Supplement of

Dynamics of the Asian Summer Monsoon Anticyclone: Insights from Potential Vorticity Tendency Diagnostics

Table S1. Statistics of vortices in each month of boreal summer from 2000-2020

	Time	Overall	Persistent Vortex		Transient Vortex	
		Count	Count	Percentage	Count	Percentage
ERA5 (2000-2020)	Total	24940	16370	65.64%	8570	34.36%
	May	4012	2179	54.31%	1833	45.29%
	June	4510	2805	62.20%	1705	37.80%
	July	5272	3703	70.24%	1569	29.76%
	August	5655	4096	72.43%	1559	27.57%
	September	5491	3587	65.33%	1904	34.67%
JRA-3Q (2000-2020)	Total	24702	16099	65.17%	8603	34.83%
	May	3931	2023	51.46%	1908	48.54%
	June	4466	2801	62.72%	1665	37.28%
	July	5231	3716	71.04%	1515	28.96%
	August	5607	3975	70.89%	1632	29.11%
	September	5467	3584	65.56%	1883	34.44%
Merra2 (2000-2020) ASM	Total	25579	14448	56.48%	11131	43.52%
	May	4067	2023	49.74%	2044	50.26%
	June	4774	2463	51.59%	2311	48.41%
	July	5234	2998	52.28%	2236	42.72%
	August	5906	3707	62.77%	2199	37.23%
	September	5598	3257	58.18%	2341	41.82%
CIESM/BASE (2000-2018)	Total	23551	15797	67.08%	7754	32.92%
	May	3882	2362	60.84%	1520	39.16%
	June	3921	2783	70.98%	1138	29.02%
	July	5390	3552	65.90%	1838	34.10%
	August	5409	3649	67.46%	1762	32.54%
	September	4949	3451	69.73%	1798	30.27%

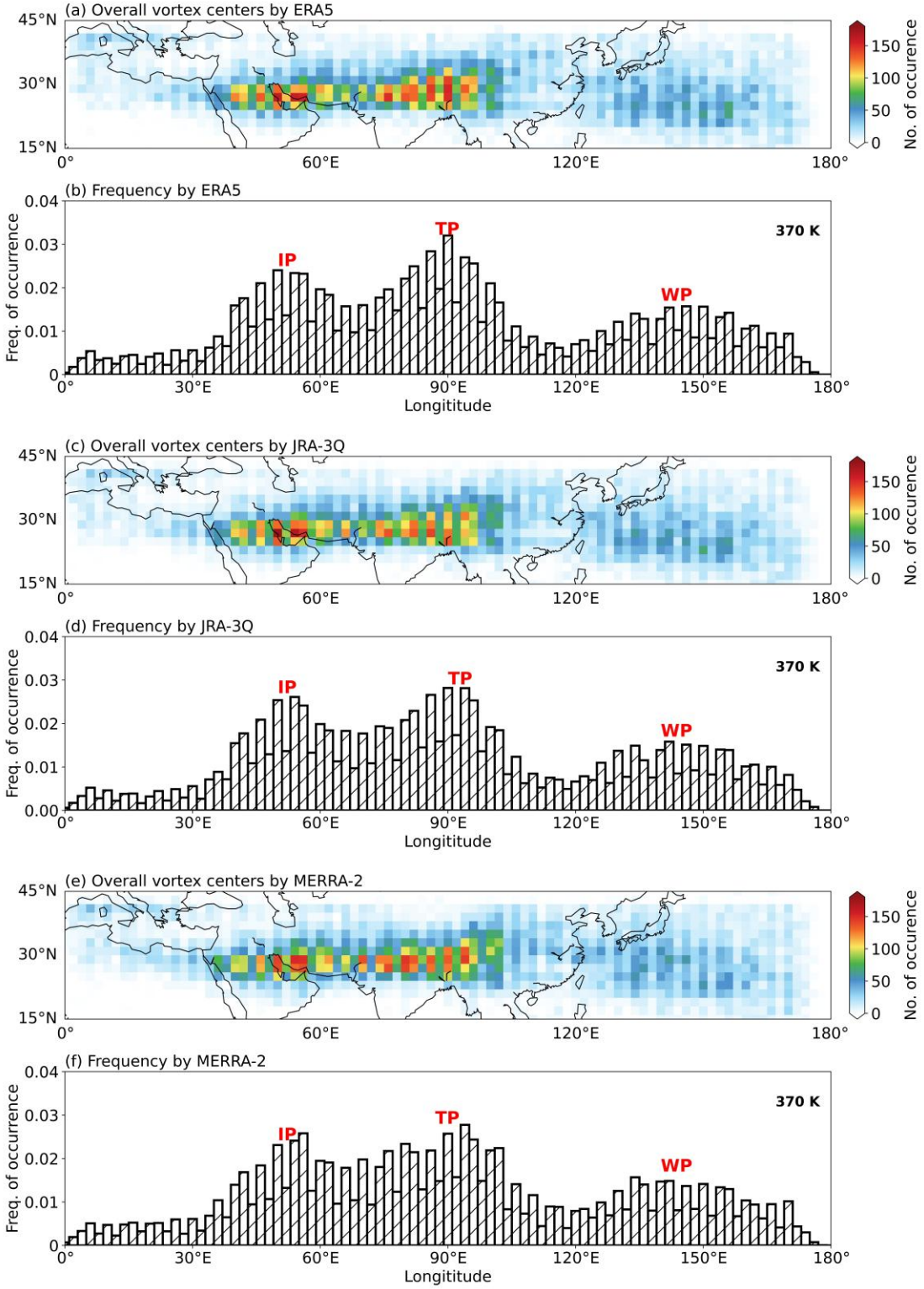

Figure S1. The spatial distributions of occurrence frequency of the anticyclone centers at isentropic 370 K using (a, b) ERA5, (c, d) JRA-3Q, (e, f) MERRA-2, during May–September 2000–2020. The "IP" refers to the Iranian Plateau mode, "TP" refers to the Tibetan Plateau mode, and "WP" refers to the Western Pacific mode.

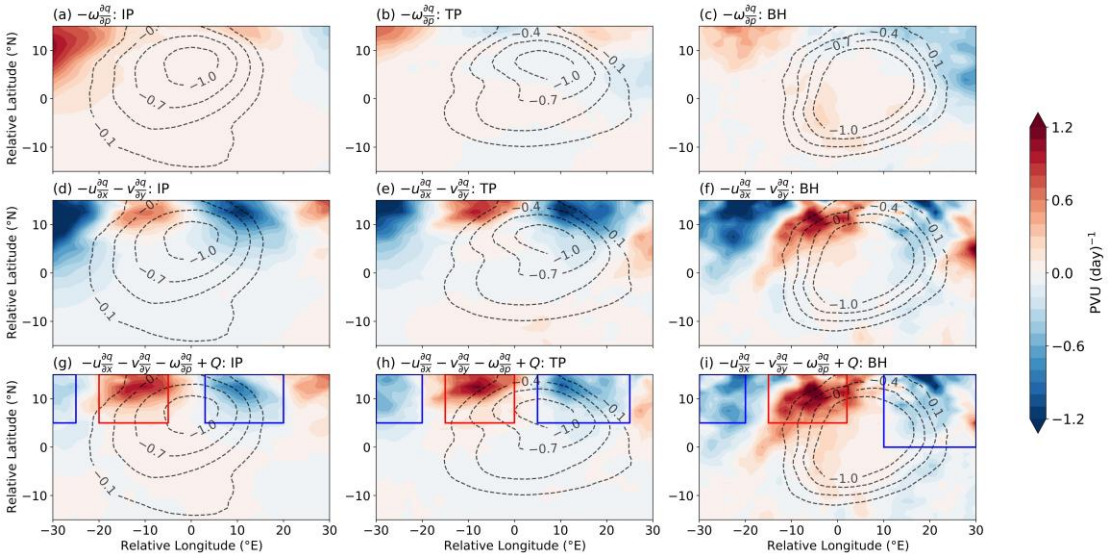

Figure S2. The PV tendency from (a)-(c) vertical advection, (d)-(f) horizontal advection, and (g)-(i) sum of each term from three modes on 200 hPa. The black dashed contours show the PV anomaly at 100 hPa which contours from -1 to 0 PVU with interval of 0.3 PVU. The longitudinal and latitudinal extents are the main area of anticyclone, with the red box indicating the main area of divergence, while the blue boxes signify additional zones of divergence.