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## Balloon-borne in situ profiles of aerosol, water vapor, and ozone within the Asian summer monsoon anticyclone during the ACCLIP 2022

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Balloon soundings within the Asian summer monsoon anticyclone (ASMA) were conducted from Osan, South Korea as part of the Asian Summer Monsoon Chemical and Climate Impact Project (ACCLIP) in August of 2022. Over 30 soundings in 12 days were accomplished with high resolution co-located *in situ* profiles of aerosol size distributions, water vapor, ozone, and state parameters from the surface to the lower stratosphere. Aerosol measurements included accumulation mode particle size and number concentrations with Printed Optical Particle Spectrometers (POPS), coarse mode measurements with LASP Optical Particle Counters (LOPC), and total aerosol between 20 nm and 10  $\mu\text{m}$  with Stratospheric Total Aerosol Counters (STAC). The aerosol sondes observed a pervasive Asian Tropopause Aerosol Layer (ATAL) and temperature dependent microphysical trends that are consistent with the location of the cold-point tropopause and lapse rate minimum. Simultaneous flights with cryogenic frostpoint hygrometers (EN-SCI CFH) and ozonesondes (EN-SCI ECC) provided context on the UTLS mixing processes in the ASMA through tracer-tracer relationships. Model reanalysis products suggest that the soundings were within the ASMA domain and back trajectories indicate sampling of fresh and aged air masses within the UTLS transported from the ASMA circulation. These measurements add to the limited record of aerosol and water vapor observations of the Asian UTLS during the summer monsoon and provide an understanding of the ATAL that can only be gathered from continuous vertical profiles.