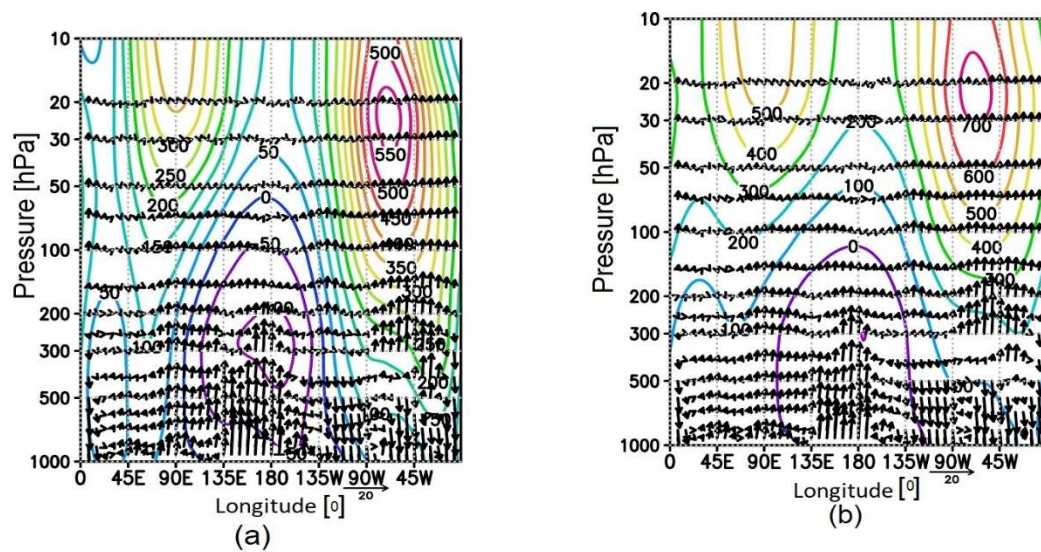


**Figure S1.** Altitude-longitude cross-section of geopotential height difference (gpm) in the latitudinal belt 45° N - 75° N (a), polar projections at the pressure levels 200 hPa (b) and 500 hPa (c) in February between “warm” and “cold” composites of 7 and 13 winters (d, e, f respectively).



**Figure S2.** Altitude-longitudinal cross-section of difference between geopotential height (contours) and vertical component  $F_z$  (vectors) averaged over 55° N - 75° N and 60° N - 80° N of “warm” and “cold” composites (a, b).  $F_z$  is multiplied by 100.