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Supplement of

A new method for estimating atmospheric turbulence from global high-resolution radiosonde data and comparison with the Thorpe method

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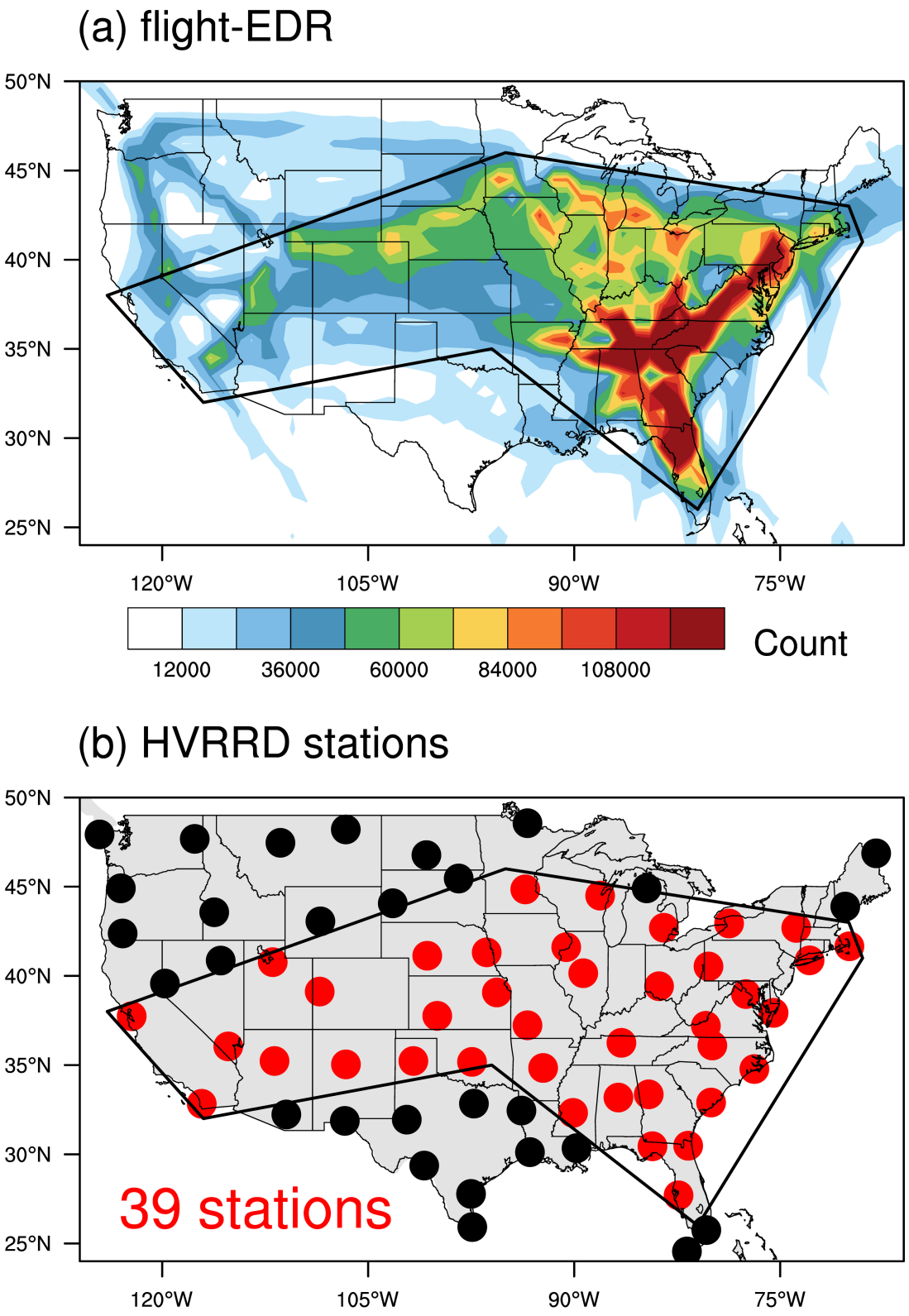

Figure S1. (a) Horizontal distributions of flight-EDR counts at z = 20–40 kft over a 10-year period (2015–2024), and (b) locations of HVRRD stations (red: inside the main flight routes, black: outside the main flight routes). In (b), the number of stations within the main flight routes is 39.

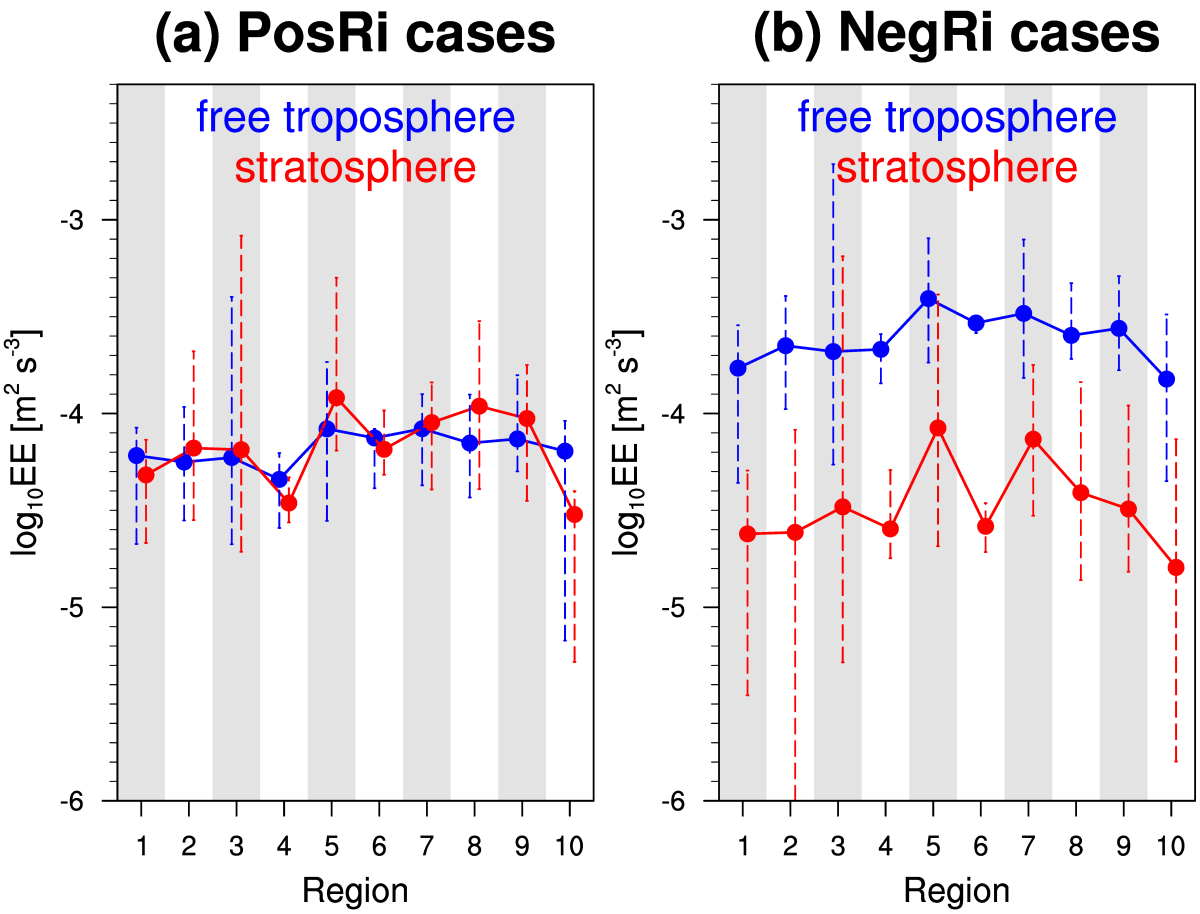

Figure S2. Median (dots) and full range (dashed lines) of $\log_{10}$EE in each region in the free troposphere (from 3 km above the station height to the tropopause; blue) and stratosphere (red), shown separately for (a) positive $\boldsymbol{Ri}$ (PosRi) and (b) negative $\boldsymbol{Ri}$ (NegRi) cases.

Table S1. Summary of variables provided in the NetCDF output files, including variable names, descriptions, and physical units. All variables follow CF metadata conventions within the NetCDF file. Variables with the suffix "NT" denote variables calculated within identified turbulence layers.

Order	Variable	Description	Unit
1	stid	Station identification	
2	dt	Temporal resolution	s
3	wlat	WMO* latitude	degrees_north
4	wlon	WMO longitude	degrees_east
5	ilat	Initial latitude	degrees_north
6	ilon	Initial longitude	degrees_east
7	lat	Latitude	degrees_north
8	lon	longitude	degrees_east
9	geo	Geopotential height	m
10	pres	Air pressure	Pa
11	temp	Air temperature	K
12	Pt	Potential temperature	K
13	Tp	Tropopause height	m
14	U	Zonal wind speed	$m\ s^{-1}$
15	V	Meridional wind speed	$m\ s^{-1}$
16	Nsq	Squared Brunt-Vaisala frequency	s^{-2}
17	vws	Vertical wind shear	s^{-1}
18	Ri	Richardson number	
19	Nsq_NT	Nsq within the turbulence layer	s^{-2}
20	vws_NT	VWS within the turbulence layer	s^{-1}
21	Ri_NT	Ri within the turbulence layer	
22	L_NT	Length scale	m
23	K_NT	Diffusivity	$m^2\ s^{-1}$
24	TKE_NT	Turbulent kinetic energy	$m^2\ s^{-2}$
25	eps_NT	Eddy dissipation rate	$m^2\ s^{-3}$
26	sat	Moist-saturation layer (0=False, 1=True)	
* WMO: World Meteorological Organization			