A Multi-Model Investigation of Asian Summer Monsoon UTLS Transport over the Western Pacific

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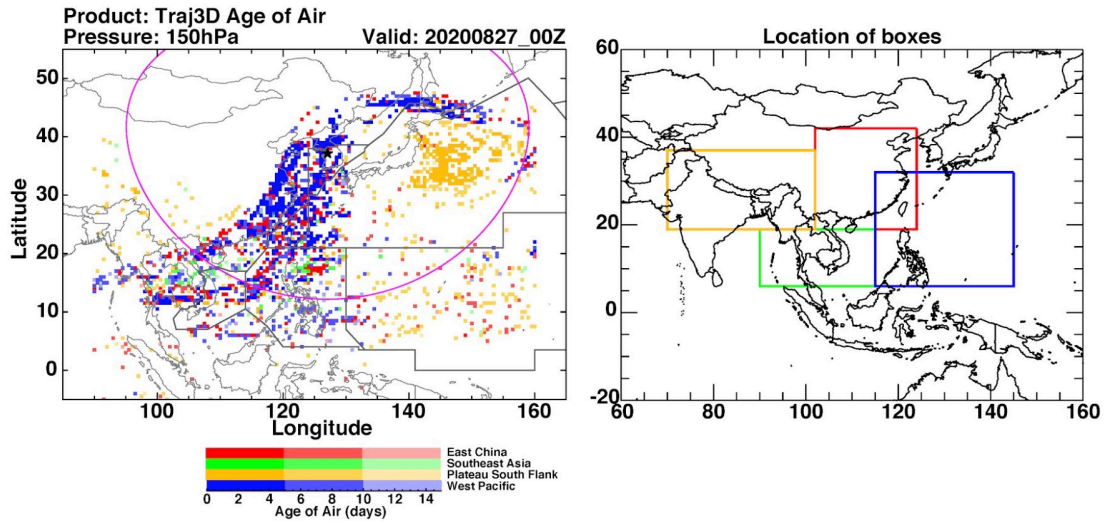
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Figure S1. Example of RDF (reverse domain filling) forecast product (left) and the locations of four designated boundary layer region for identifying transport origins (right). The map indicates the RDF forecast domain. The colored pixels on the map indicate the region of transport origin, diagnosed as where the back-trajectory intercepts the top of the boundary layer within 15 days. The four regions, marked by the colored boxes in the "locator map" at the lower left below the map and also shown as the enlarged on the right, are defined as East China (red), Southeast Asia (green), Plateau South Flank (orange), and West Pacific (blue). Note that the overlapping region between the red and blue boxes are counted as East China.
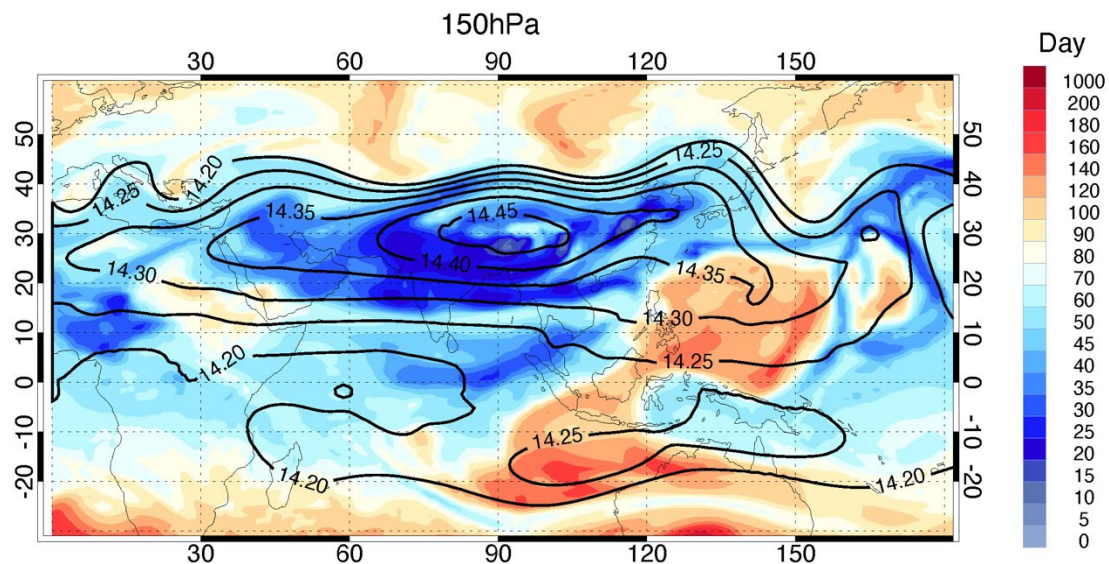

Figure S2. An example of CO lifetime distribution at the 150 hPa pressure levels calculated from WACCM model. The example is for 4 August 2017. Selected 150

hPa geopotential height (GPH) contours are overlaid to indicate the upper tropospheric flow pattern and the anticyclone location.
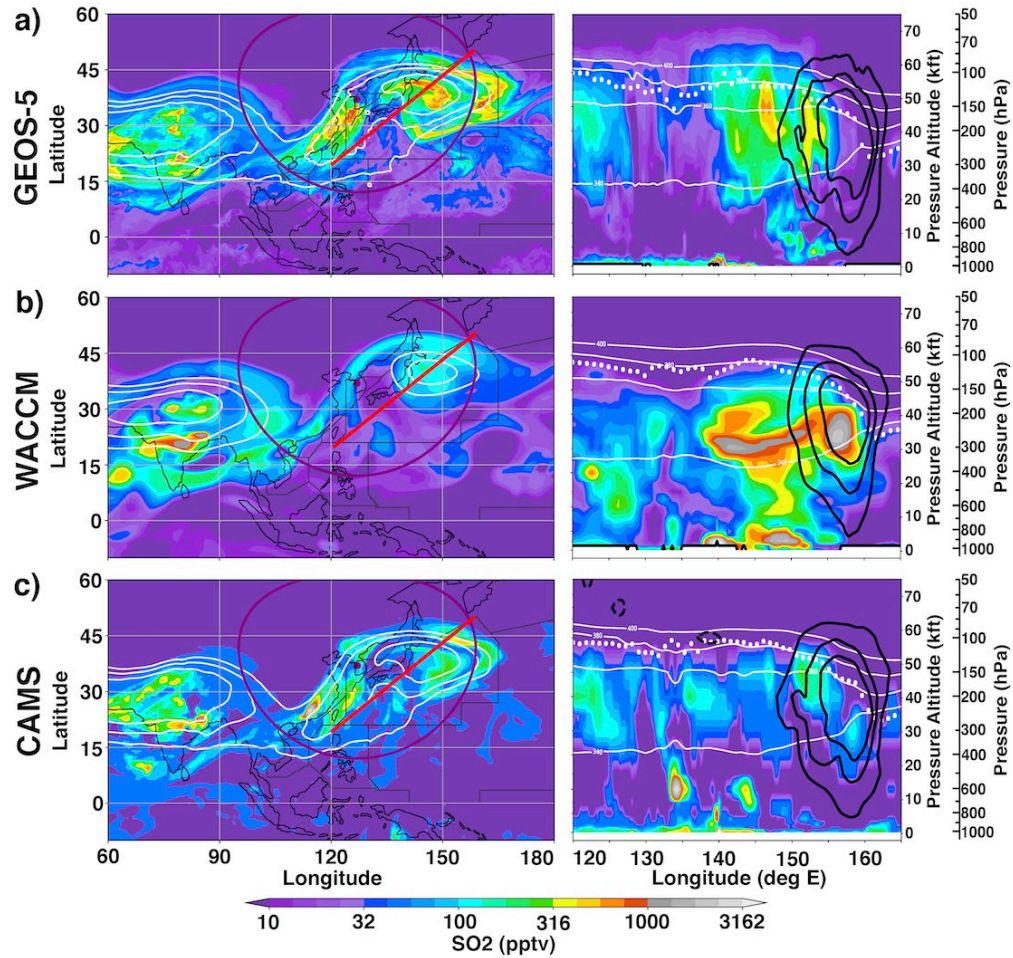

Figure S3. SO₂ at 150 hPa and a SWNE cross-section ([10°S, 88°E] to [60°N, 168°E], marked by the red line on the map) for the three chemistry models. Selected GPH contours overlaid on the maps indicate the structure of the anticyclone. Dynamical fields overlaid on cross sections are selected isentropes (white line), tropopause (white dots), and zonal wind (black contours) indicating the westerly jet.