Figure S1. Latitude-height zonal wind difference between REF and NoODS (a, b and c) and between REF and NoGHG (d, e and f) for October (a and d), November (b and e) and December (c and f) in m s^{-1} (color shading). Stippling masks values that are not significant at the 95% confidence interval. The overlaying contours mark the 1958-2013 climatology of each respective month from REF.
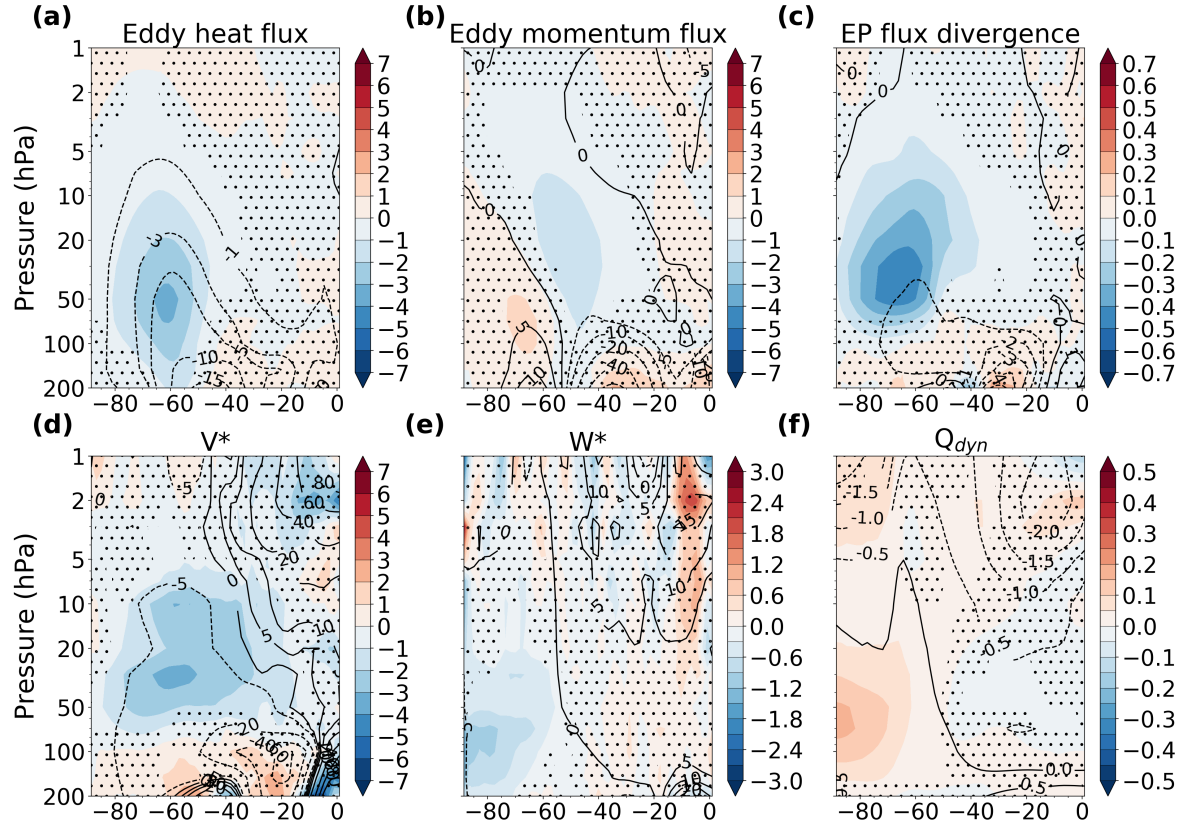
Figure S2. Latitude-height December difference between REF and NoODS in the eddy heat flux (a, in K m s^{-1}), the eddy momentum flux (b, in m^{2}s^{-2}), the divergence of the EP flux (c, in m s^{-1} day^{-1}), the meridional residual velocity (d, in 10^{-2}m s^{-1}), the vertical residual velocity (e, in 10^{-4}m s^{-1}) and in the dynamical heating rate (f, in K day^{-1}) for the period 1958-2013 (color shading). Contours in each panel show the corresponding climatology from REF. Stippling masks values that are not significant at the 95% confidence interval.
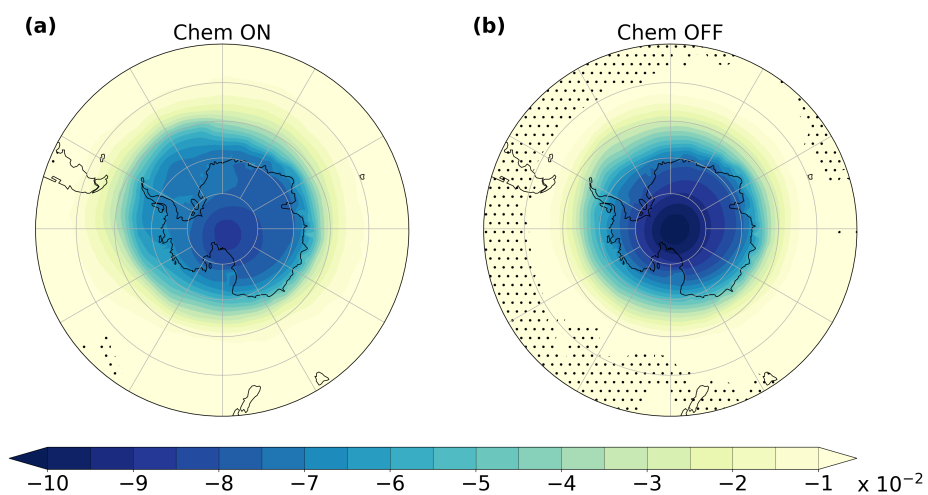
Figure S3. Polar stereographic maps of the October 70 hPa trends in SW heating rate for Chem ON (a) and Chem OFF (b) in K day^{-1} dec^{-1} for the period 1958-2013. Stippling masks regions where the trends are not significant at the 95% confidence level. Note that the scale is multiplied by 10^{-2}.