Supporting information of tables and Figures

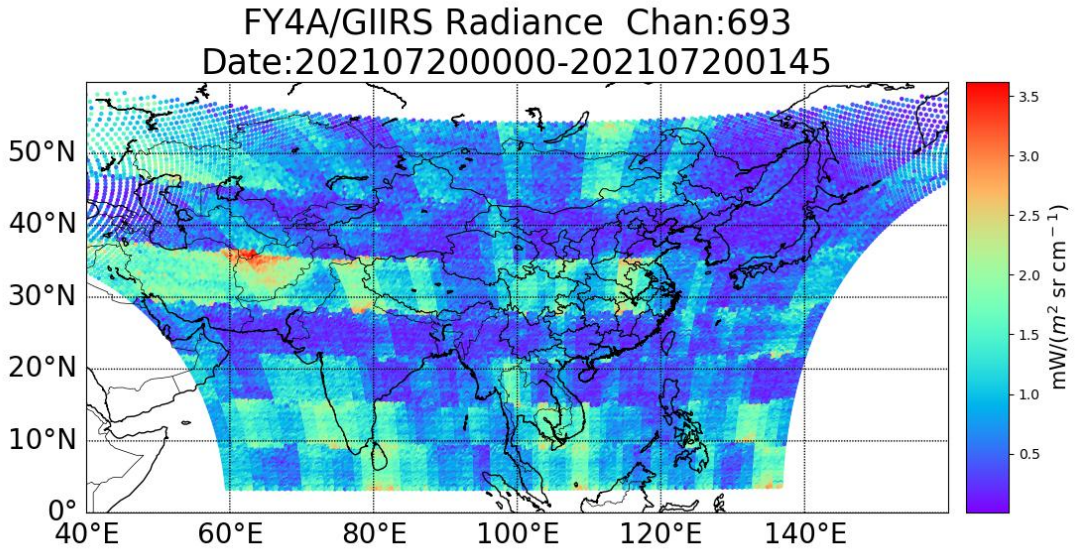


Figure S1. Spatial distributions of radiance observation for MWIR channel 693 (1651.875 cm^{-1}).

Table S1. GIIRS MWIR channel selected in this paper.

Channel Number	Wave Number (cm^{-1})	Channel Number	Wave Number (cm^{-1})	Channel Number	Wave Number (cm^{-1})	Channel Number	Wave Number (cm^{-1})	Channel Number	Wave Number (cm^{-1})
960	1818.75	982	1832.5	1046	1872.5	1059	1880.625	1091	1900.625
961	1819.375	991	1838.125	1047	1873.125	1060	1881.25	1104	1908.75
962	1820	995	1840.625	1048	1873.75	1061	1881.875	1136	1928.75
963	1820.625	996	1841.25	1049	1874.375	1075	1890.625	1138	1930
965	1821.875	1014	1852.5	1050	1875	1076	1891.25	1168	1948.75
966	1822.5	1018	1855	1051	1875.625	1081	1894.375	1170	1950
967	1823.125	1019	1855.625	1052	1876.25	1087	1898.125	1175	1953.125
972	1826.25	1022	1857.5	1054	1877.5	1088	1898.75	1202	1970
973	1826.875	1030	1862.5	1055	1878.125	1089	1899.375	1264	2008.75
974	1827.5	1045	1871.875	1056	1878.75	1090	1900		

Table S2. The data assimilated in CTRL and GIIRS experiments.

Data assimilated		CTRL	GIIRS
Conventional observations	AIREP	✓	✓
	TEMP	✓	✓
	SHIP	✓	✓
	SYNOP	✓	✓
Radar observations	VAD	✓	✓
Satellite observations	GPSPW	✓	✓
	GPSREF	✓	✓
	SATOB	✓	✓
	GIIRS MW		✓

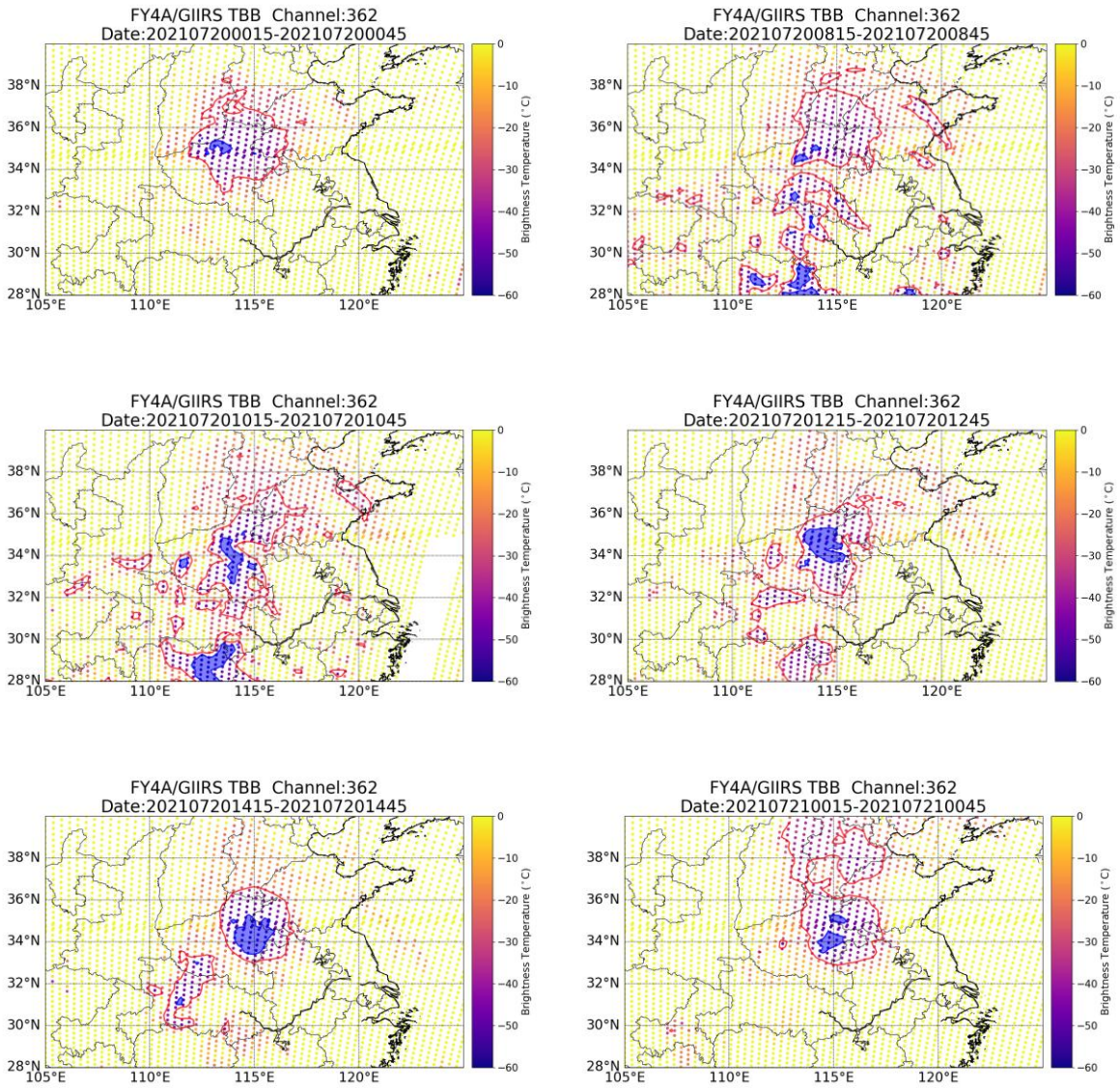


Figure S2. Spatial distributions of brightness temperature observation for LWIR window channel 362 (926.25 cm^{-1}) on 20 July 2021.

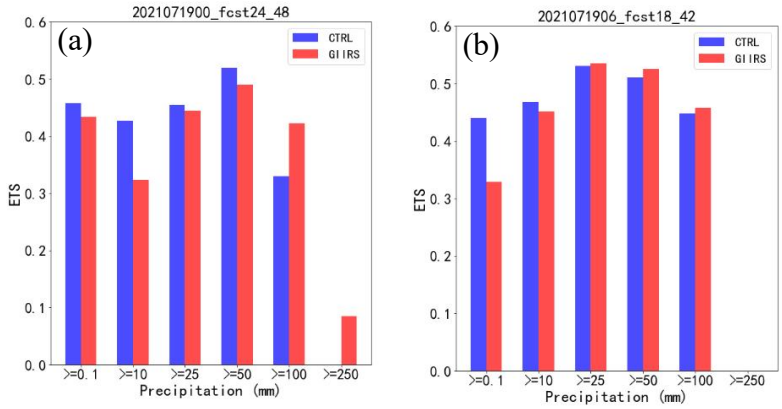


Figure S3. The ETS scores of predicted 24-h accumulated precipitation during 0000 UTC 20 July 2021 to 0000 UTC 21 July 2021 of CTL experiment (blue bar) and GIIRS experiment (red bar) from cold-start at 0000 UTC 19 July 2021 (a) and warm-start at 0600 UTC 19 July 2021 (a).

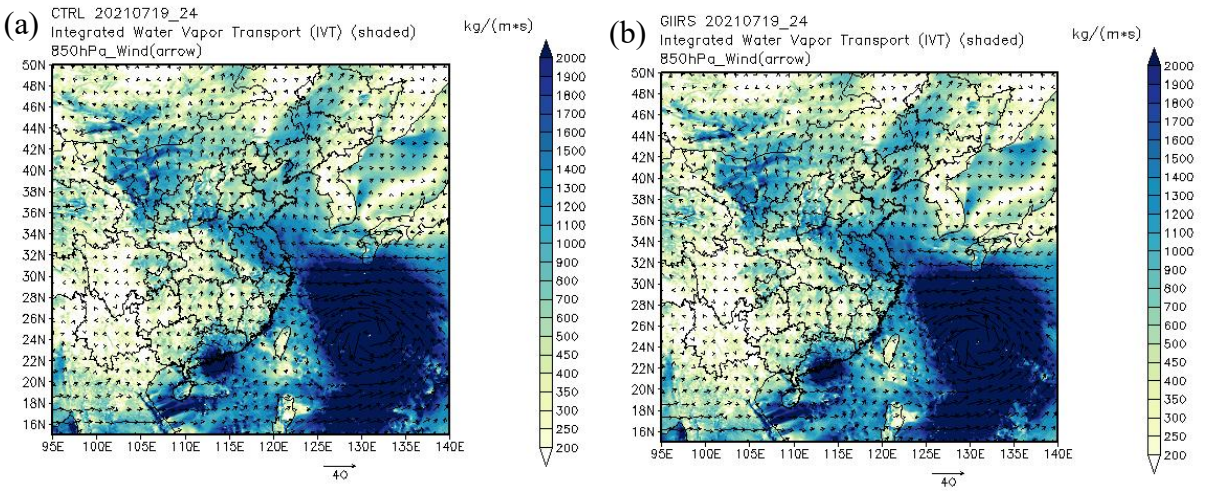


Figure S4. The integrated water vapor transport (kg m^{-1} s^{-1}) of CTL (a) experiment and GIIRS (b) experiment at 0000 UTC on 20 July, 2021 (24-hour forecast from 0000 UTC, 19 July, 2021).