



Aircraft observations of trace gases and aerosols in the Asian summer monsoon anticyclone

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In-situ measurements of trace gases and aerosols in the Asian summer monsoon anticyclone are presented from the ESMVal and OMO field campaigns with the HALO research aircraft. Sharp gradients in chemical tracer mixing ratios are observed at the boundary of the anticyclone. In particular, SO_2 , reactive nitrogen, and aerosols are enhanced inside the anticyclone. SO_2 and aerosols are tightly correlated indicating sulfate aerosol formation in the SO_2 -rich air masses. Ozone and carbon monoxide are enhanced or reduced in the anticyclone depending on the degree of in-mixing of stratospheric air inferred from observations of the stratospheric tracer HCl. Backward trajectory analysis, tracer dispersion calculations, and simulations with the chemistry-climate model EMAC are used to investigate the origin and transport of trace gases in and in the vicinity of the anticyclone.