

Figure S1. Time-height sections of wave activity for wavenumbers 4-5 at 50°N, in terms of the amplitude of the individual harmonics of pressure anomalies, relative to the mean pressure of each vertical level (colours). Magenta line denotes the zonal-mean TP_z . Grey solid lines denote westerly zonal winds, with 10 ms⁻¹ separation. Thick black solid and dashed lines denote 0 ms⁻¹, -3 ms⁻¹ and -10 ms⁻¹, respectively. To improve visibility, the ERA-Interim zonal-mean zonal wind is displayed with a running mean of +-15 days. Same as Fig. 2 from the main manuscript, but focused on w4/w5, winter/spring time and with extended vertical range.



Figure S2. Same as in Fig. S1 but for the 2010 SSW case.



Figure S3. Same as in Figs. S1 and S2 but for the 2013 SSW case.



Anticorrelation of Temp. signals between UT and LS

Figure S4. Probability density functions of the UT-LS temperature correlation -vs- wave amplitudes for RWPs (w4-8, left column) and planetary waves (w1-2, right column) at mid-latitudes (top row) and the subtropics (bottom row). Same as Fig. 11 in the main manuscript, but for the Southern hemisphere.