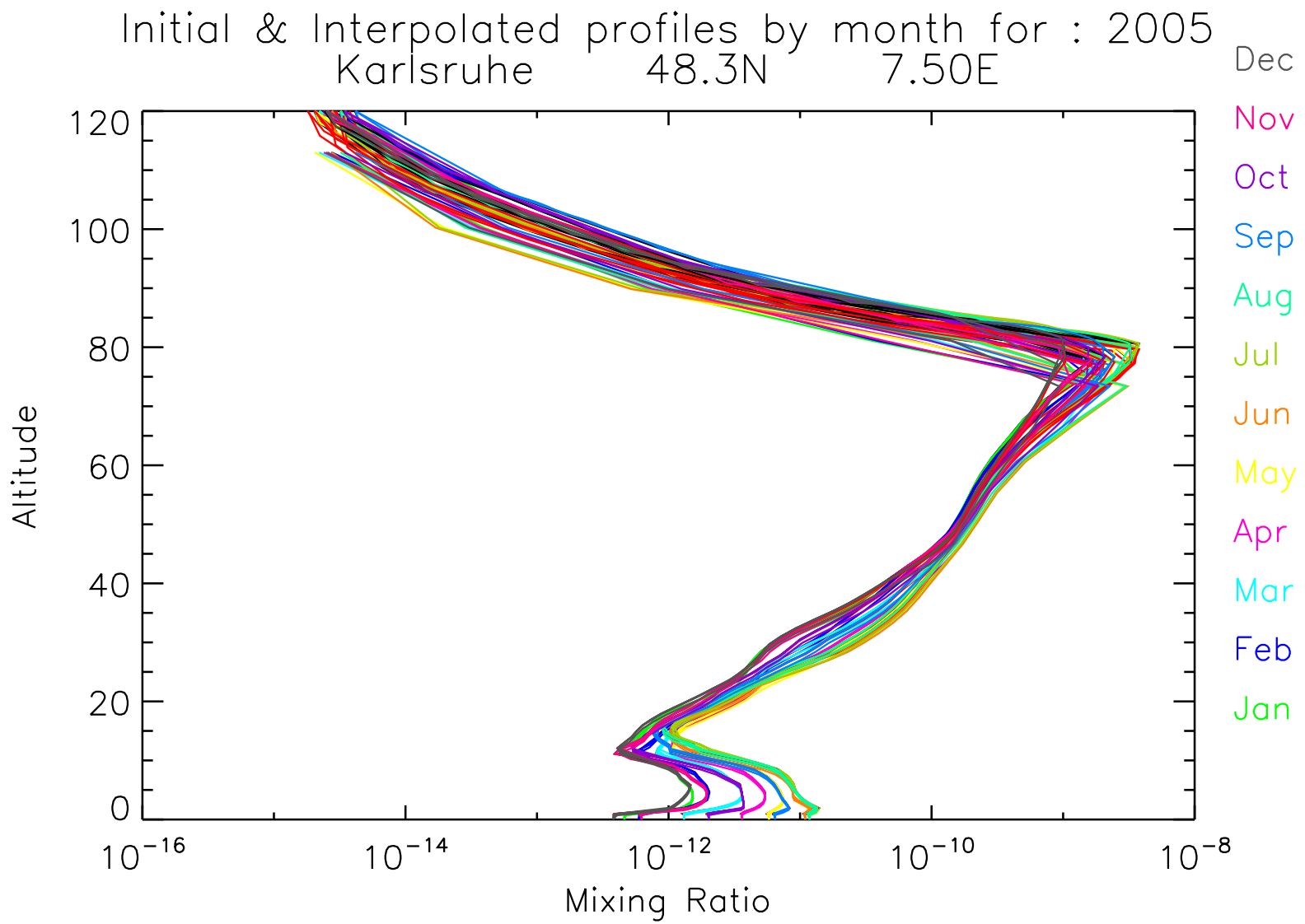
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2003
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2004
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Jan
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2005
Karlsruhe 48.3N 7.50E
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio
Dec
Nov
Oct
Sep
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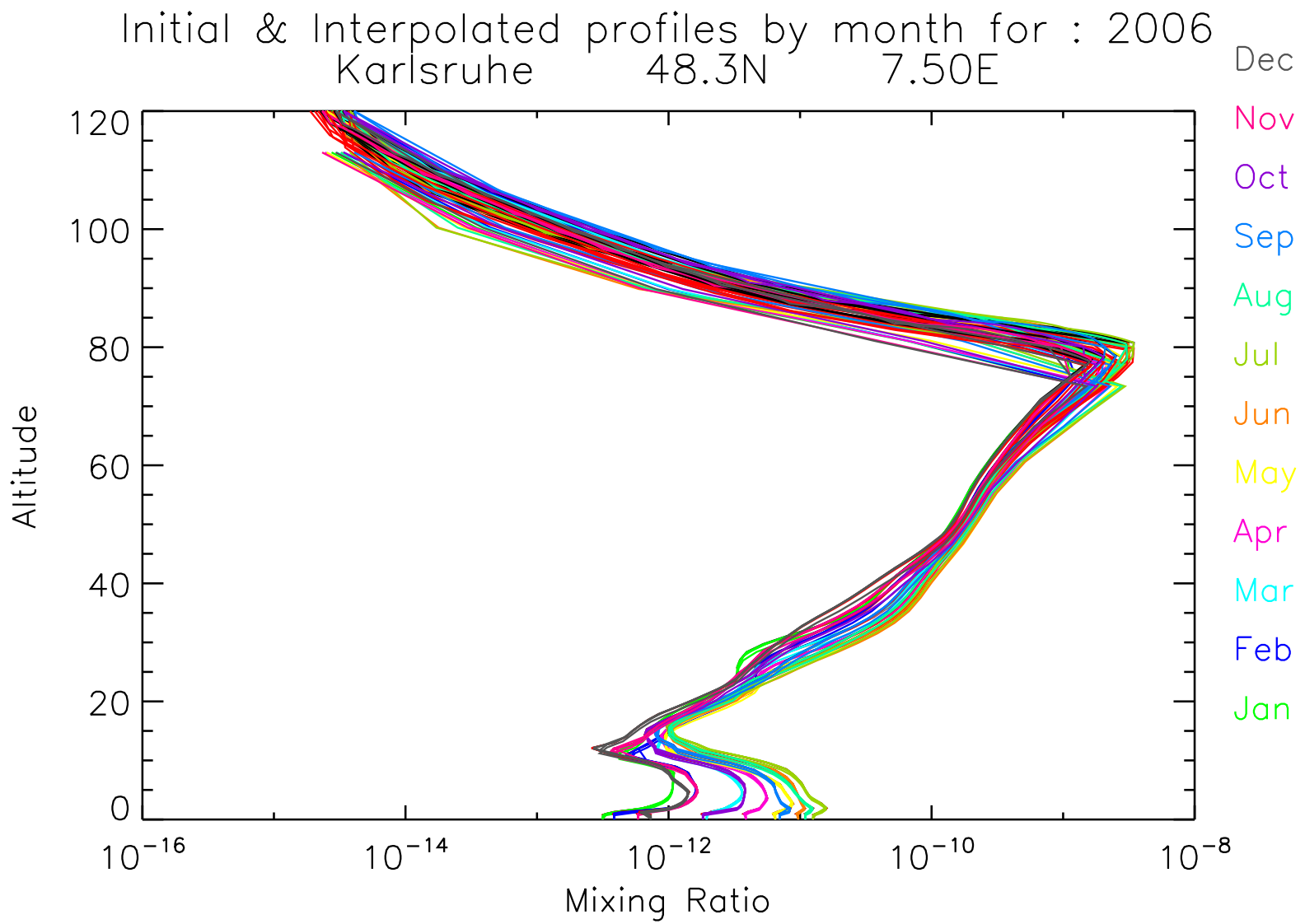
Jul
Jun
May
Apr
Mar
Feb
Jan


Initial & Interpolated profiles by month for : 2006
Karlsruhe 48.3N 7.50E
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
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10^{-8}
Mixing Ratio
Dec
Nov
Oct
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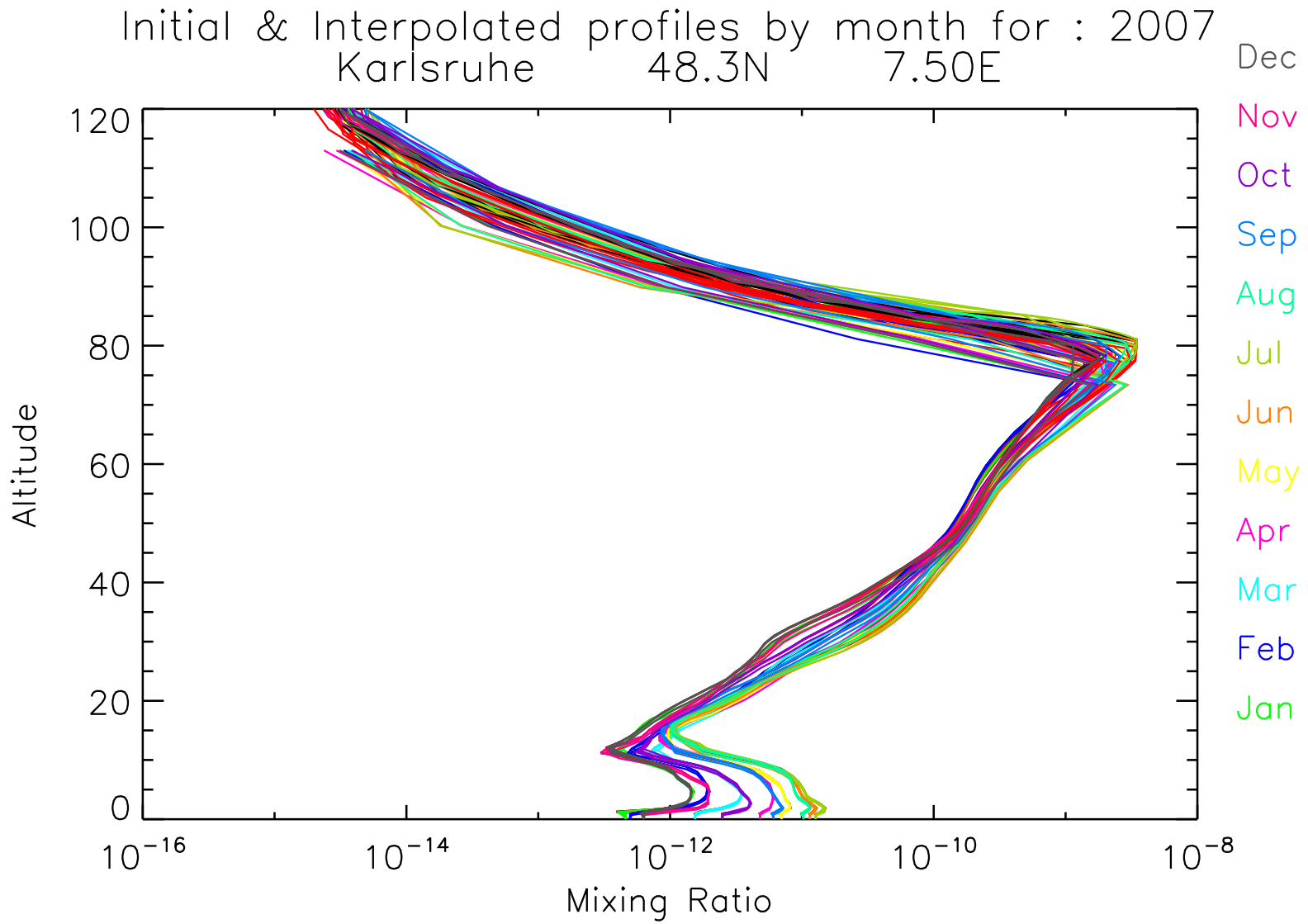
Feb
Jan


Initial & Interpolated profiles by month for : 2007
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
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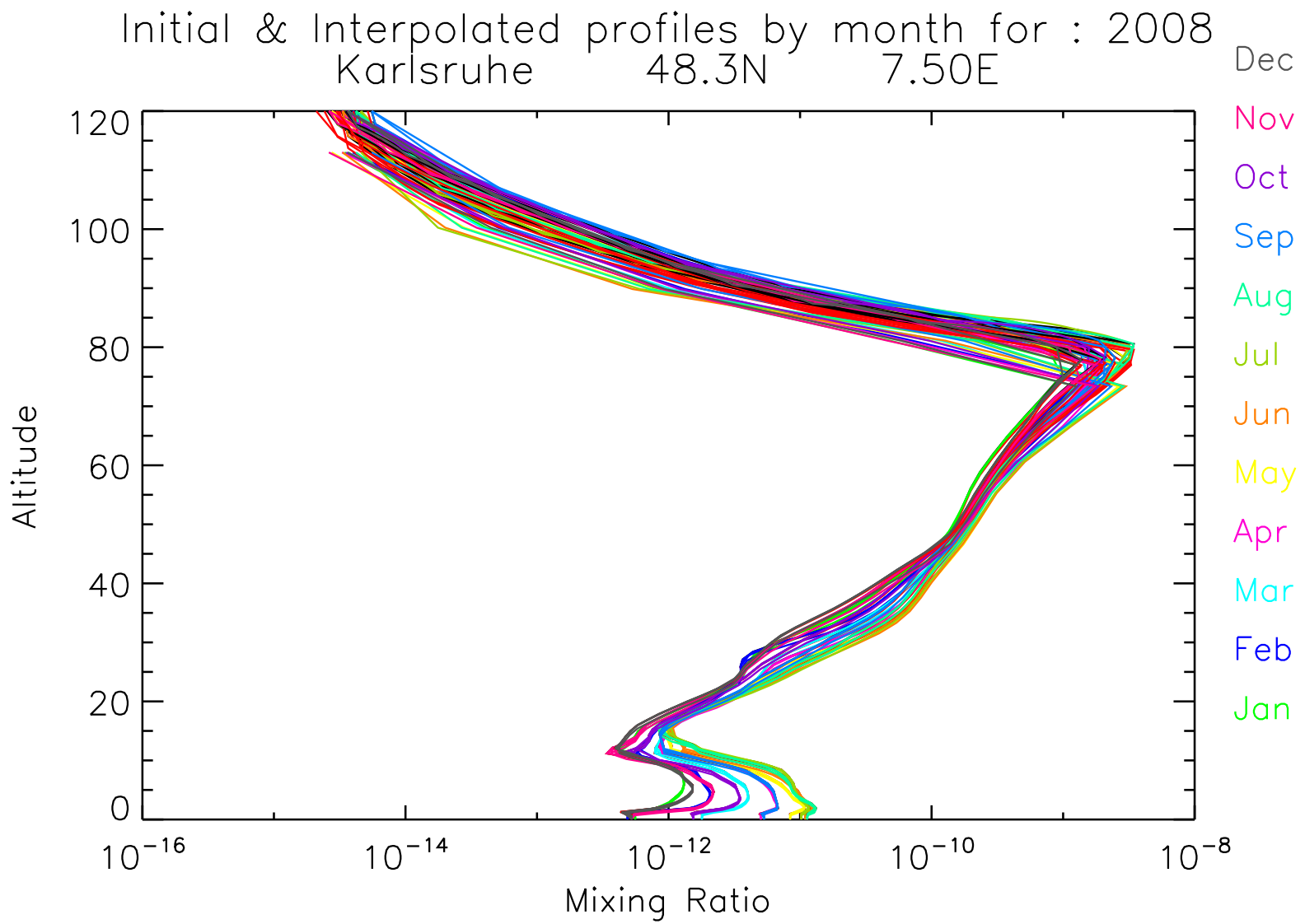
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2008
Karlsruhe 48.3N 7.50E
Altitude
120
100
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60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio
Dec
Nov
Oct
Sep
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Jun
May
Apr
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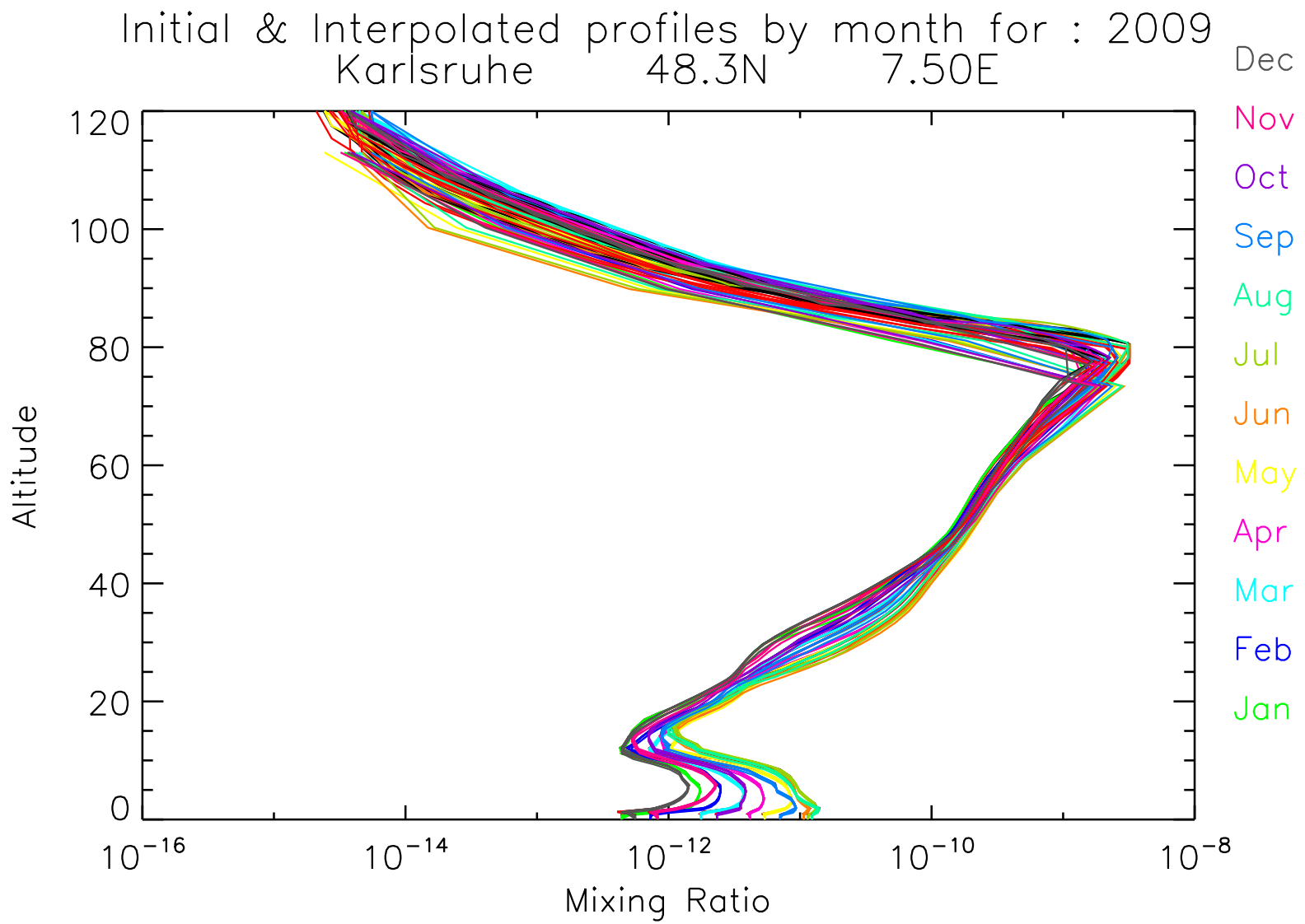
Feb
Jan


Initial & Interpolated profiles by month for : 2009
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
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Jun
May
Apr
Mar
Feb
Jan
120
100
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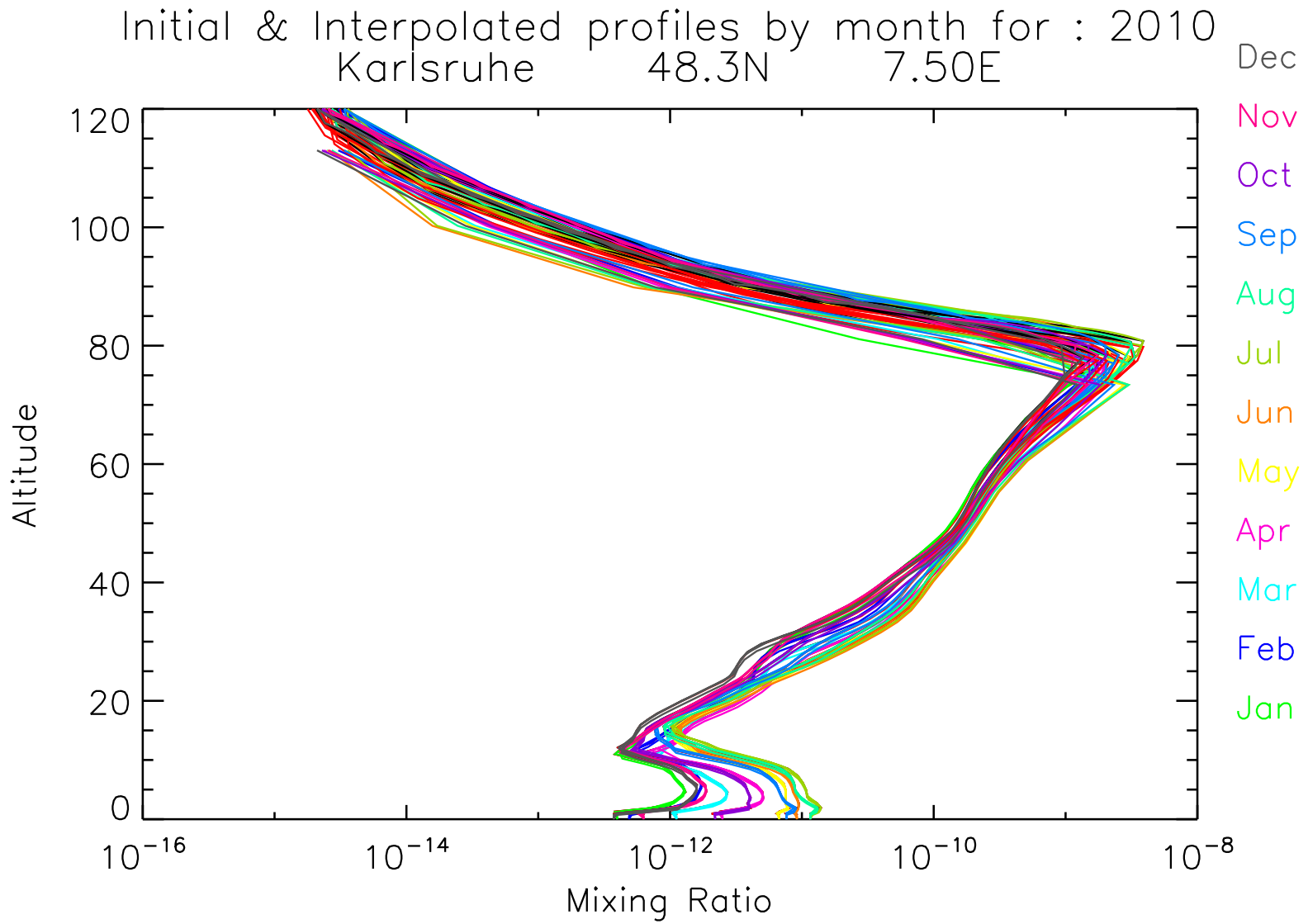
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Initial & Interpolated profiles by month for : 2010
Karlsruhe 48.3N 7.50E
Altitude
120
100
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10^{-16}
10^{-14}
10^{-12}
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10^{-8}
Mixing Ratio
Dec
Nov
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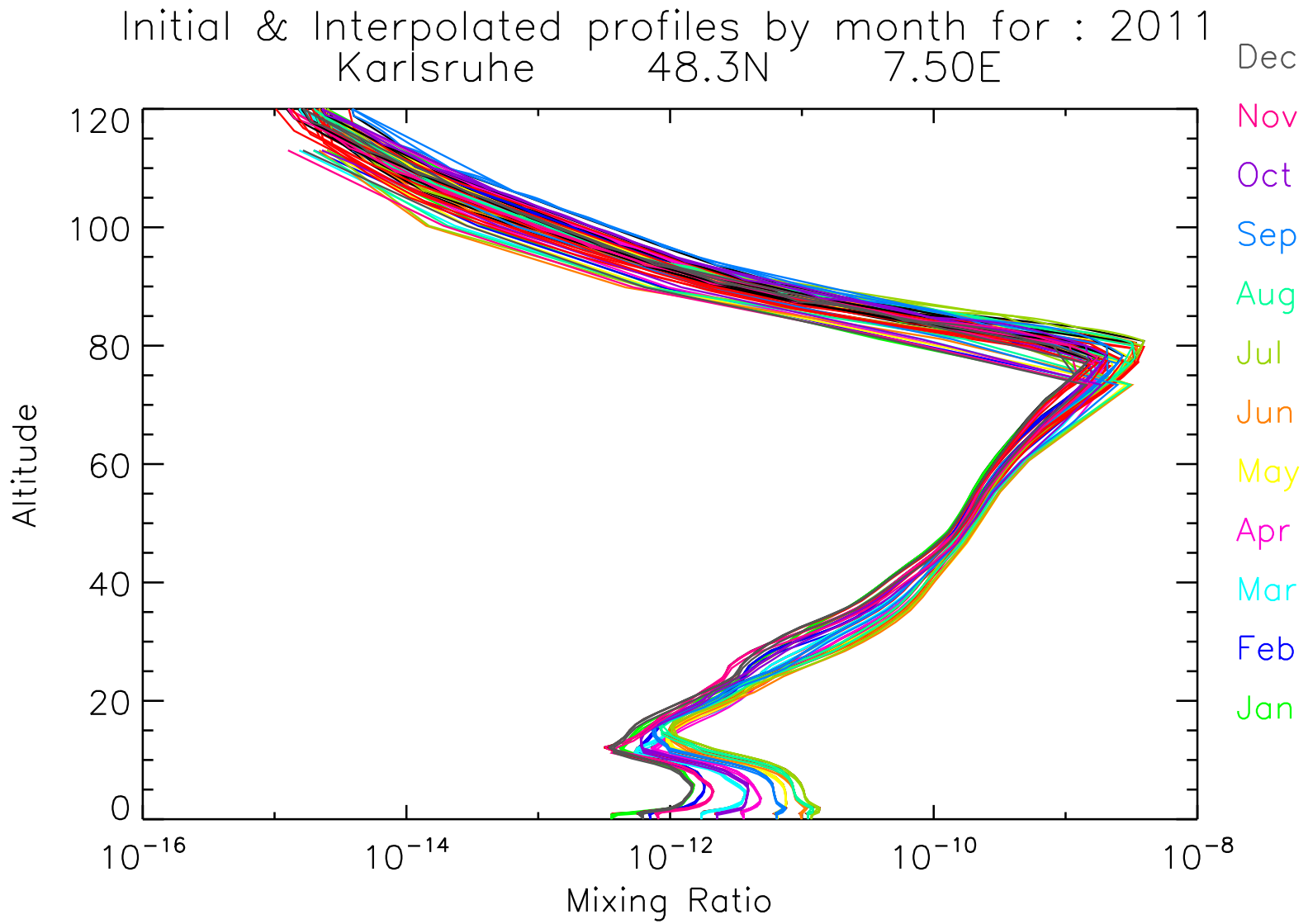
Feb
Jan


Initial & Interpolated profiles by month for : 2011
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
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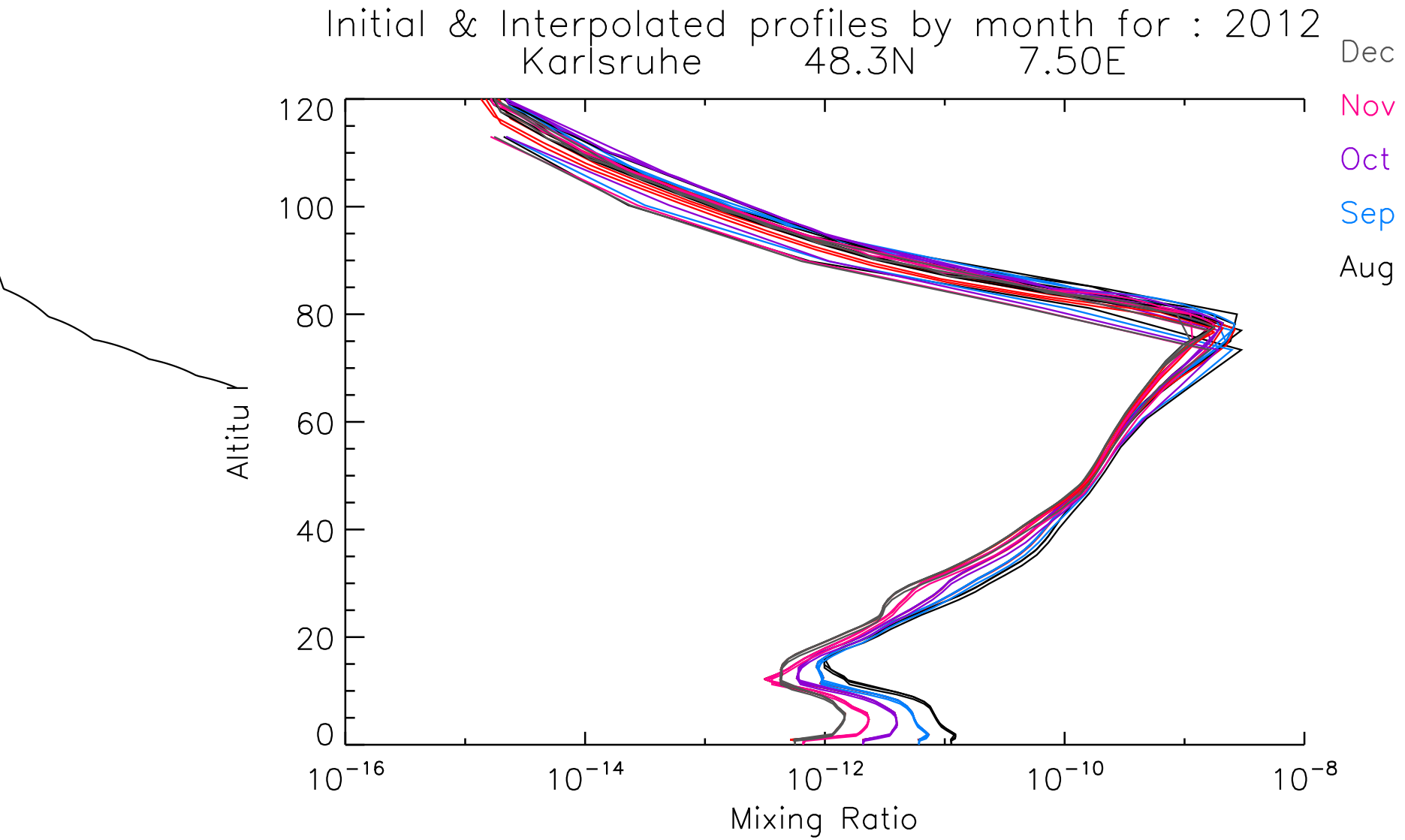
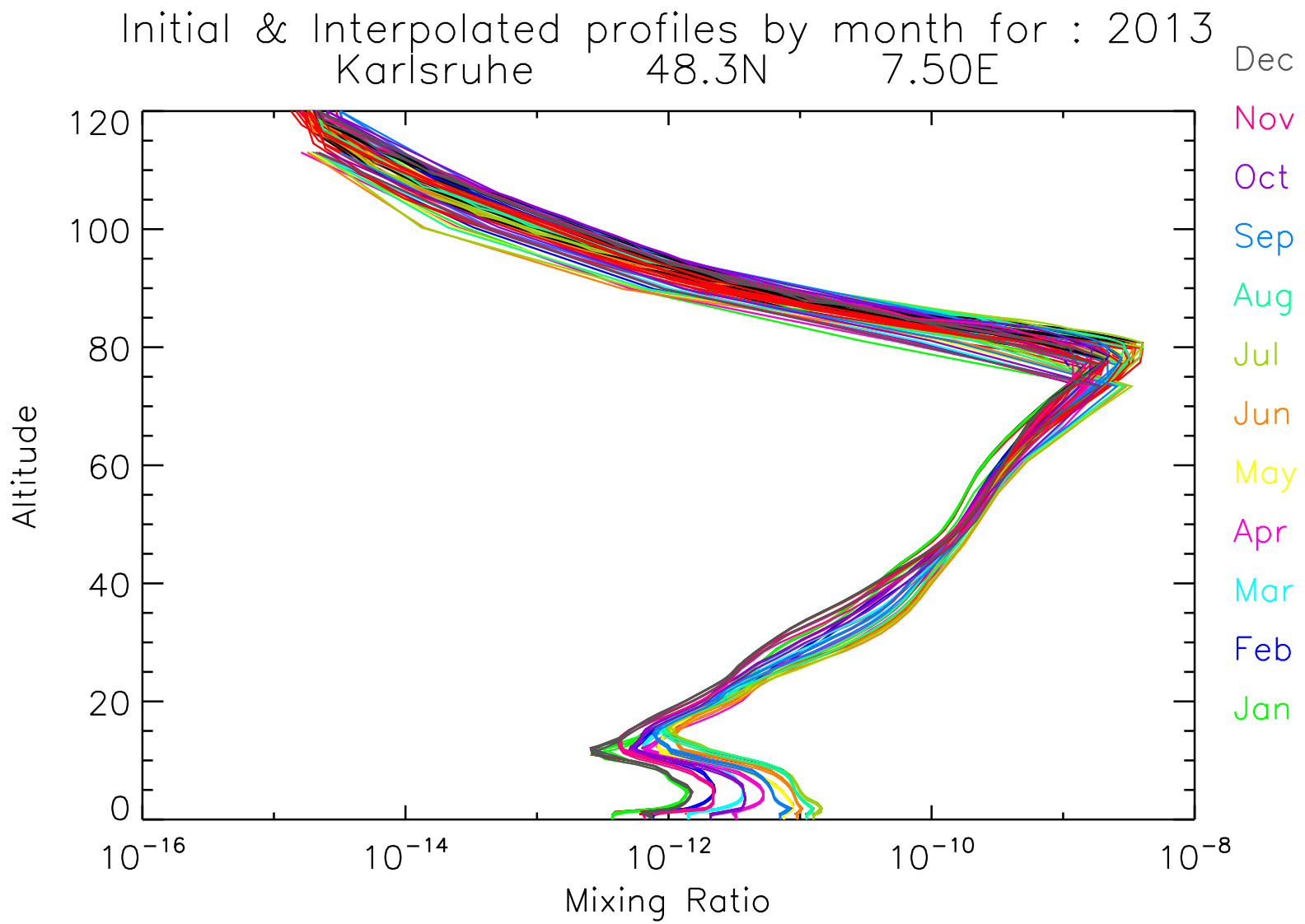
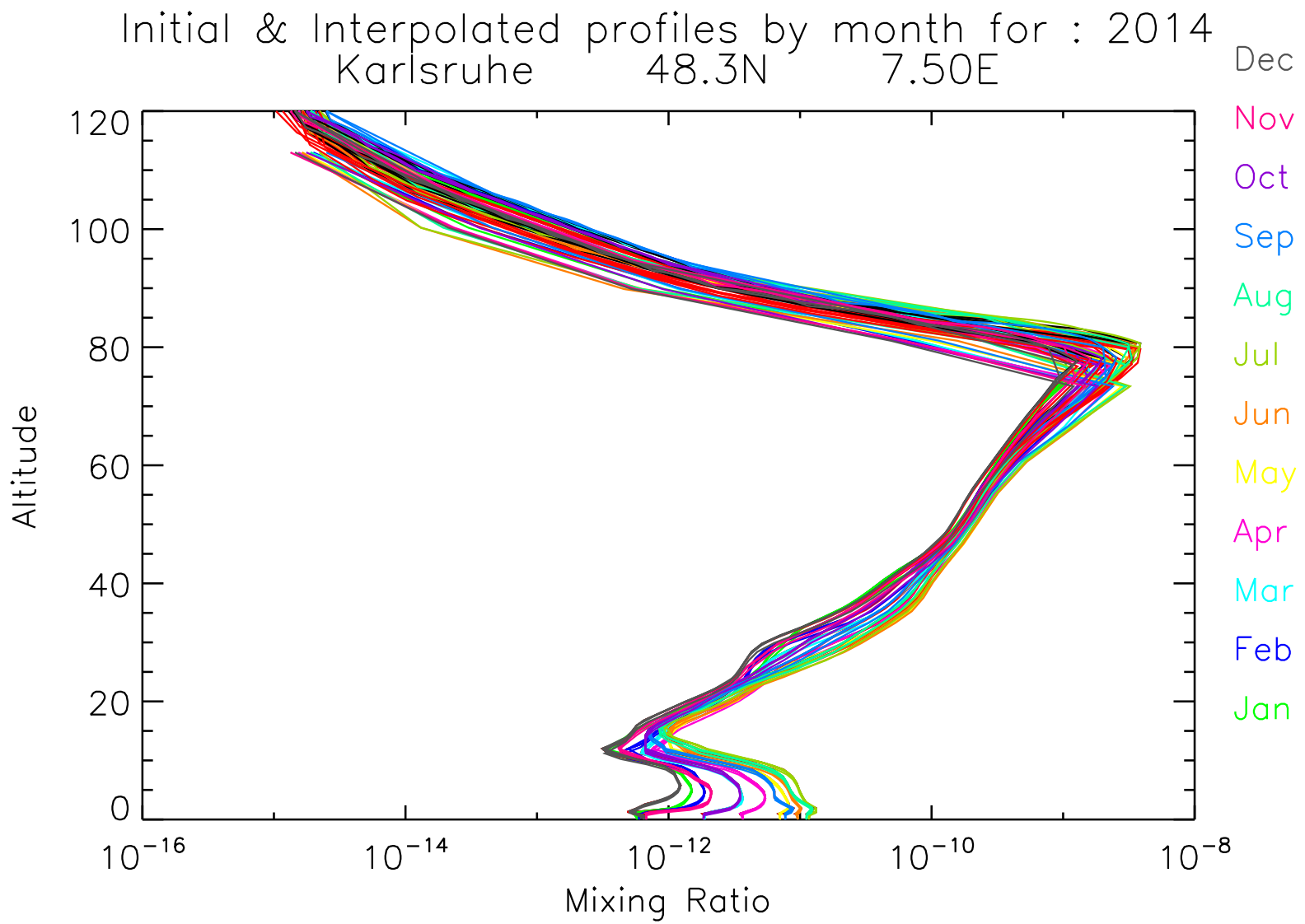
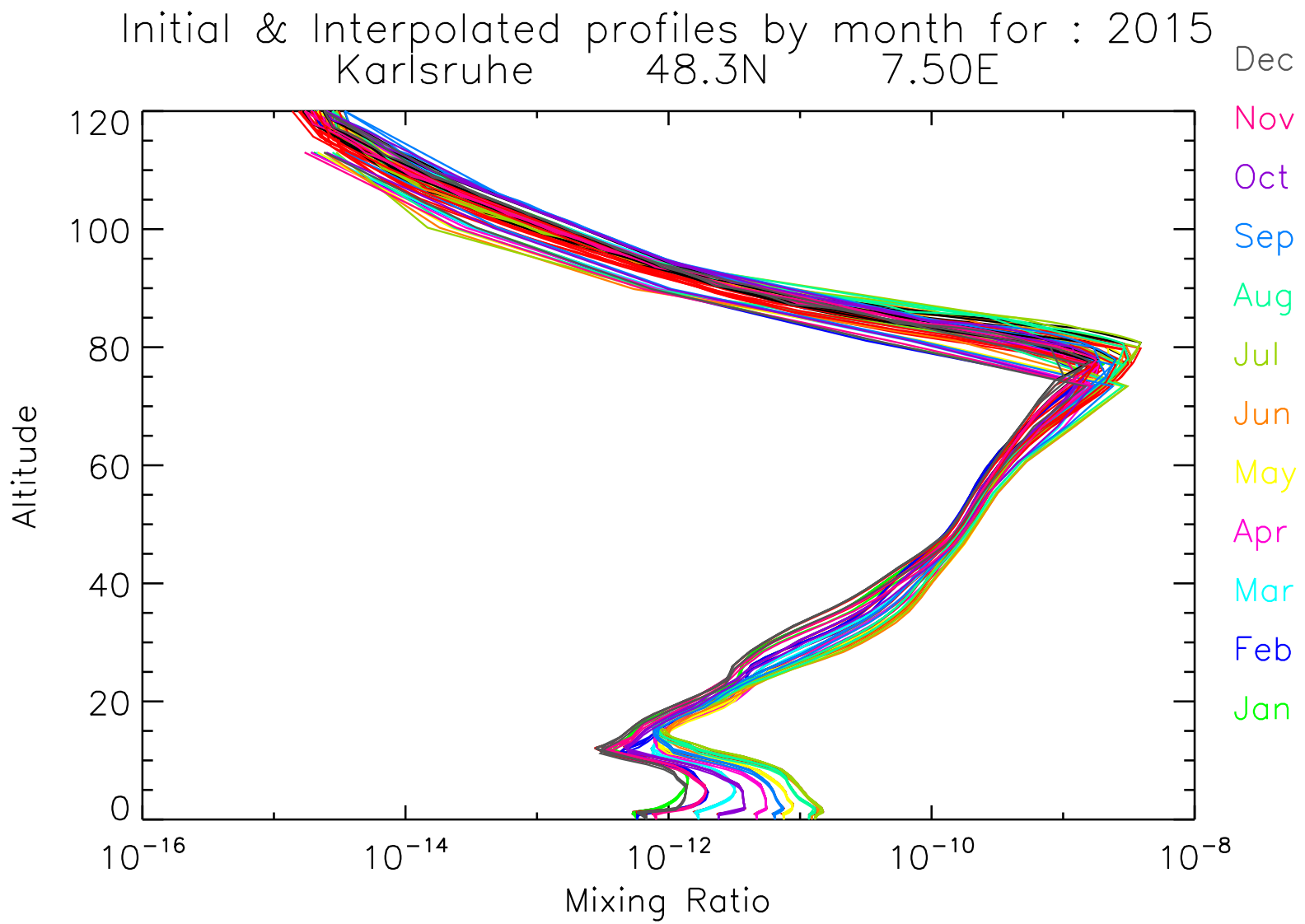
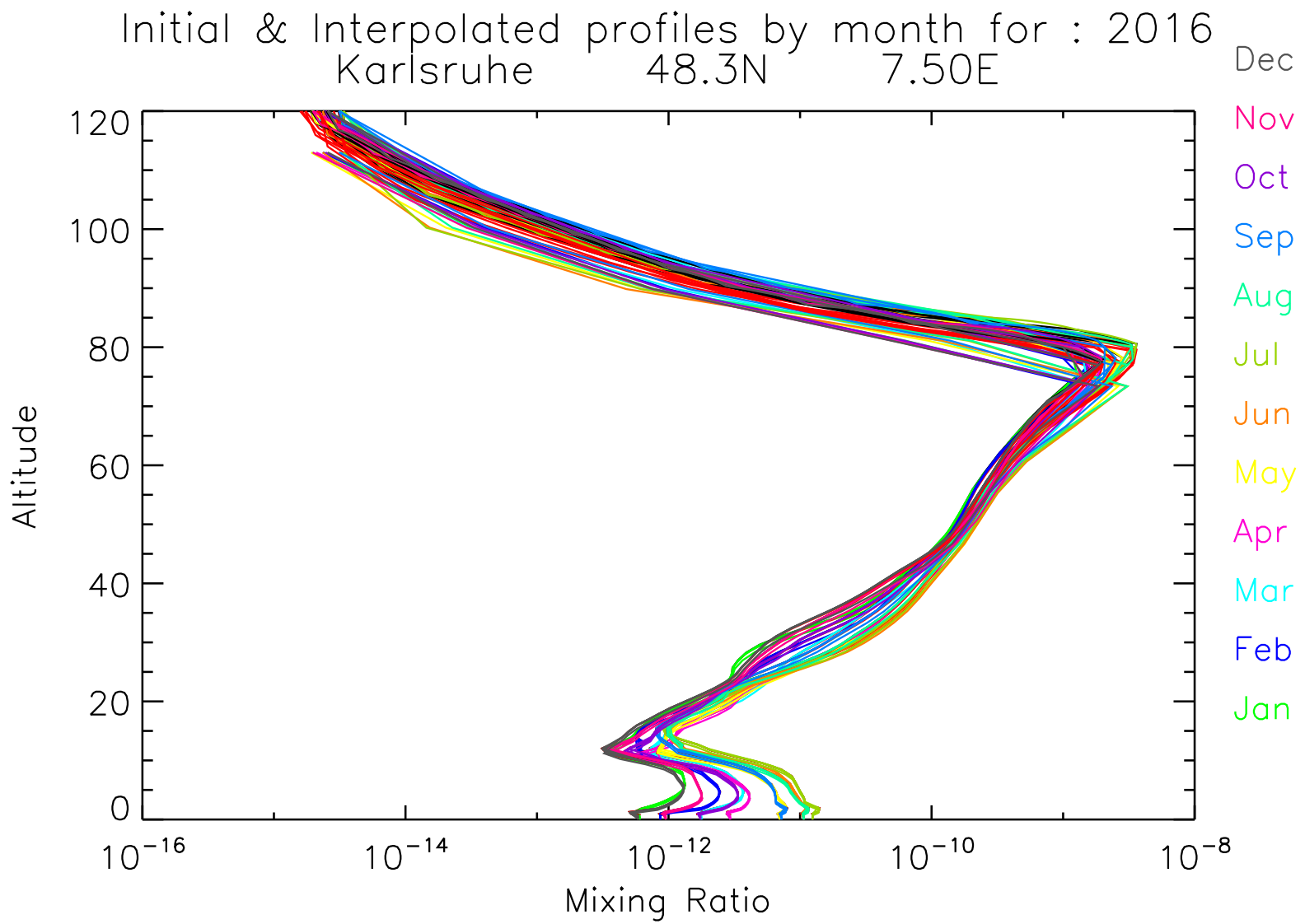
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

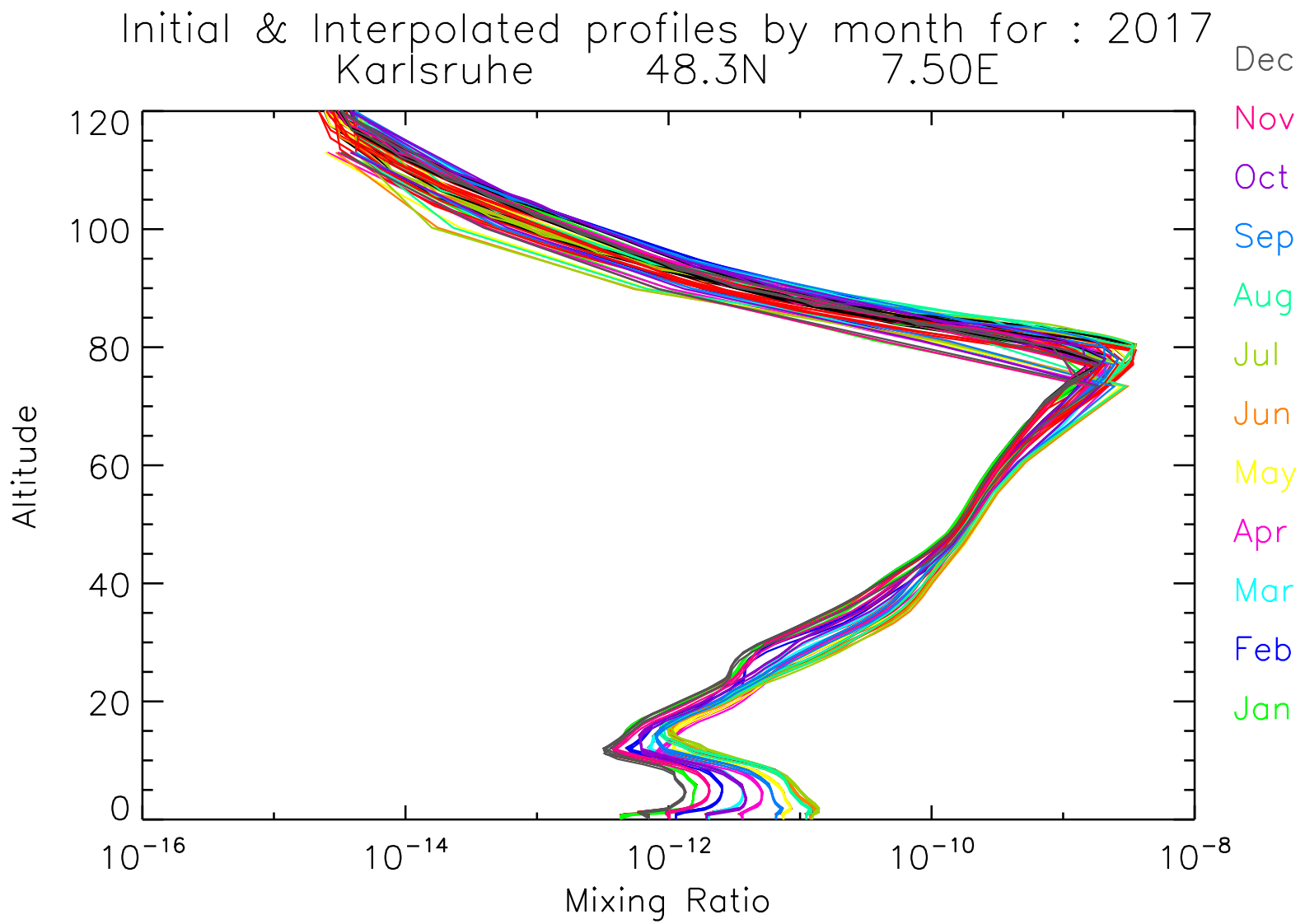

Initial & Interpolated profiles by month for : 2012
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
120
100
80
60
40
20
0
Altitu
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

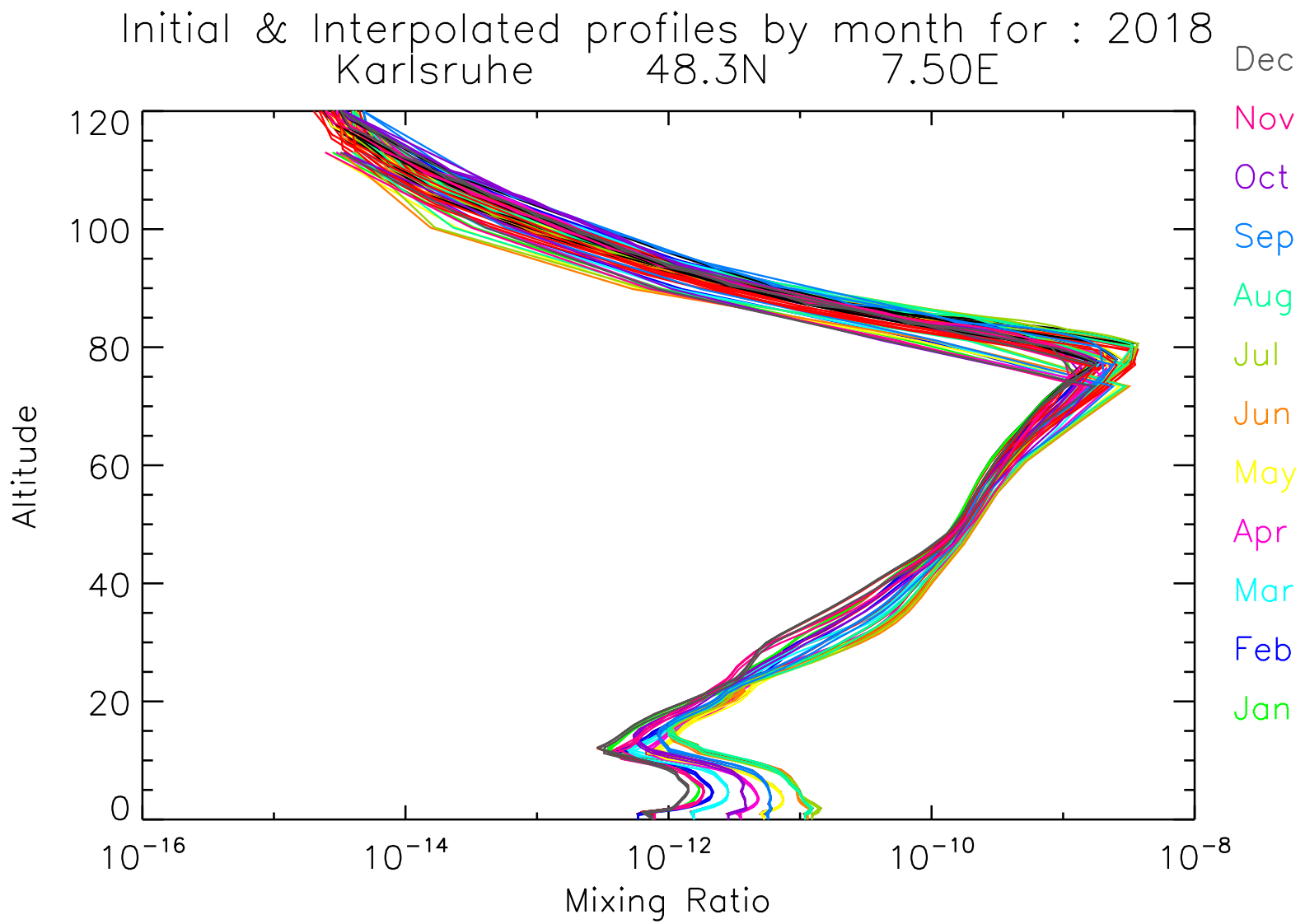

Initial & Interpolated profiles by month for : 2013
Karlsruhe 48.3N 7.50E
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan

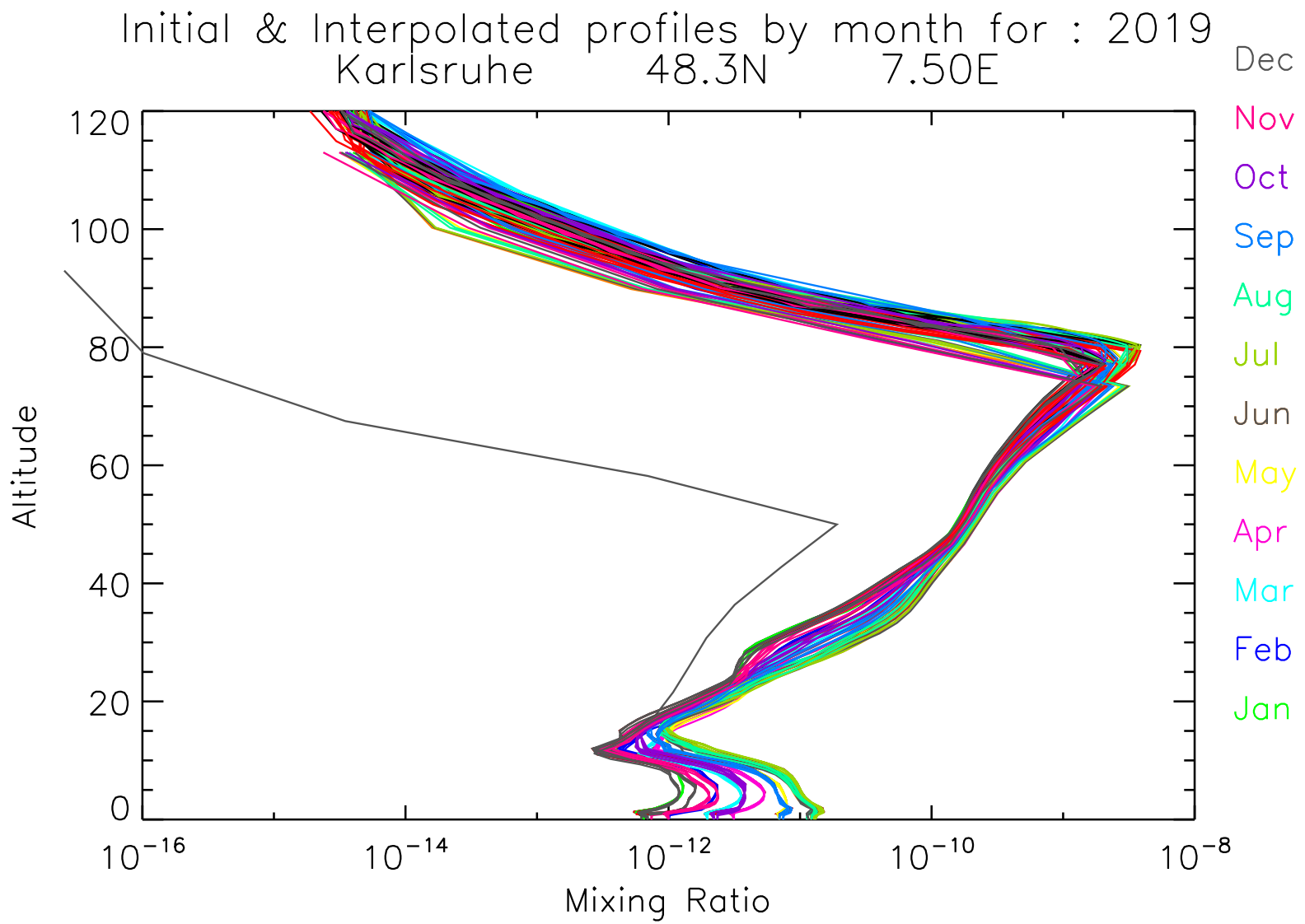

Initial & Interpolated profiles by month for : 2014
Karlsruhe 48.3N 7.50E
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan

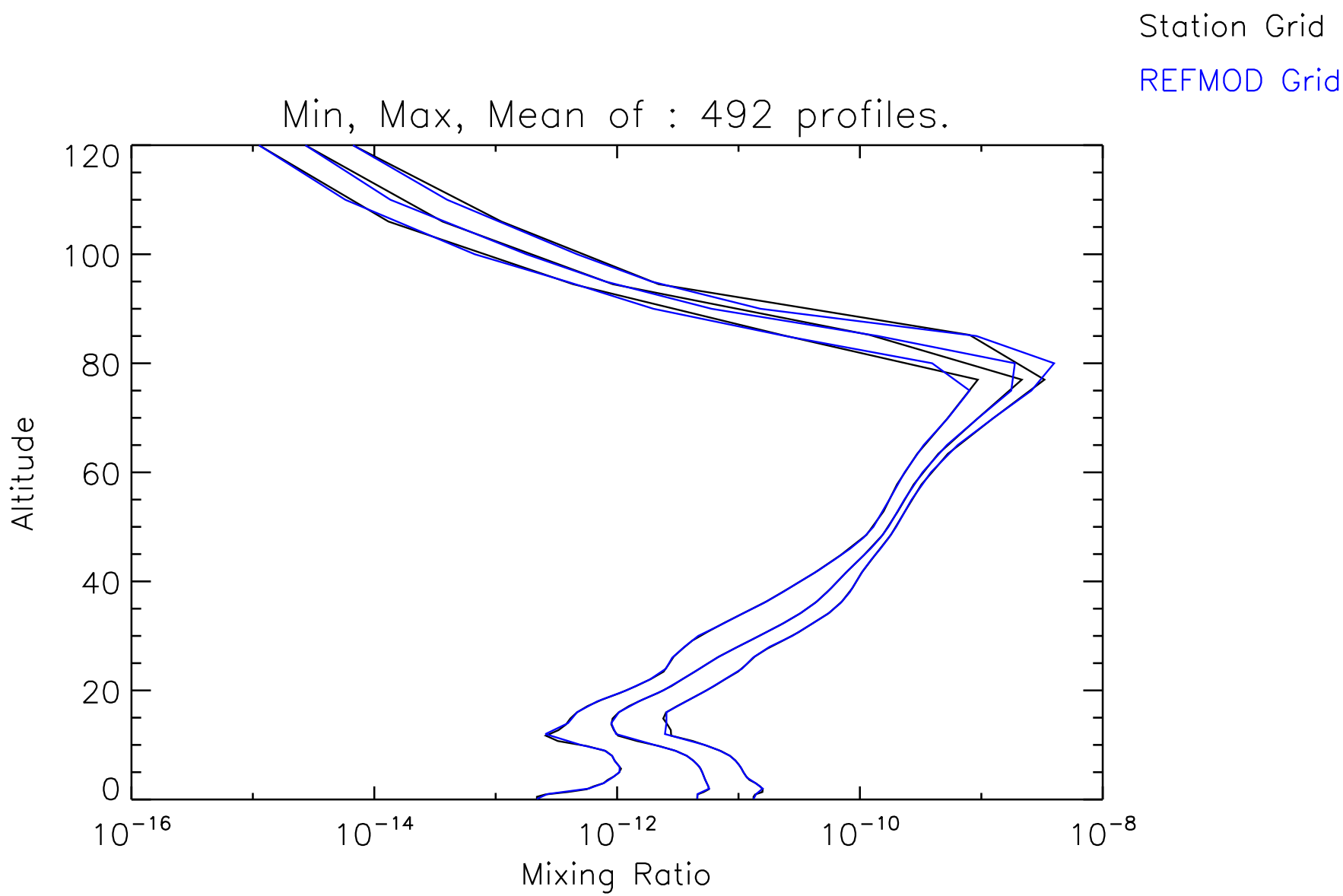

Initial & Interpolated profiles by month for : 2015
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

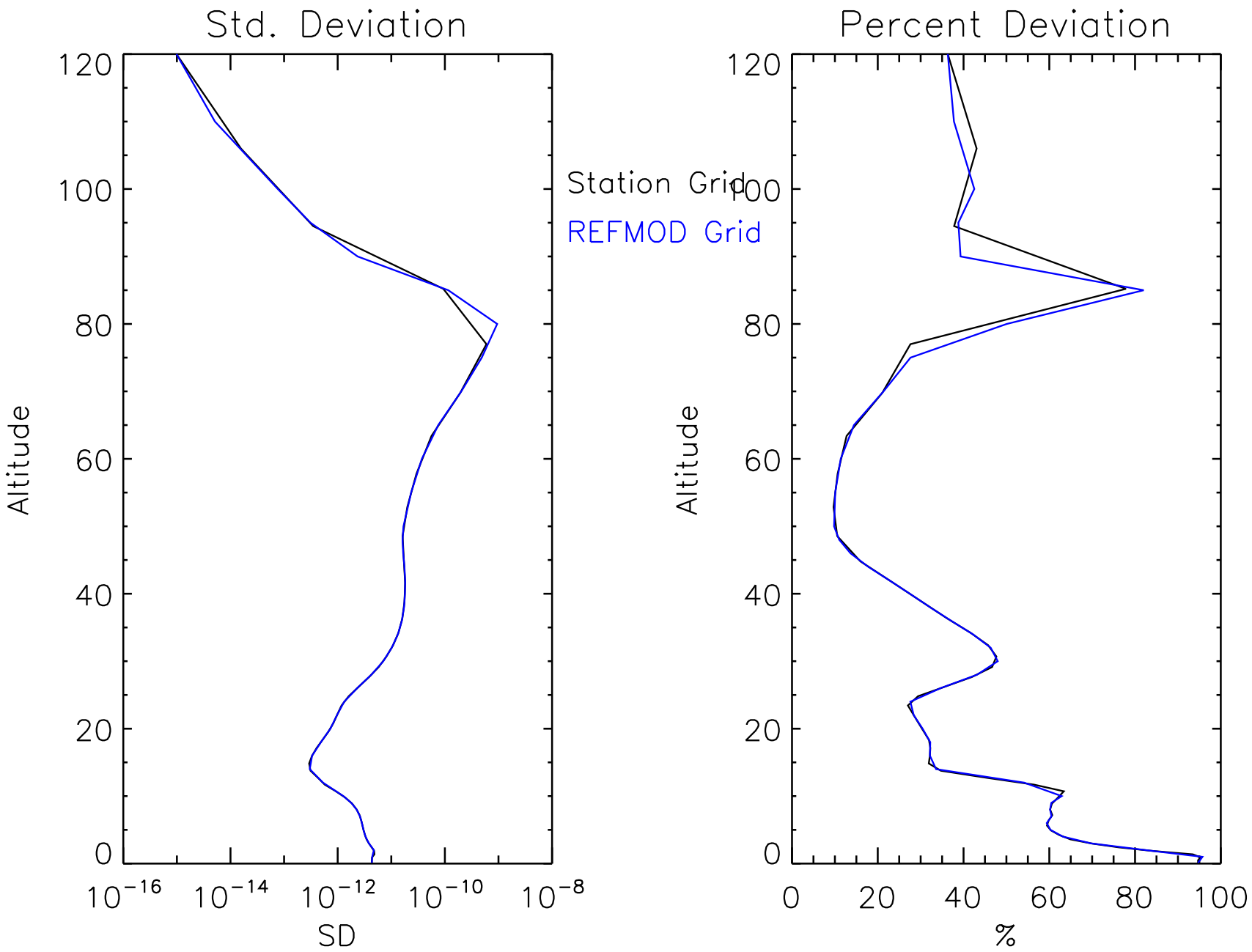

Initial & Interpolated profiles by month for : 2016
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

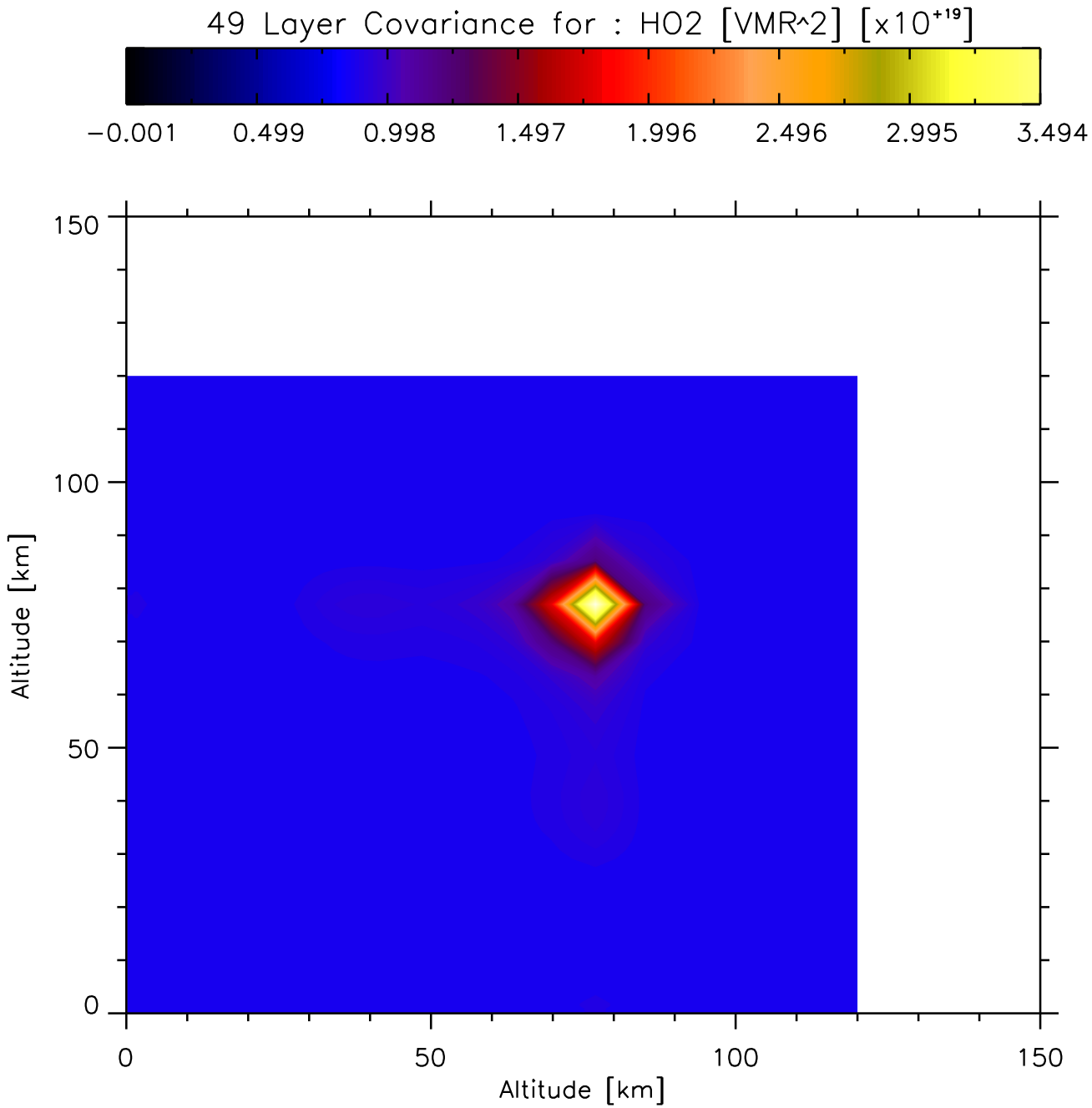

Initial & Interpolated profiles by month for : 2017
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

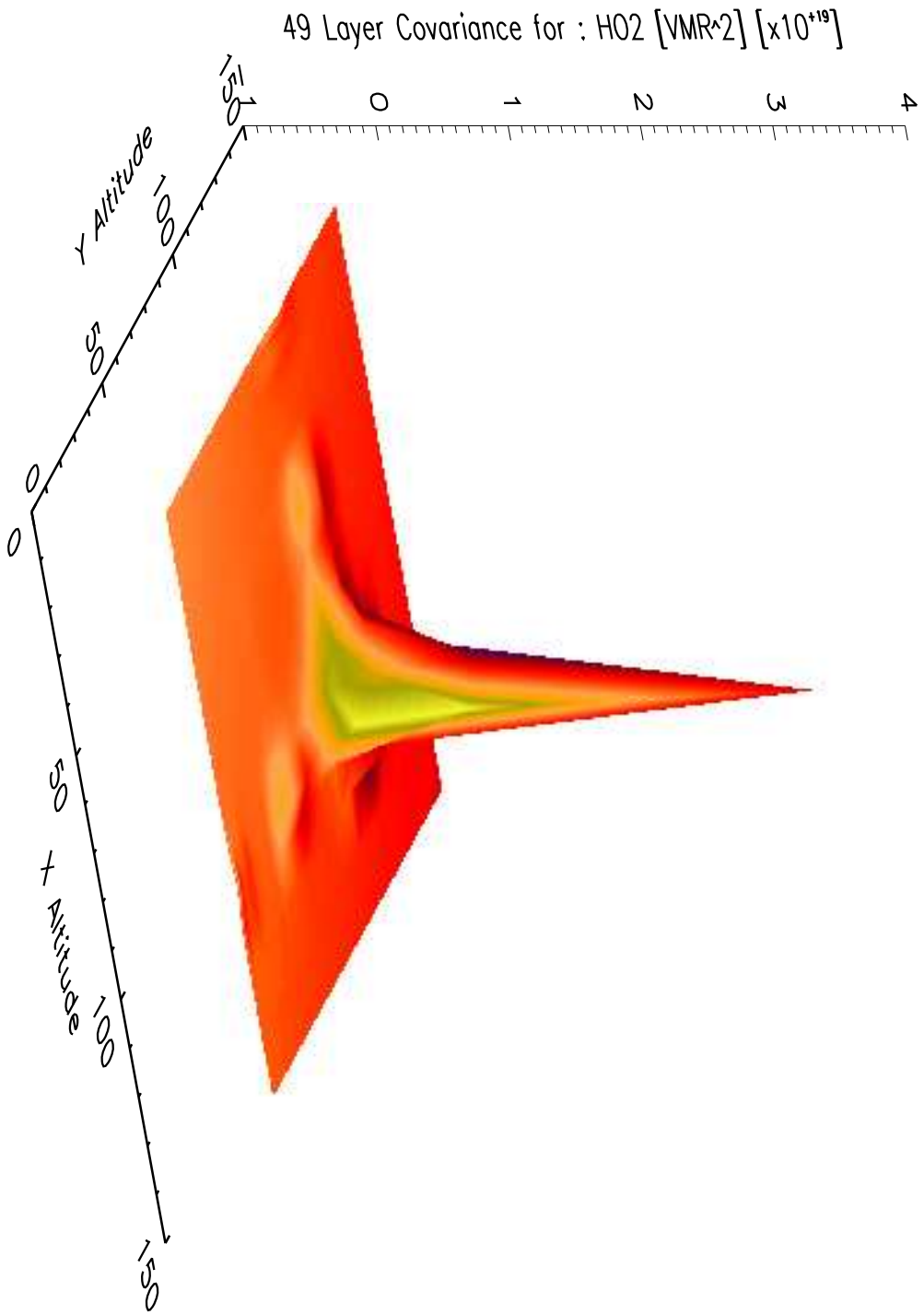

Initial & Interpolated profiles by month for : 2018
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

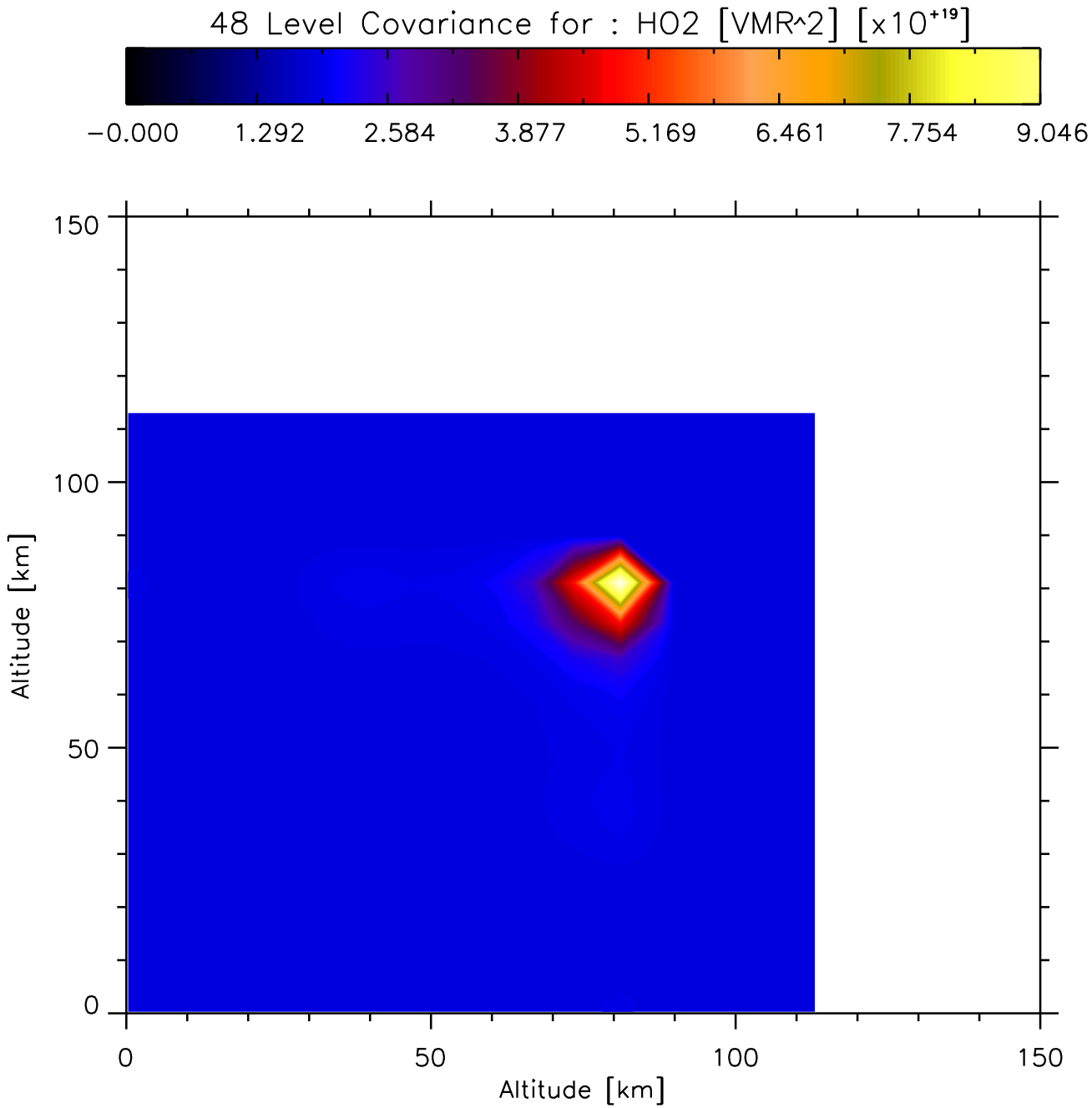

Initial & Interpolated profiles by month for : 2019
Karlsruhe 48.3N 7.50E
Dec
Nov
Oct
Sep
Aug
Jul
Jun
May
Apr
Mar
Feb
Jan
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio

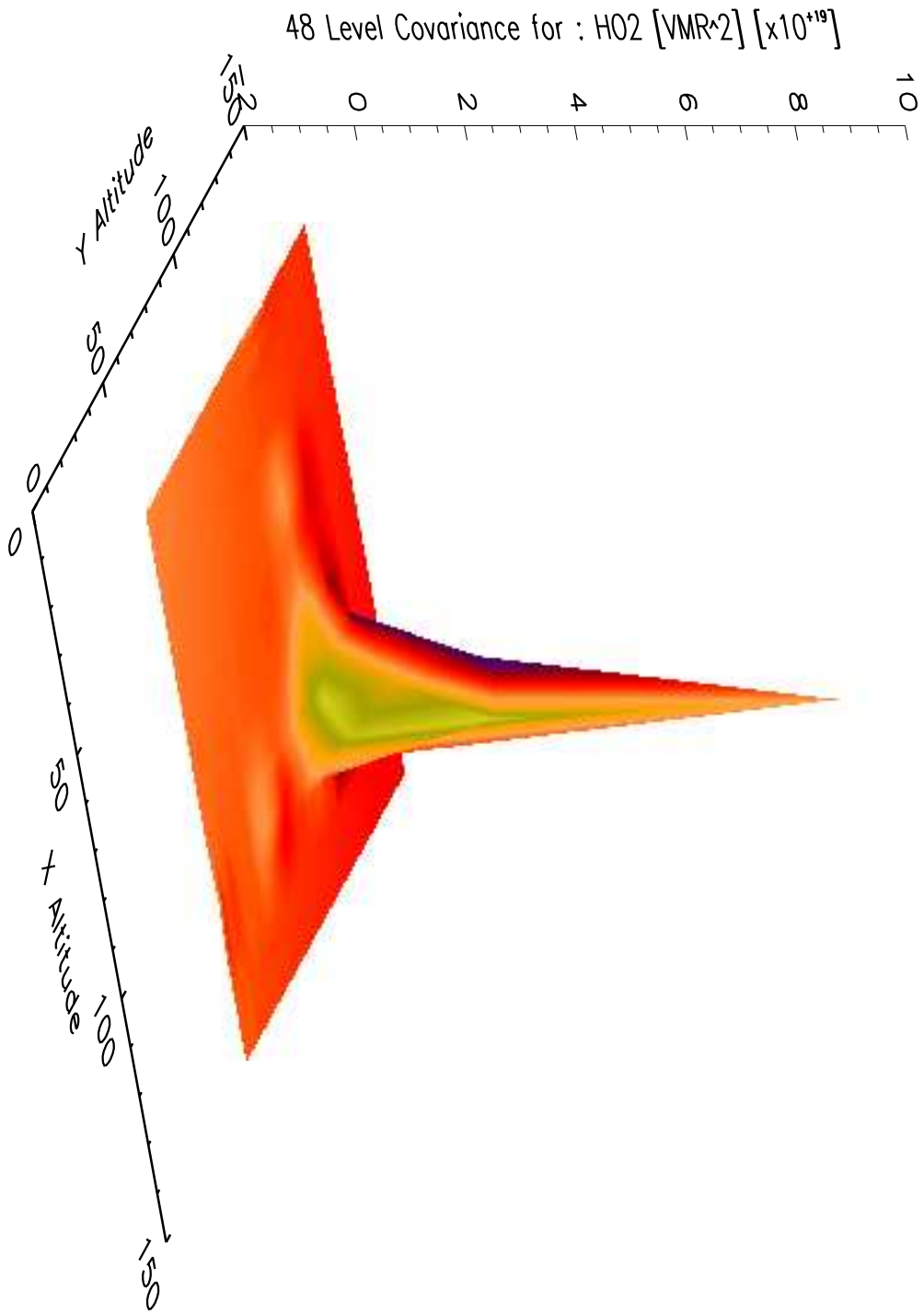

Station Grid
REFMOD Grid
Min, Max, Mean of : 492 profiles.
120
100
80
60
40
20
0
Altitude
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
Mixing Ratio


Std. Deviation
Percent Deviation
Station Grid
REFMOD Grid
Altitude
Altitude
120
100
80
60
40
20
0
10^{-16}
10^{-14}
10^{-12}
10^{-10}
10^{-8}
SD
0
20
40
60
80
100
%


49 Layer Covariance for : HO2 [VMR^2] [x10^+19]
−0.001
0.499
0.998
1.497
1.996
2.496
2.995
3.494
150
100
50
0
Altitude [km]
0
50
100
150
Altitude [km]


49 Layer Covariance for : HO2 [VMR^2] [x10^+19]
0
1
2
3
4
Y Altitude
0
50
100
150
X Altitude
0
50
100
150


48 Level Covariance for : HO2 [VMR^2] [x10^+19]
−0.000
1.292
2.584
3.877
5.169
6.461
7.754
9.046
150
100
50
0
Altitude [km]
0
50
100
150
Altitude [km]


48 Level Covariance for : HO2 [VMR^2] [x10^+19]
-150
0
2
4
6
8
10
Y Altitude
100
50
0
0
50
X Altitude
100
150