

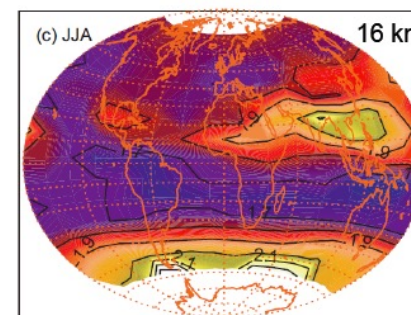
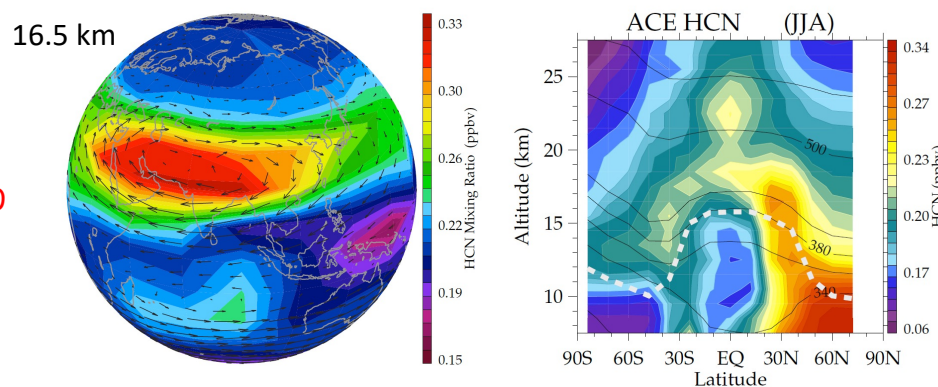
An Overview of the Asian Summer Monsoon Chemical and Climate Impact Project (ACCLIP)

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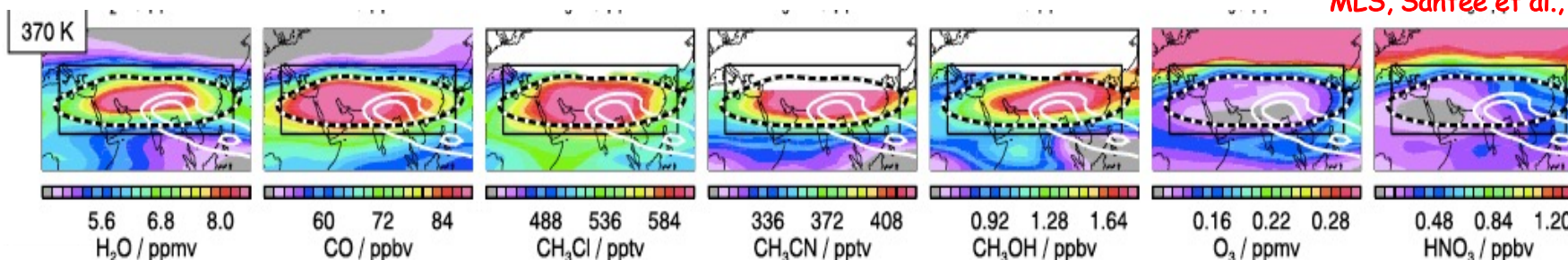
ACE-FTS HCN

Randel et al. 2010



SAGE II:
1020 nm aerosol
extinction coefficient
ratio

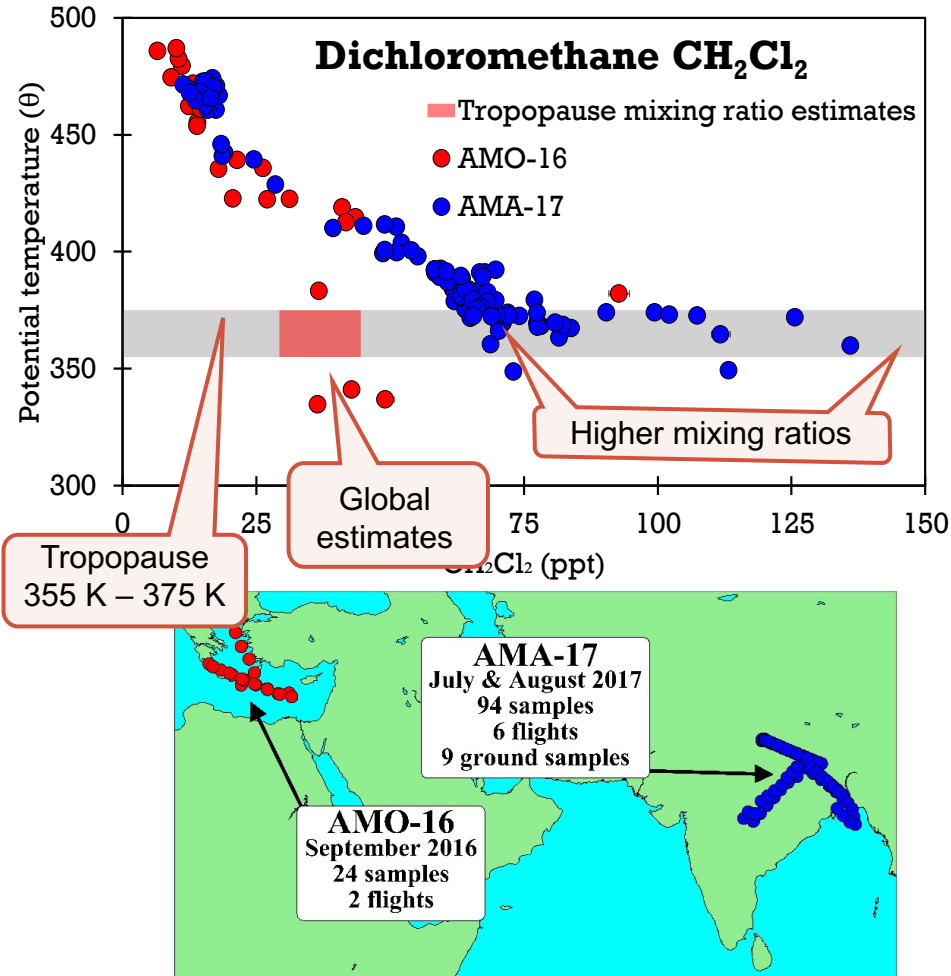
Thomason and Vernier, 2013



MLS, Santee et al., 2017

Important Role of Airborne Observations

StratoClim Campaign 2017 (Geophysica)



Adcock et al., 2021 JGR

Observations with the airborne instrument GLORIA
(Gimballed Limb Observer for Radiance Imaging of the Atmosphere)

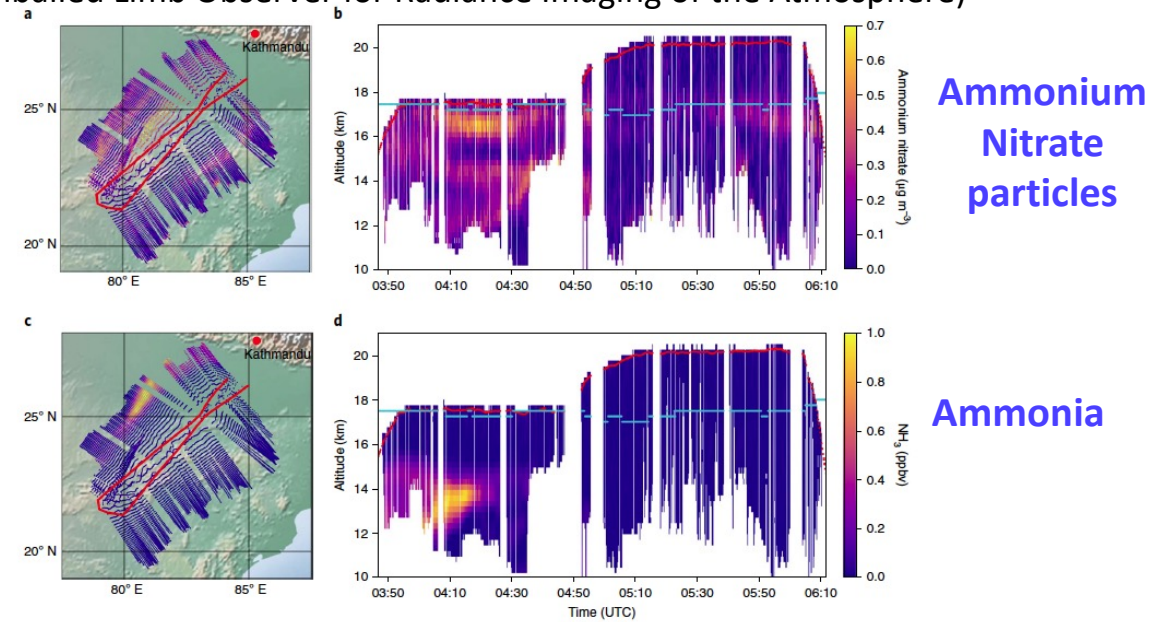
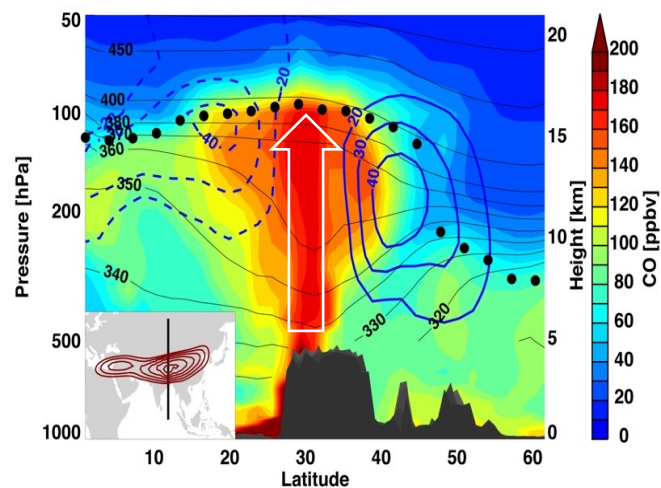


Fig. 3 | Airborne limb-imaging observations of AN and NH_3 in the UT above India during the 2017 Asian monsoon season. **a-d**, Altitude-time horizontal projections of AN mass densities (**a,b**) and NH_3 VMRs (**c,d**), derived from GLORIA measurements during the Geophysica flight on 31 July 2017. The horizontal projections at the tangent points are given in **a** and **c** and the vertical projections in **b** and **d**. The vertical resolution and estimated uncertainty (precision, accuracy) are: AN, 0.8 km, $\pm 0.03 \mu\text{g m}^{-3} \pm 30\%$; NH_3 , 0.8 km, $\pm 8 \text{ pptv} \pm 20\%$. Red lines, aircraft position (**a** and **c**) and altitude (**b** and **d**); light blue lines, lapse rate tropopause (**b** and **d**). UTC, coordinated universal time.

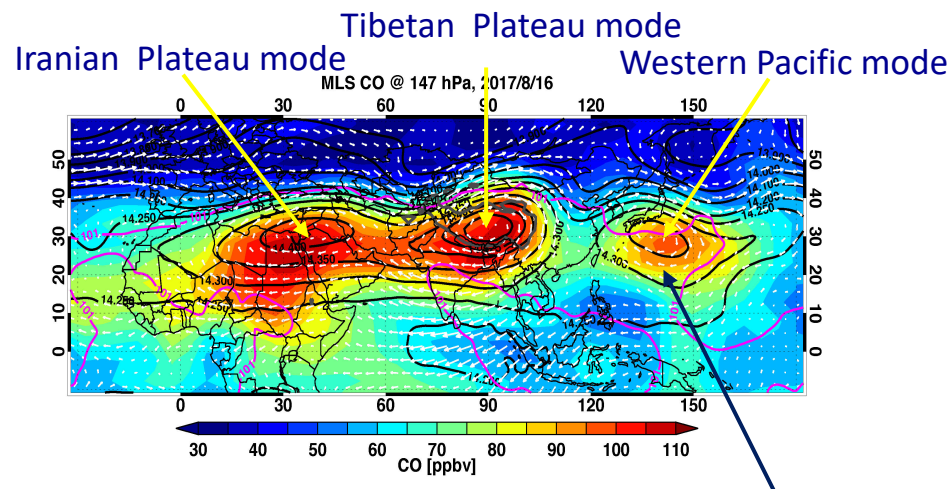
Höpfner et al., 2019

Asian Monsoon UTLS Dynamics and Transport

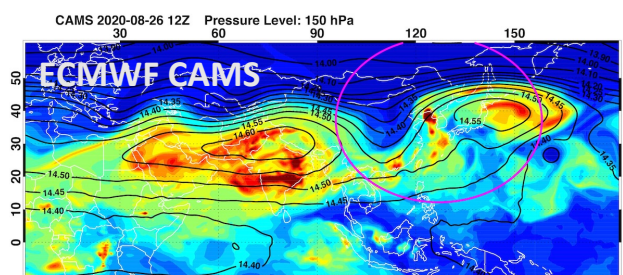
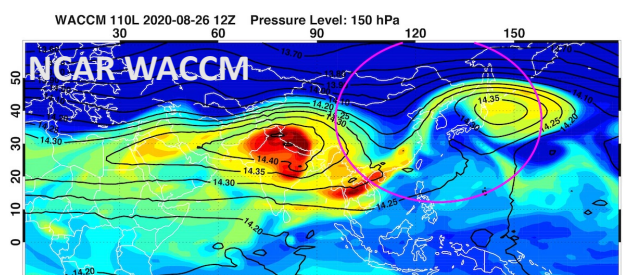
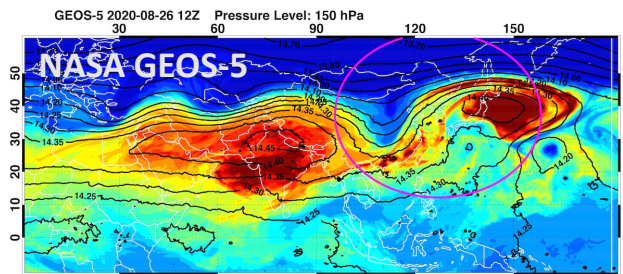
CO from NCAR WACCM model



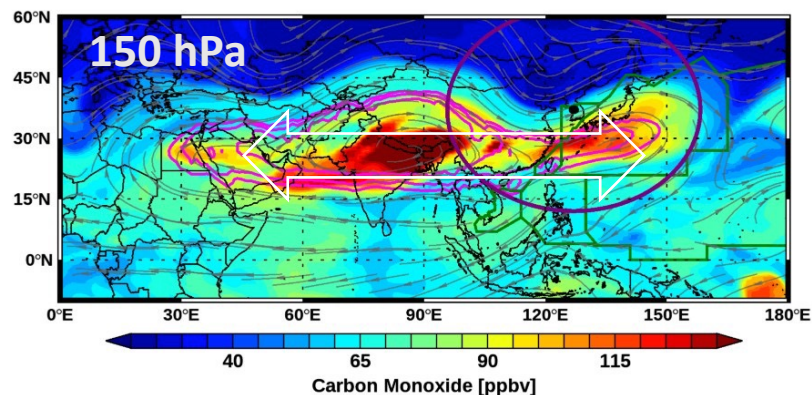
MLS CO example



CO 150 hPa multi-model forecast



Southern edge of the Tibetan Plateau:
Primary region of uplifting



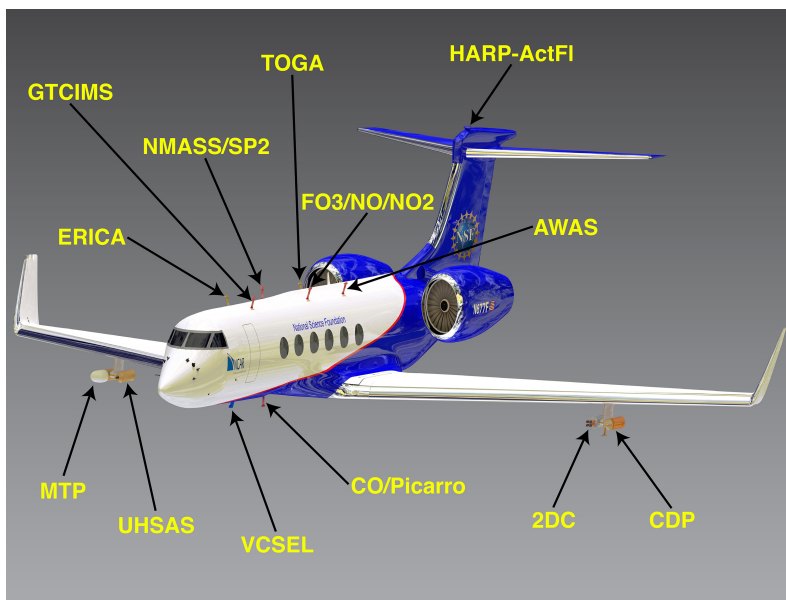
The Western Pacific Anticyclone and
eastward "eddy shedding"

The Asian summer monsoon Chemical and Climate Impact Project (ACCLIP):

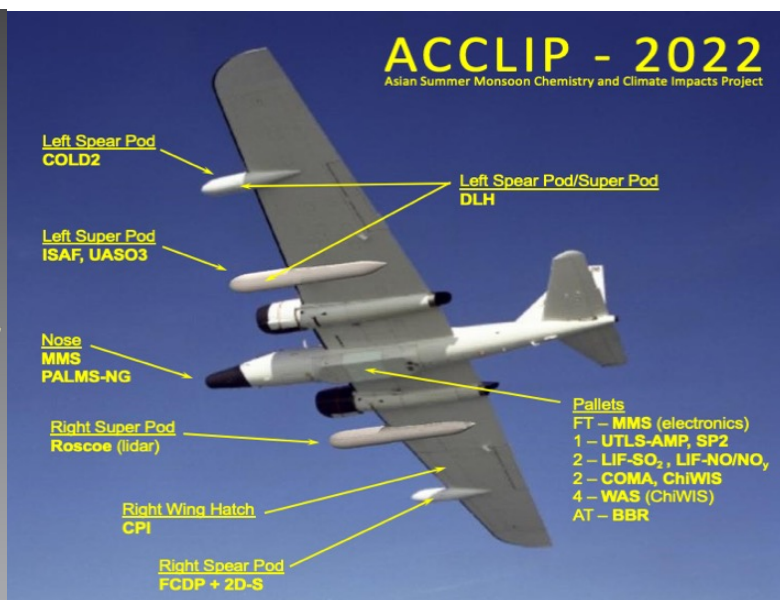


Principal Investigators: Laura Pan (NCAR), Paul Newman (NASA)

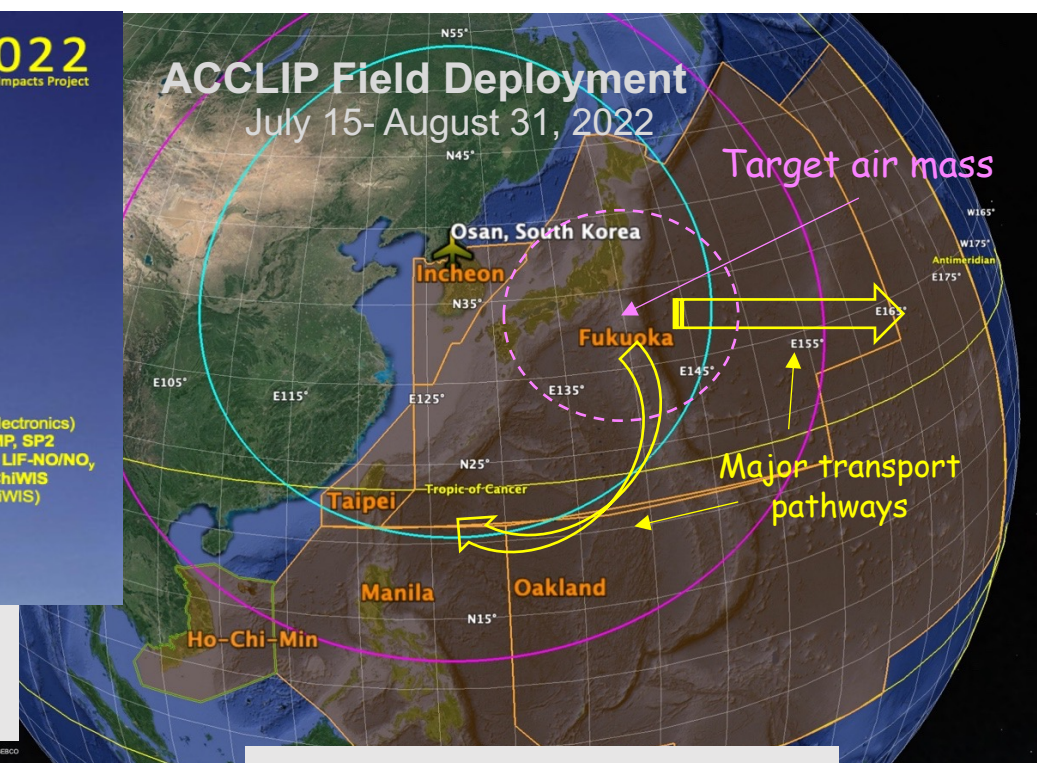
Lead Co-Investigators: Elliot Atlas (Univ. Miami), William Randel (NCAR), Troy Thornberry (NOAA), Brian Toon (CU)



NSF/NCAR Gulfstream V (GV)
Duration: ~ 8 hr flight
1000 ft (0.3 km) and FL 470 (14.7 km)



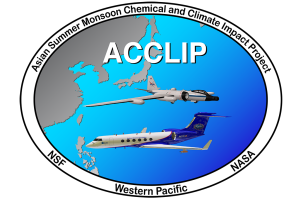
NASA WB-57
Duration: ~ 6 hr
FL 430 (13 km) and FL 620 (19 km)



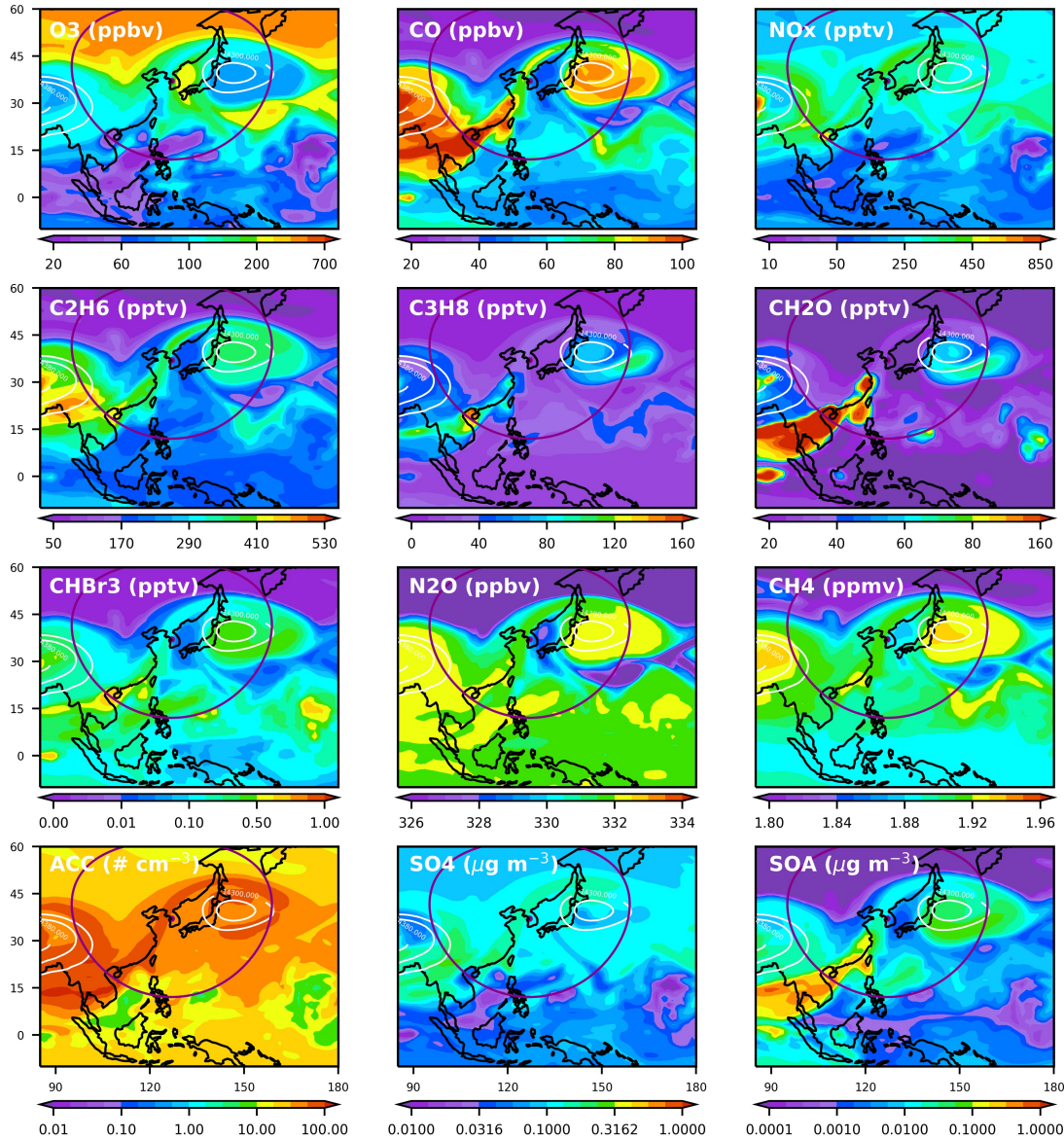
Osan US Air Force Base
Republic of Korea

For ACCLIP GV and WB-57 data product information:

ACCLIP 2020 Season Modeling Dry Run Highlights



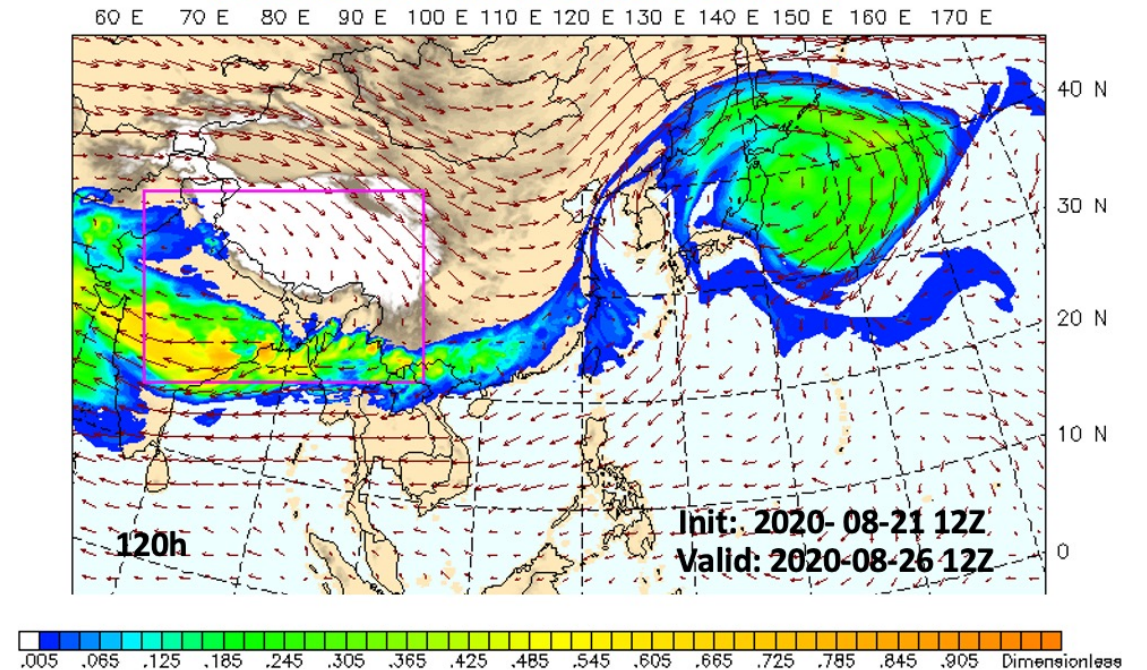
WACCM 150hPa



- Rich chemical content in Asian Monsoon UT outflow over the Western Pacific
- South Asia is the dominant BL source region

WRF Surface Tracer at 14 km

(magenta box marks the region of emission)





NASA WB-57 Instruments Integration and Test Flights

Jul-Aug 2021, Ellington Field , TX



Greg Schill

Photo Credit

Laura Pan