

1 **Supplemental Material:**

2 **Impact of Antarctic Ozone Hole on the Vertical Coupling of the**  
3 **Stratosphere-Mesosphere-Lower Thermosphere System**

4 SANDRO W. LUBIS \*

*GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany*

5 NOUR-EDDINE OMRANI

*Geophysical Institute, University of Bergen and Bjerknes Centre for Climate Research, Bergen, Norway*

*GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany*

6 KATJA MATTHES

*GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany, and*

*Christian-Albrechts Universität zu Kiel, Kiel, Germany*

7 SEBASTIAN WAHL

*GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany*

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\* *Corresponding author address:* Sandro W. Lubis, GEOMAR Helmholtz Centre for Ocean Research Kiel, Düsternbrooker Weg. 20, 24105 Kiel, Germany. E-mail: slubis@geomar.de

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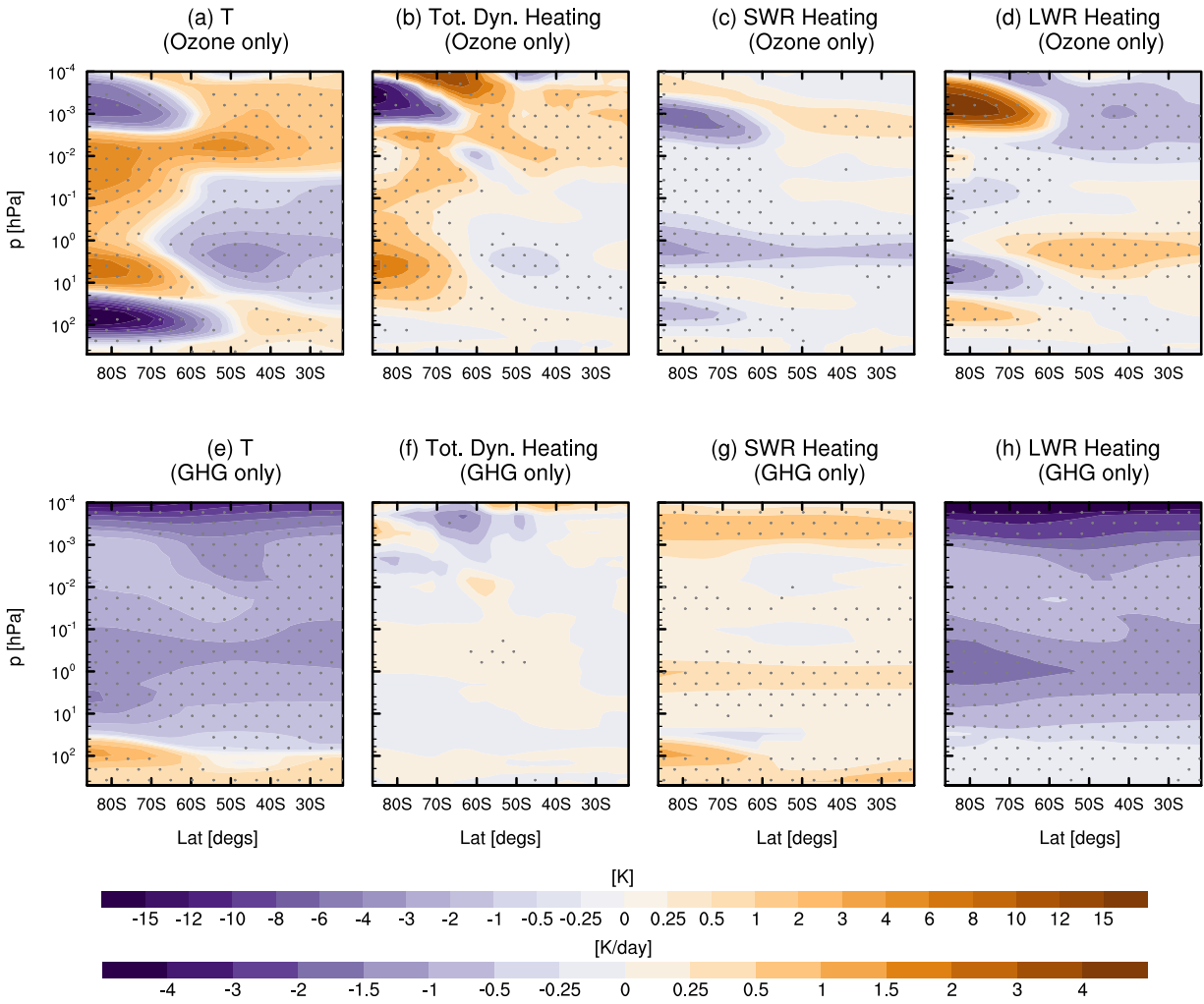


FIG. 1. [S1]. As in Fig. 5, but for timeslice experiments: (a-d) REF-TS minus GHG2010-TS (impact of ozone depletion only) and (e-h) REF-TS minus ODS2010-TS (impact of GHG only) for averaged years 1990-2030.

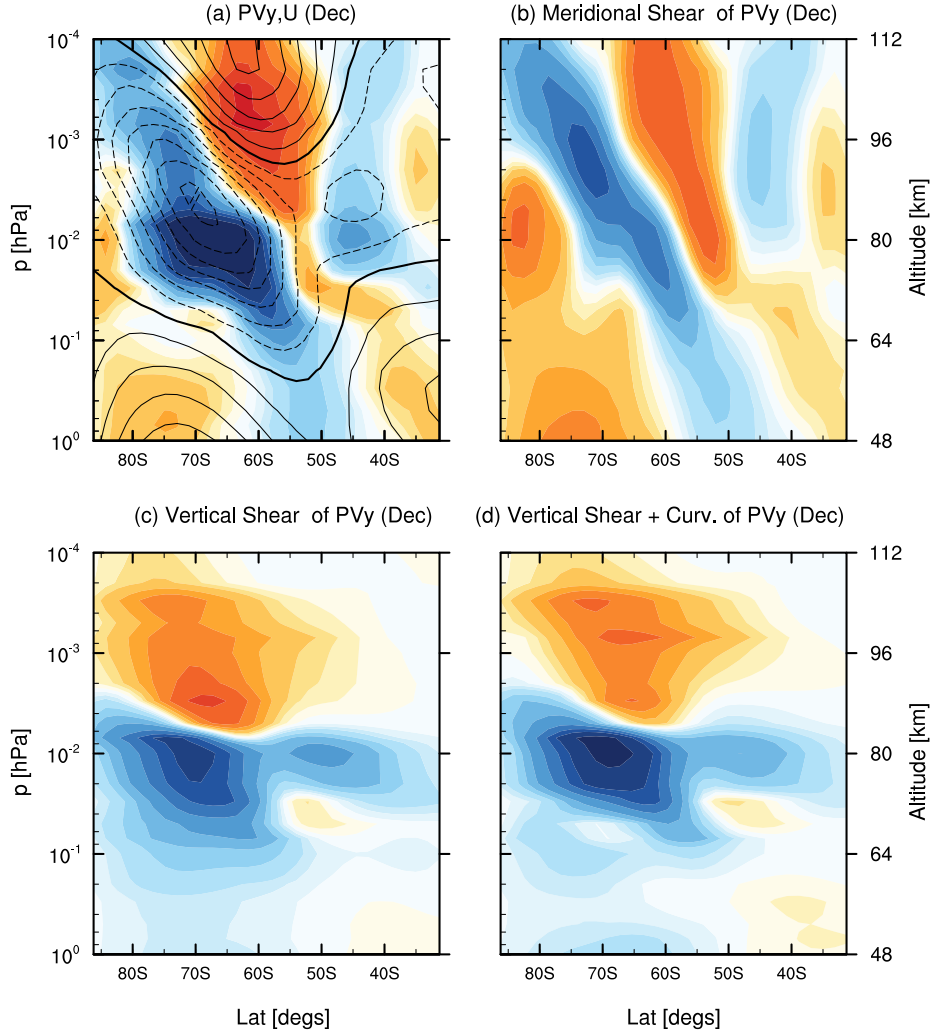


FIG. 2. [S2]. (a) Meridional PV gradient  $[q]_y$  differences between GHGODS-TR minus CTL-TR for averaged years 1990-2030 and (c-d) its decomposition into meridional shear terms  $-a^{-2}(\cos \phi^{-1}([u] \cos \phi)_\phi)_\phi$ , vertical shear terms  $(f^2(HN^2)^{-1} + (f^2N^{-4})N_z^2)^{-1}[u]_z$ , and vertical curvature term  $-f^2N^{-2}[u]_{zz}$  in December from the transient simulation (GHGODS-TR minus CTL-TR).