Dear Editor,

We hope this message finds you well.

We are writing regarding our manuscript entitled "Influence of Sudden Stratospheric Warming With Elevated Stratopause on the Hydroxyl in the Polar Middle Atmosphere" (MS No.: egusphere-2025-2016), which has been accepted for publication in *Atmospheric Chemistry and Physics* (ACP) and is currently in the proof stage.

During the proof-checking stage, we noticed two small issues carried over from earlier draft materials: (1) several numerical entries in Table 1 that were not fully updated to the final onset dates, and (2) an incorrect date range on the x-axis of panel (h) in Figure 2. Since the paper is currently in the proof stage, the publisher has requested that we explain these corrections to you and obtain your permission. Therefore, we kindly request your approval to replace Table 1 and Figure 2h with their corrected versions during production. Below, we provide our explanation of these changes, together with the relevant attachments for your review.

These modifications are strictly limited to numerical entries in Table 1 and the date labels in Figure 2h. We confirm that all analyses were carried out using the correct onset dates, and all results and conclusions of the manuscript remain unchanged.

We sincerely appreciate your consideration and would be grateful for your approval of these small corrections.

Thank you very much for your time and kind assistance.

Best regards,
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Appendix A: Details of the Proposed Corrections
Appendix B: Explanation of the Above Corrections

Appendix A: Details of the Proposed Corrections

1. Table 1 (Onset Day of the ES-SSW Events During Boreal Winter of 2004-2023)

A few numerical entries were inadvertently retained from a preliminary draft and therefore do not match the onset days indicated by the vertical yellow dashed lines in Figure 2. These vertical yellow dashed lines in Figure 2 mark the reference onset dates (Day 0) used to align the ES-SSW events, which are listed in Table 1. We have prepared an updated version of Table 1 whose onset dates are now fully consistent with those shown in Figure 2 and with all subsequent analyses presented in the paper.

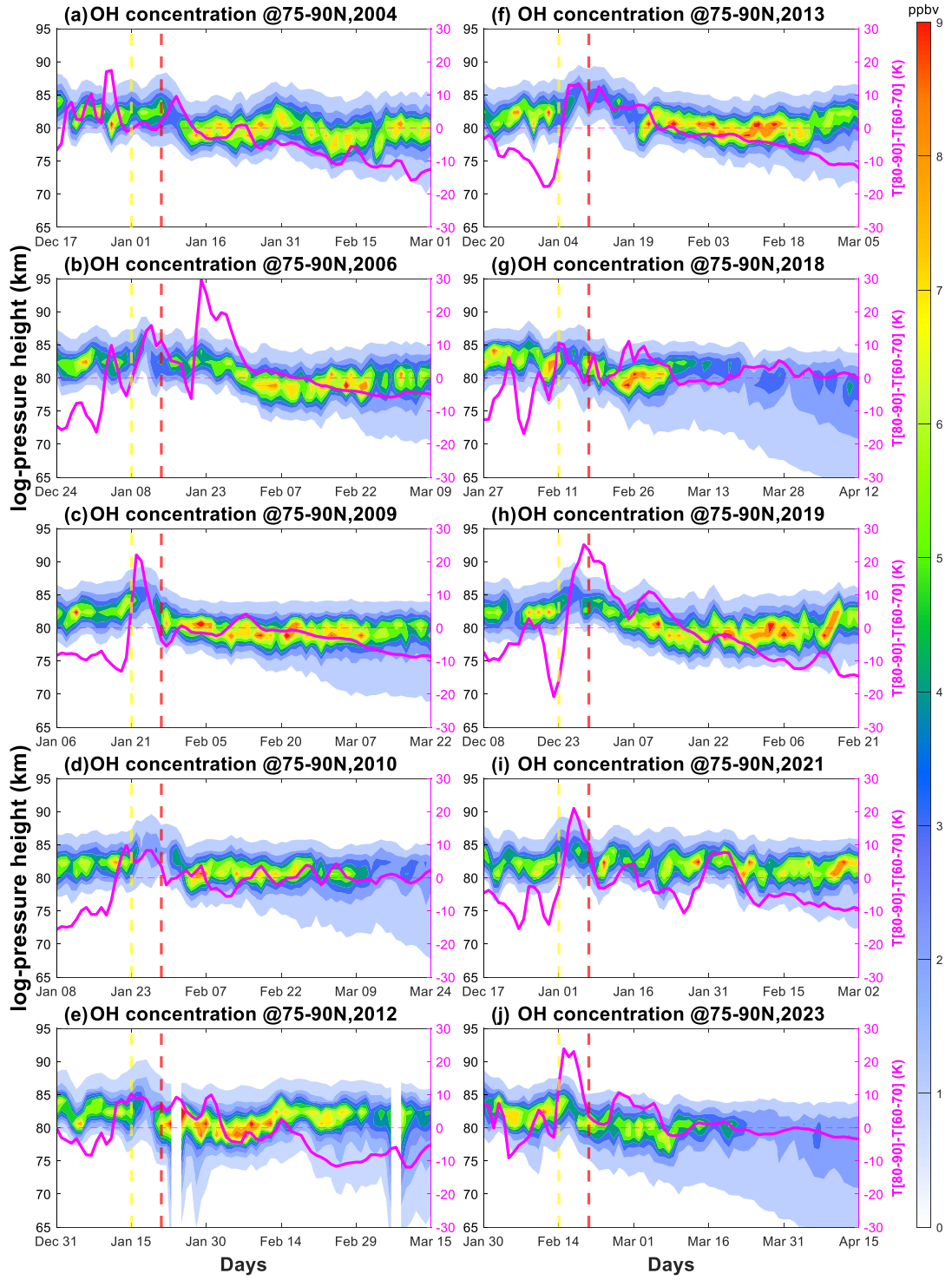
Original draft: Table 1 Onset Day (Day 1 corresponds to January 1 of the Year) of the ES-SSW Events During Boreal Winter of 2004-2023

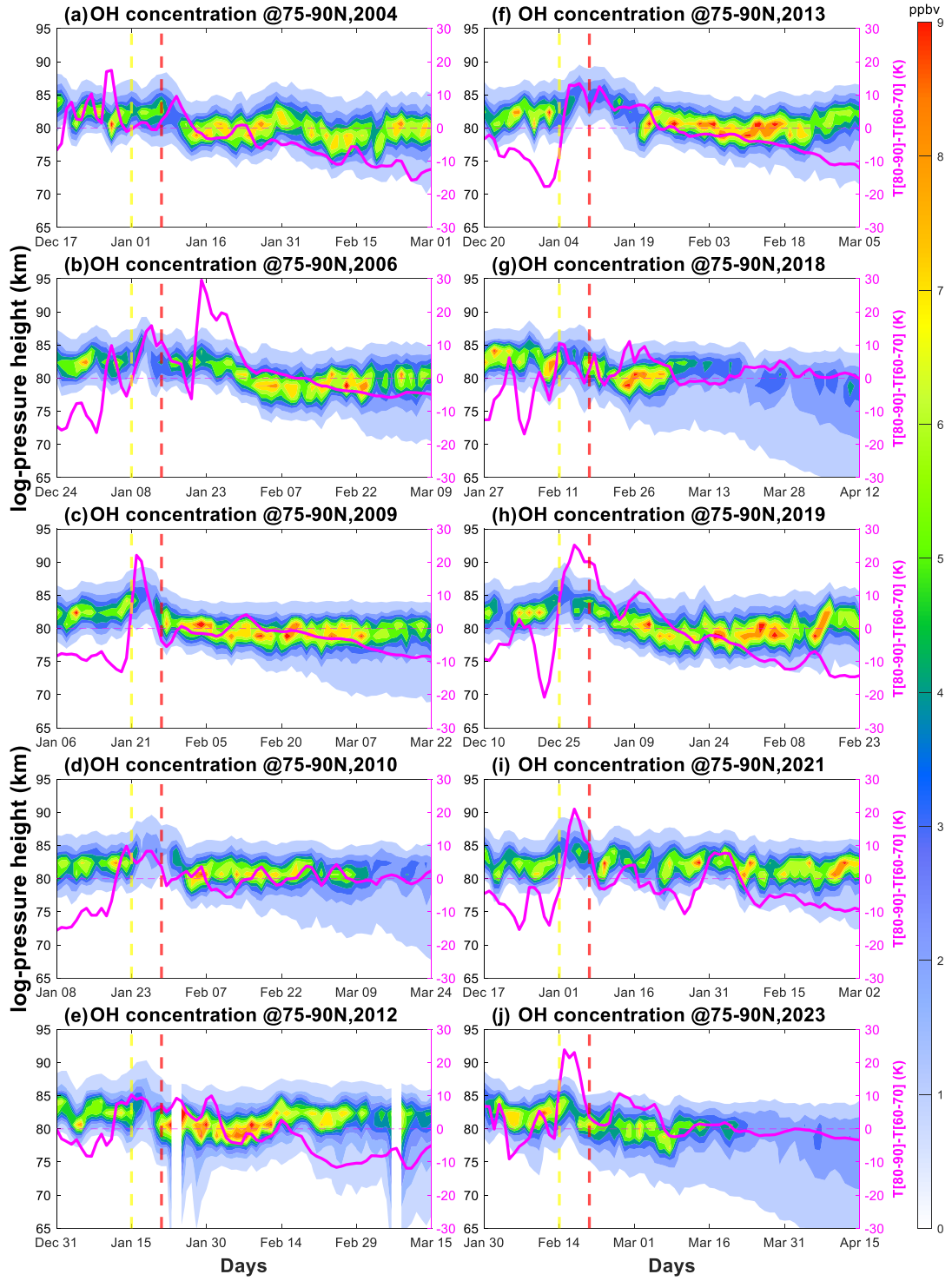
Years	Onset day	Years	Onset day
2003/2004	Jan 2	2012/2013	Jan 5
2005/2006	Jan 9	2017/2018	Feb 14
2008/2009	Jan 21	2018/2019	Dec 25
2009/2010	Jan 20	2020/2021	Jan 2
2011/2012	Jan 11	2022/2023	Feb 13

Revised: Table 1 Onset Day (Day 1 corresponds to January 1 of the Year) of the ES-SSW Events During Boreal Winter of 2004-2023

Years	Onset day	Years	Onset day
2003/2004	Jan 1	2012/2013	Jan 4
2005/2006	Jan 8	2017/2018	Feb 11
2008/2009	Jan 21	2018/2019	Dec 25
2009/2010	Jan 23	2020/2021	Jan 1
2011/2012	Jan 15	2022/2023	Feb 14

2. Figure 2h

In Figure 2, the x-axis labels in panel (h) display an incorrect date range. The correct range should be **"Dec 10-Feb 23"**. We have generated a corrected EPS file for this panel.

Original Figure 2. Time versus log-pressure height cross-sections of OH concentrations in ES-SSW events during 2004-2023 are captured in panels (a)-(j). The solid pink line represents the meridional temperature difference between 60-70 and 80-90° N ($T[80°-90°]-T[60°-70°]$). Vertical dashed yellow and red lines are the onset of the stratosphere warming stage and elevated stratopause stage, respectively.

Updated Figure 2:

Updated Figure 2. Time versus log-pressure height cross-sections of OH concentrations in ES-SSW events during 2004-2023 are captured in panels (a)-(j). The solid pink line represents the meridional temperature difference between 60-70 and 80-90° N (T[80°-90°]-T[60°-70°]). Vertical dashed yellow and red lines are the onset of the stratosphere warming stage and elevated stratopause stage, respectively.

Appendix B: Explanation of the Above Corrections

In the early stage of this work (**before the initial submission of this manuscript**), we tested two commonly used definitions of SSW onset in the previous literature (e.g., Butler et al., 2015; Charlton & Polvani, 2007), one based on the reversal of the meridional temperature difference and the other based on the reversal of the zonal-mean zonal wind. As we explained to Referee 2 during the first-round review (see Figure R2 in the Author's Response File for the first-round review), these two definitions can differ by a few days for a given event.

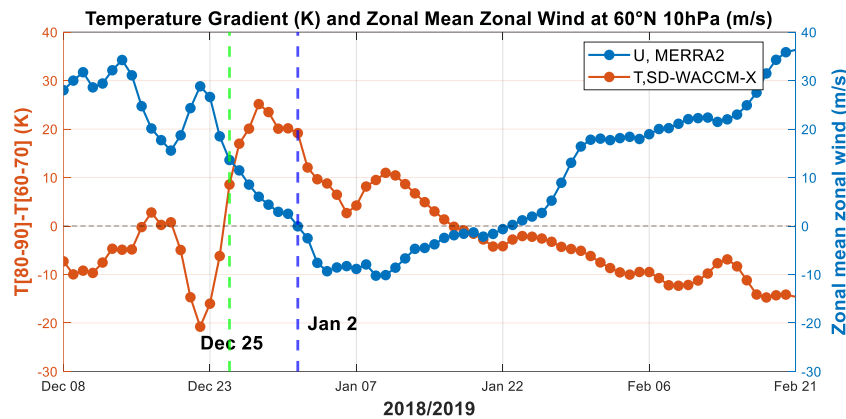



Figure R2 in the Author's Response File for the first-round review. Temporal variation of the temperature difference between 60°N and 90°N at 10 hPa (red line) and the zonal-mean zonal wind at 60°N and 10 hPa (blue line). Vertical dashed green and blue lines denote the onset of the positive temperature difference and the zonal wind reversal, respectively.

For the final analysis presented in the manuscript, we adopted the temperature-difference-based onset as our consistent definition. ***Importantly, from the initial submission, the vertical yellow dashed lines in Figure 2 already marked the onset days defined by the temperature difference (Day 0), and all analyses in the paper have been carried out using this definition.***

The inconsistency in Table 1 arose because a few onset dates based on the wind-reversal definition were inadvertently retained from an early draft and were not updated to the temperature-difference-based values. This led to a mismatch between some of the onset days listed in Table 1 and the yellow dashed lines in Figure 2. We sincerely apologize for this oversight. In the corrected version, all onset days in Table 1 have been updated to match the temperature-difference-based onset dates used in Figure 2 and in all subsequent analyses.

Separately, the x-axis range in Figure 2h was set incorrectly during figure preparation; the correct range should be "Dec 10-Feb 23". We have corrected the date labels in the updated EPS file. This change is purely a display correction and does not affect any of the underlying results.

These adjustments are limited to ensuring numerical and labeling consistency across different draft versions of the materials. All analyses using Day 0 were already based on the correct (temperature-difference-based) onset dates shown in Figure 2, *so these corrections do not affect any results, and all other analyses and conclusions in the manuscript remain unchanged.*

References:

Butler, A. H., Seidel, D. J., Hardiman, S. C., Butchart, N., Birner, T., and Match, A.: Defining sudden stratospheric warmings, Bulletin of the American Meteorological Society, 96, 1913–1928. https://doi.org/10.1175/Bams-D-13-00173.1, 2015.

Charlton, A. J. and Polvani, L. M.: A new look at stratospheric sudden warmings. Part I: Climatology and modeling benchmarks, Journal of Climate, 20, 449–469, https://doi.org/10.1175/Jcli3996.1, 2007.