

The Asian SUMmer MOnsoon (SUMO): Survey of (one of) the most polluted region in the UTLS

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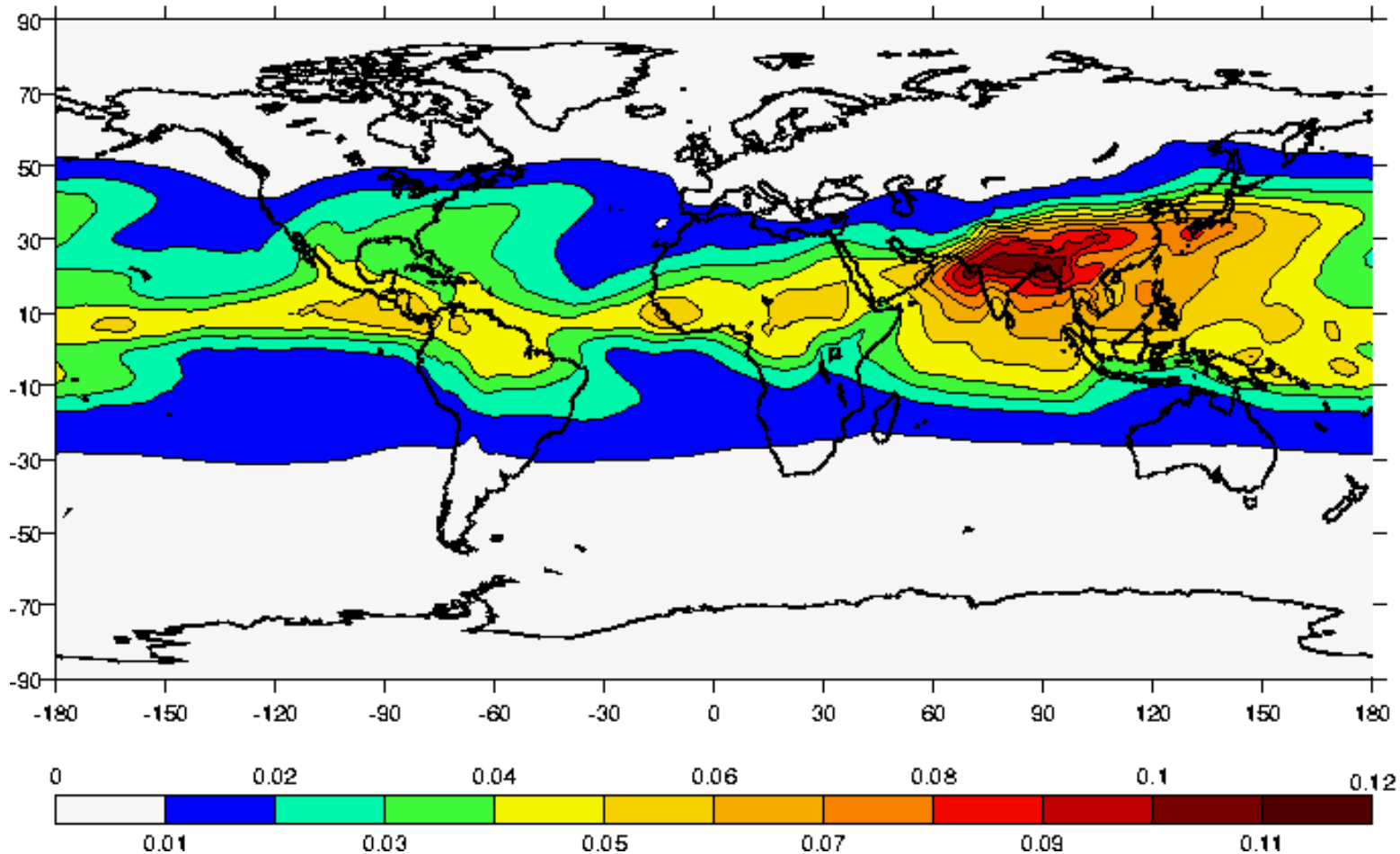
Background

Source of pollutants: southern Asia, home of ~3 billion humans, emits large and strongly growing amounts of pollutants

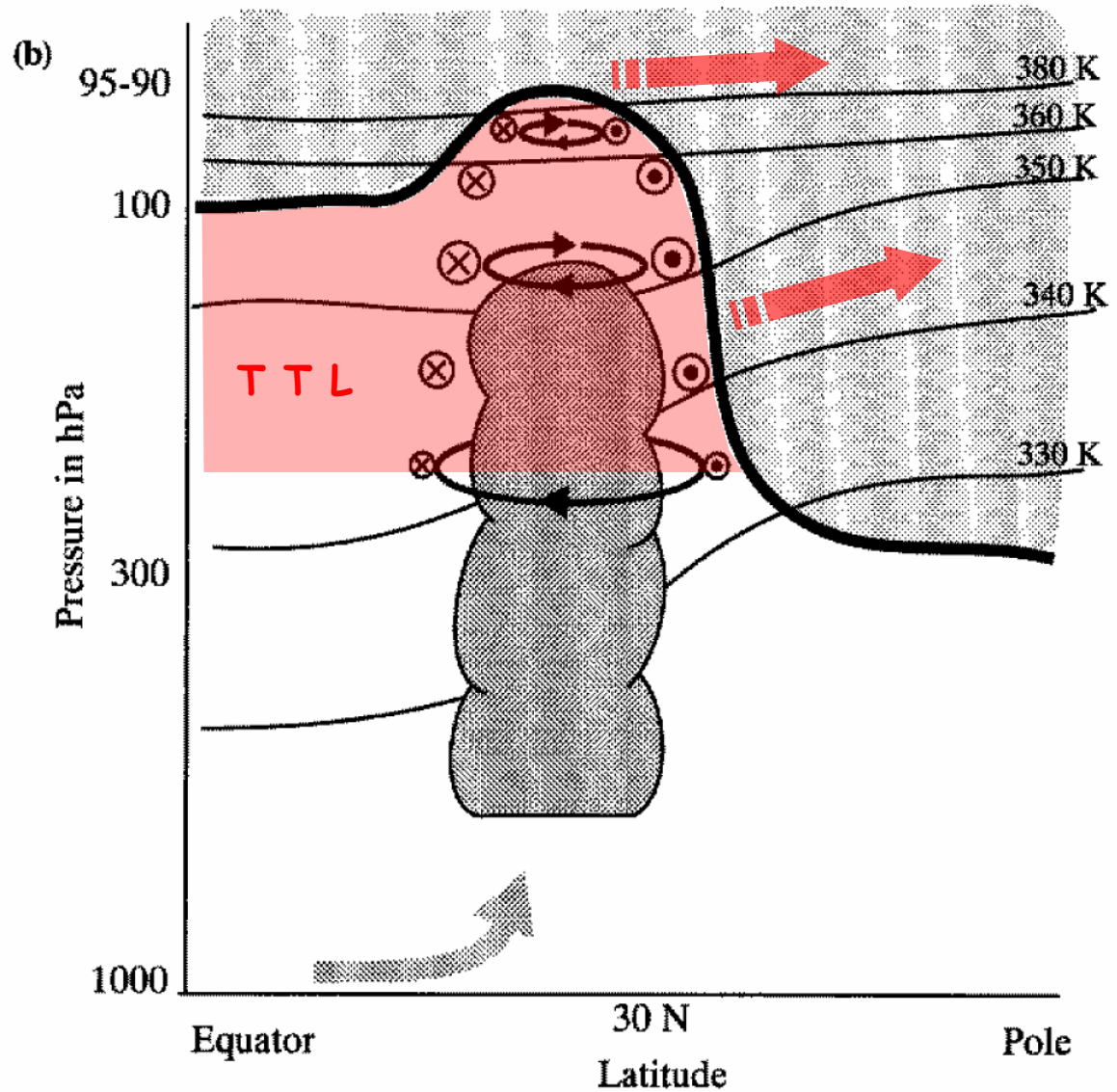
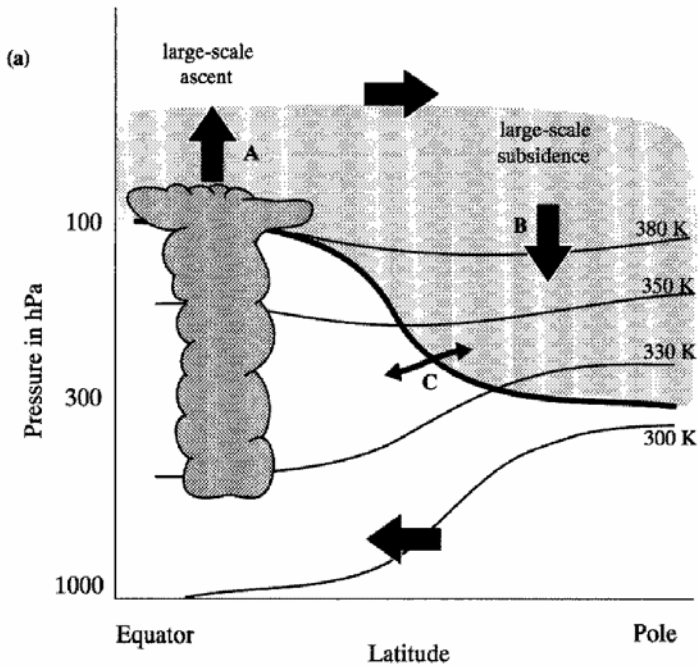
	population (10^9)	economic growth 2004 (%)
China	1.28	9.0
India	1.05	6.4
Pakistan	0.15	6.4
Bangladesh	0.14	5.5
Indonesia	0.21	4.8

Lofting mechanism: Asian monsoon in summer

ECMWF 15-year (1979-93) mean specific humidity in July at 200 hPa (in g/kg), i.e. in 12-13 km altitude (in the tropics)



TTL over summer India



- to characterize the species (trace gas and aerosol) composition and chemical fate of the Asian pollution plume
- to study its export i) vertically into the TTL and ii) quasi-horizontally northwards into the lowermost stratosphere (LMS), southwards into the southern hemisphere, and westwards towards the Mediterranean Sea (Europe)
- to assess the potentially considerable impact on the trace gas budget of the TTL on a regional as well as global scale (note that almost 1/2 of the World's population live in the relevant area)
- to provide models with improved emission inventories for this very important source area
- support to FreeTOx, proposal by J. Lelieveld
- support to SPOTT, proposal by U. Schumann

Logistic:

- o 2-3 weeks in July/August with base e.g. Delhi
- o 5-6 measurement flights plus 2 transfer flights
- o Maybe complemented using the Geophysica M-55

Payload (in situ and remote sensing):

- o Greenhouse gases / tracers $H_2O, CO_2, CO, CH_4, N_2O, SF_6$
- o Chemistry / pollutants $O_3, NO, NO_2, NO_y, CH_2O, PAN$
 OH, HO_2, RO_2
VOCs , halocarbons (GC, samples)
- o Isotopologues H_2O, CO, CO_2, CH_4
- o Aerosol concentration, size distribution, compos.

Campaign should be repeated (each) ~5 years