Supplement of

Local stratopause temperature variabilities and their embedding in the global context

Ronald Eixmann et al.

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Figure S 1: Vertical profiles of the climatologies (blue) based on the whole MERRA-2 data set (solid) and on the period starting with winter 2004/05 (dashed) as well as the mean STE profiles (red) again based on the whole MERRA-2 data set (solid) and on the period starting with winter 2004/05 (dashed). The green dashed line represents the lidar climatology.

The following figures are similar to Figure 4 in the paper but for all available winter between 1981 and 2019.
Andenes Kühlungsborn

1993

Deviation / Amplitude (K)

20
 10
 0
 10
 20
 30
 40
 50
DoY

Original vs. Reconstruction=-0.025
corr Original vs. Amplitude=-0.392
Original
Reconstruction: wave3
Amplitude: wave3

1994

Deviation / Amplitude (K)

20
 10
 0
 10
 20
 30
 40
 50
DoY

Original vs. Reconstruction=0.641
corr Original vs. Amplitude=-0.405
Original
Reconstruction: wave3
Amplitude: wave3
Andenes Kühlungsborn

1995

20
10
0
10
20
30
40
50
DoY ...

Original vs. Reconstruction=-0.016
corr Original vs. Amplitude=-0.266
Original
Reconstruction: wave3
Amplitude: wave3

1996

20
10
0
10
20
30
40
50
DoY ...

Original vs. Reconstruction=0.628
corr Original vs. Amplitude=-0.135
Original
Reconstruction: wave3
Amplitude: wave3
Andenes Kühlungsborn

1997

![Graphs showing wave patterns from Andenes and Kühlungsborn for 1997.](image1)

1998

![Graphs showing wave patterns from Andenes and Kühlungsborn for 1998.](image2)
1999

Andenes Kühlungsborn

<table>
<thead>
<tr>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Graph" /></td>
<td><img src="image2.png" alt="Graph" /></td>
<td><img src="image3.png" alt="Graph" /></td>
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<td><img src="image11.png" alt="Graph" /></td>
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</tbody>
</table>

2000

Andenes Kühlungsborn

<table>
<thead>
<tr>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
</tr>
</thead>
<tbody>
<tr>
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<td><img src="image23.png" alt="Graph" /></td>
<td><img src="image24.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

Deviation / Amplitude (K)
Andenes Kühlungsborn

2001

20
10
0
10
20
30
40
50

DoY ...

Original vs. Reconstruction = 0.139
corr Original vs. Amplitude = 0.456
Original
Reconstruction: wave 3
Amplitude: wave 3

2002

20
10
0
10
20
30
40
50

DoY ...

Original vs. Reconstruction = 0.500
corr Original vs. Amplitude = 0.387
Original
Reconstruction: wave 3
Amplitude: wave 3
Andenes Kühlungsborn
2015

Deviation / Amplitude (K)

2016

Deviation / Amplitude (K)
wave 1 wave 2 wave 3 wave 123
Andenes Kühlungsborn
2019
20
 10
 0
 10
 20
 30
 40
 50
DoY 2019
40
20
0
20
40
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.975
corr Original vs. Amplitude=0.192
Original
Reconstruction: wave123
Amplitude: wave123
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.639
corr Original vs. Amplitude=0.215
Original
Reconstruction: wave1
Amplitude: wave1
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.630
corr Original vs. Amplitude=-0.061
Original
Reconstruction: wave2
Amplitude: wave2
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.484
corr Original vs. Amplitude=0.248
Original
Reconstruction: wave3
Amplitude: wave3
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.982
corr Original vs. Amplitude=-0.117
Original
Reconstruction: wave123
Amplitude: wave123
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.788
corr Original vs. Amplitude=0.589
Original
Reconstruction: wave1
Amplitude: wave1
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.782
corr Original vs. Amplitude=0.491
Original
Reconstruction: wave2
Amplitude: wave2
20
10
0
10
20
30
40
50
20
10
0
10
20
30
40
50
Deviation / Amplitude (K)
corr Original vs. Reconstruction=0.550
corr Original vs. Amplitude=0.071
Original
Reconstruction: wave3
Amplitude: wave3