

Comparison of MLS with SOWER observations

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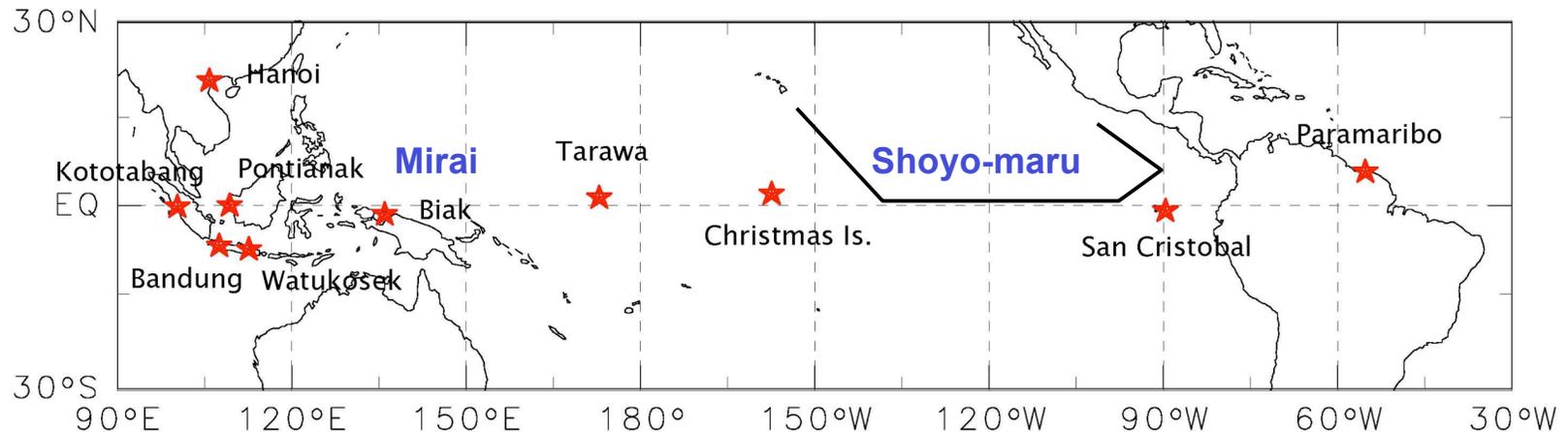
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SOWER/Pacific

Soundings of Ozone and Water in the Equatorial Region/Pacific
Mission (SOWER/Pacific)



- Filling the gap of data sparse area such as in the equatorial Pacific
- Understanding the climatology and variability (STE: Stratosphere-Troposphere Exchange; TTL: Tropical Tropopause Layer)
- Balloon-borne ozone and water vapor observations in collaboration with NOAA/CMDL
- Tropospheric chemistry, Satellite validation ...

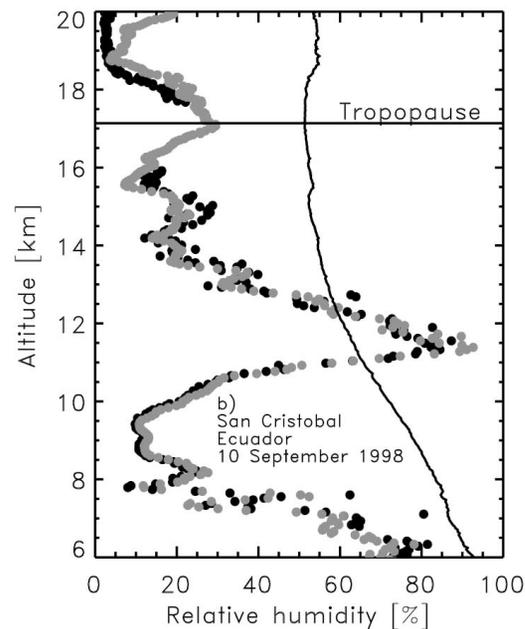
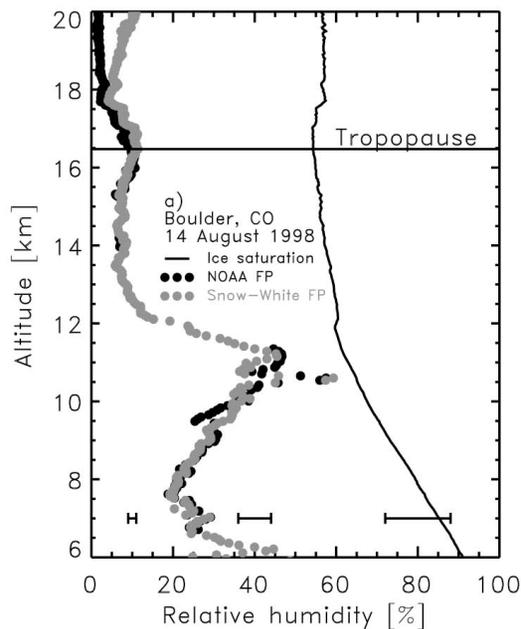
SOWER observation tools

Water vapor:

- i) **Snow White**: Swiss-made commercial chilled-mirror hygrometer
- ii) **CU-CFH**: chilled-mirror hygrometer developed at NOAA

Ozone:

Electrochemical concentration cell (ECC) ozonesonde

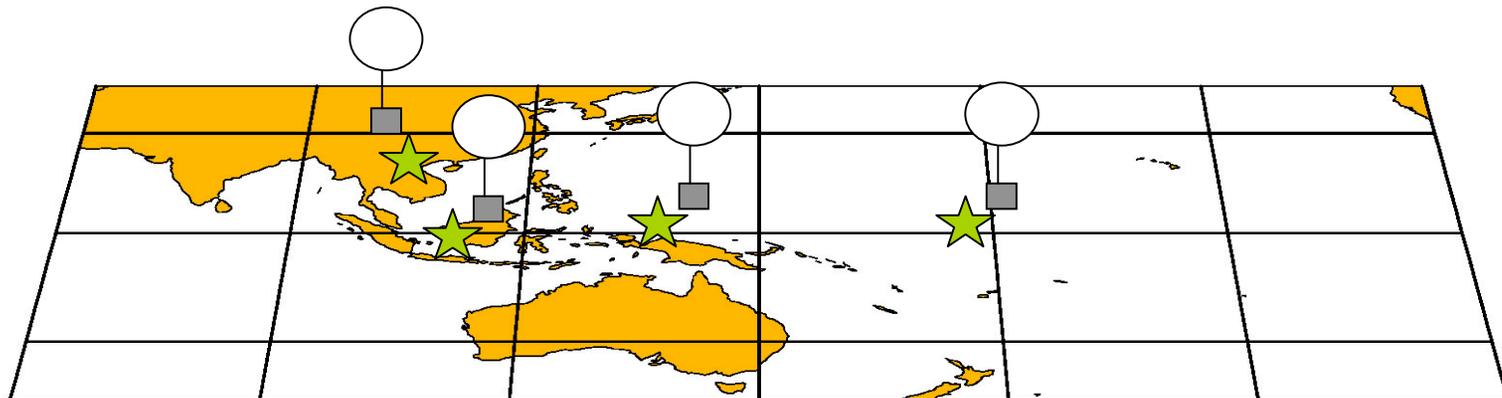
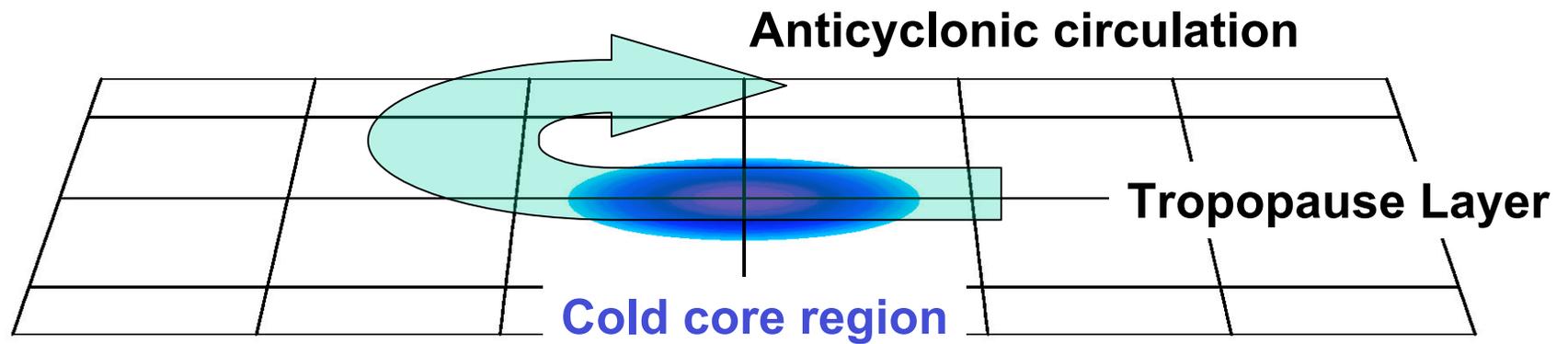


(Fujiwara et al., JTECH, 2003; Voemel et al., JTECH, 2003.)

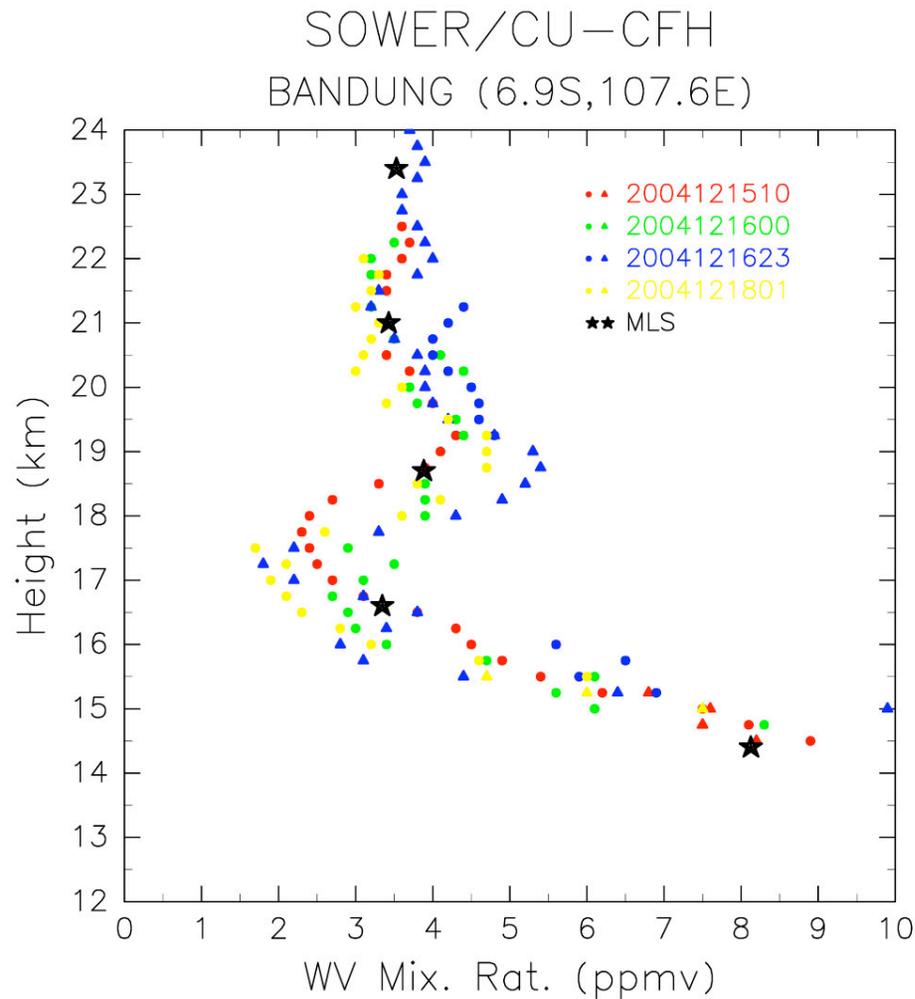
SOWER Campaign in 2004 winter

- Tarawa - PTU, Ozone, Snow White (20 launches)
 - Biak - PTU, Ozone, Snow White (3 launches)
 - Bandung – PTU, Ozone, CU-CFH (4 launches)
 - Mirai - PTU + Wind, Ozone, Snow White (15 launches)
 - Hanoi - PTU, Ozone, Snow White (8 launches)
- Performing comprehensive observation campaign to examine the dehydration process in the tropical tropopause layer (TTL) in the western and central Pacific
- A trial for a trajectory based “match” method which has been used for the estimation of ozone destruction in the polar winter

Water vapor “match”



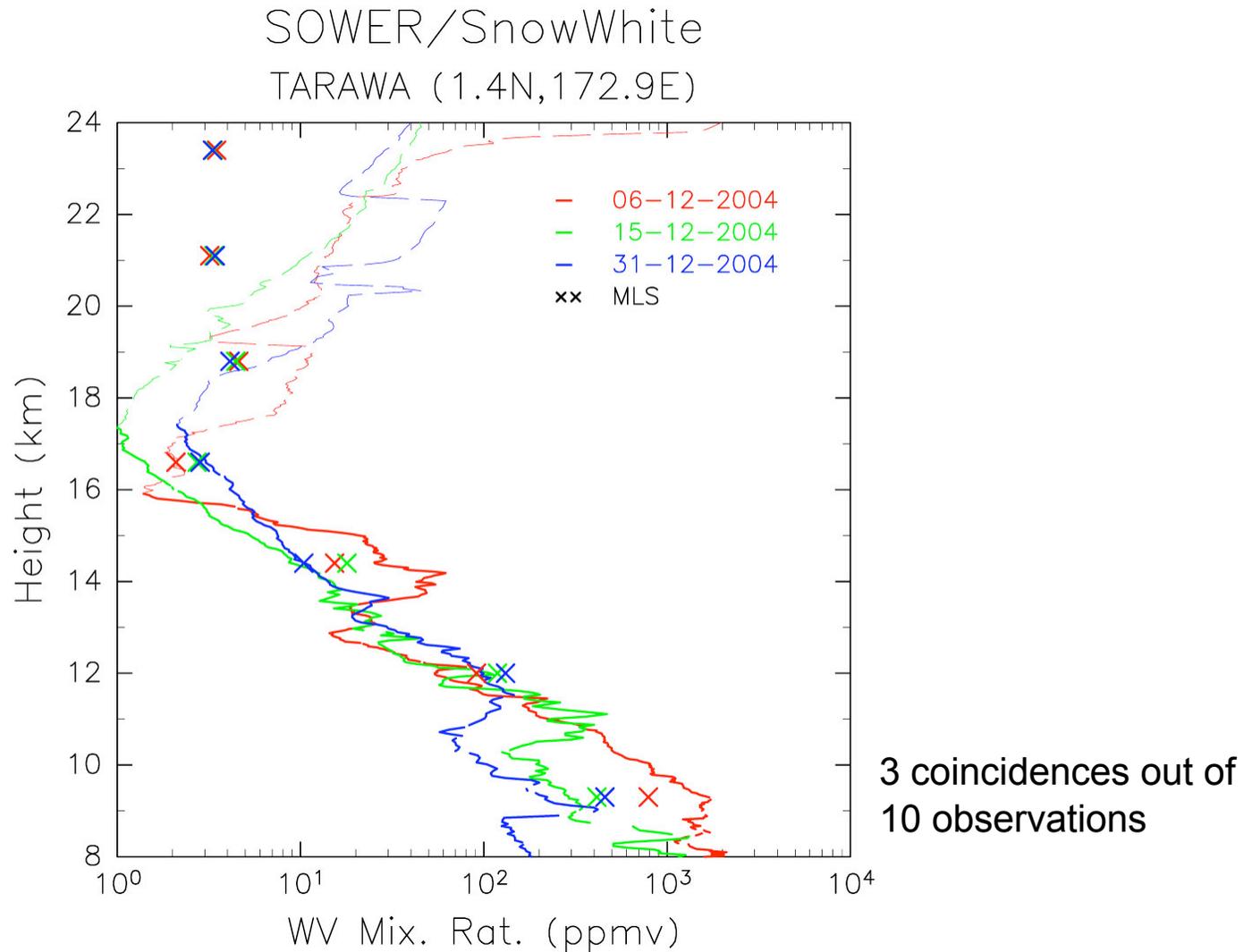
Comparison with CU-CFH



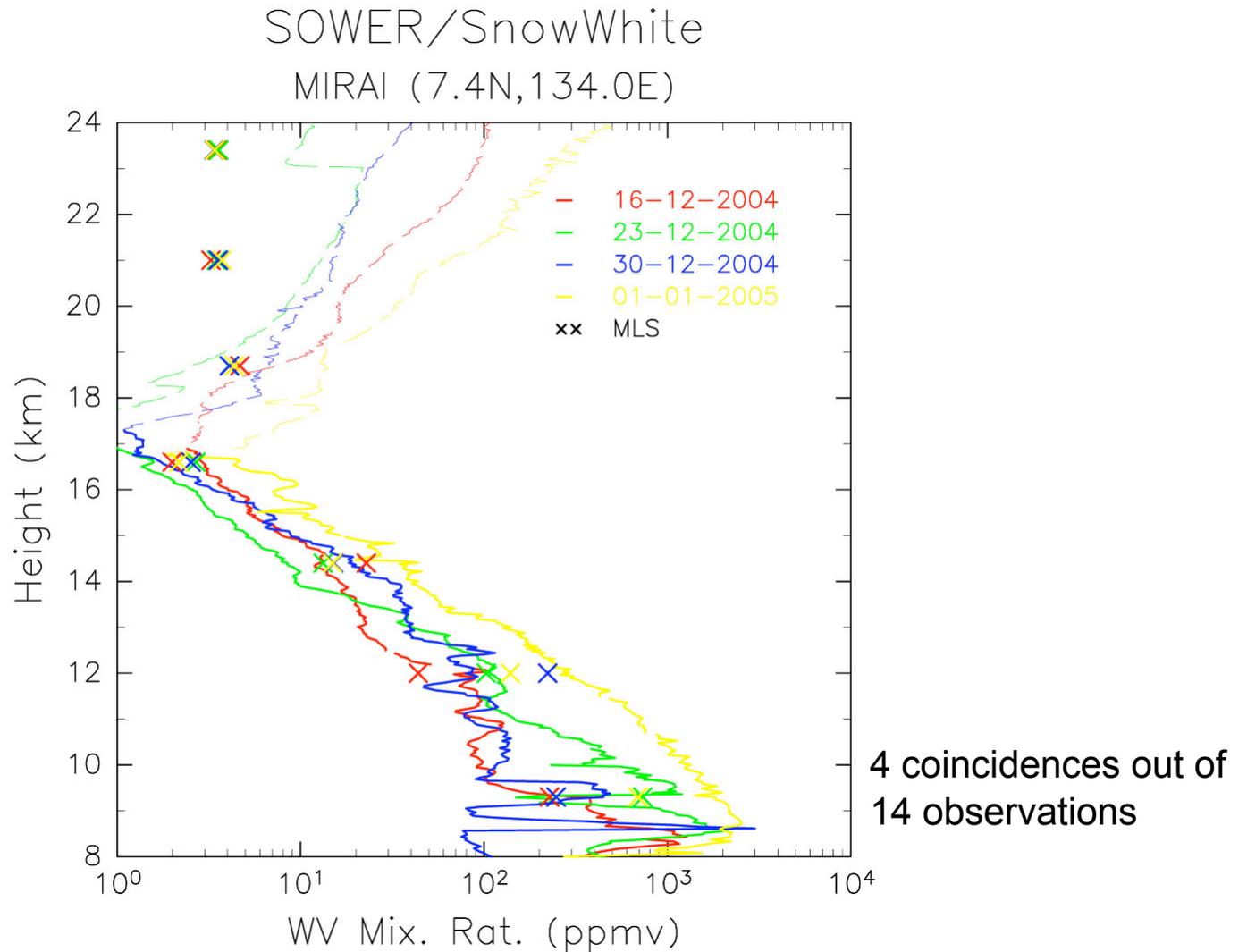
Coincidence is defined as ± 3 deg & ± 14 hours (data processed by A. Gettelman)

1 coincidence out of 4 observations

Comparison at Tarawa (SW)

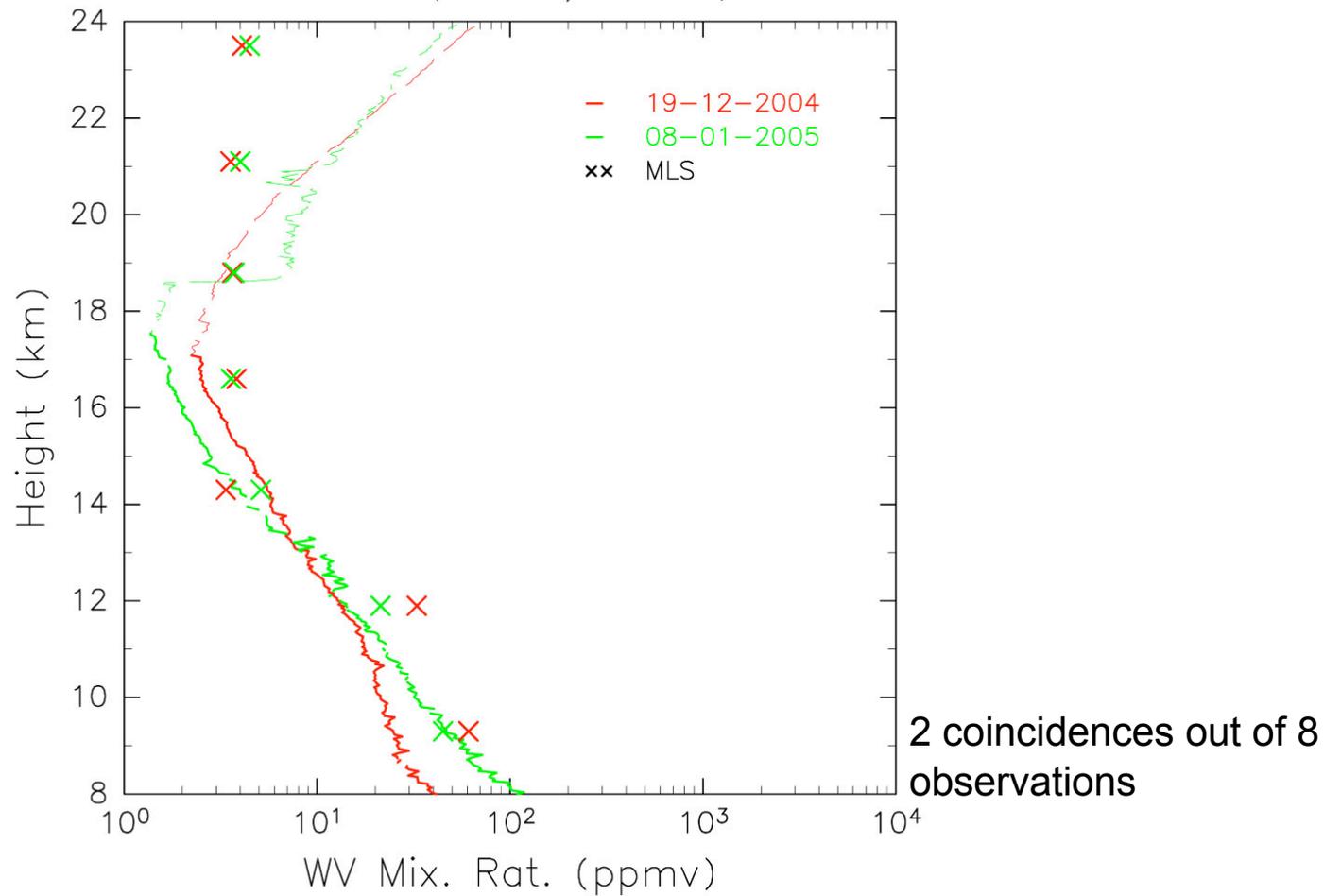


Comparison at Mirai (SW)



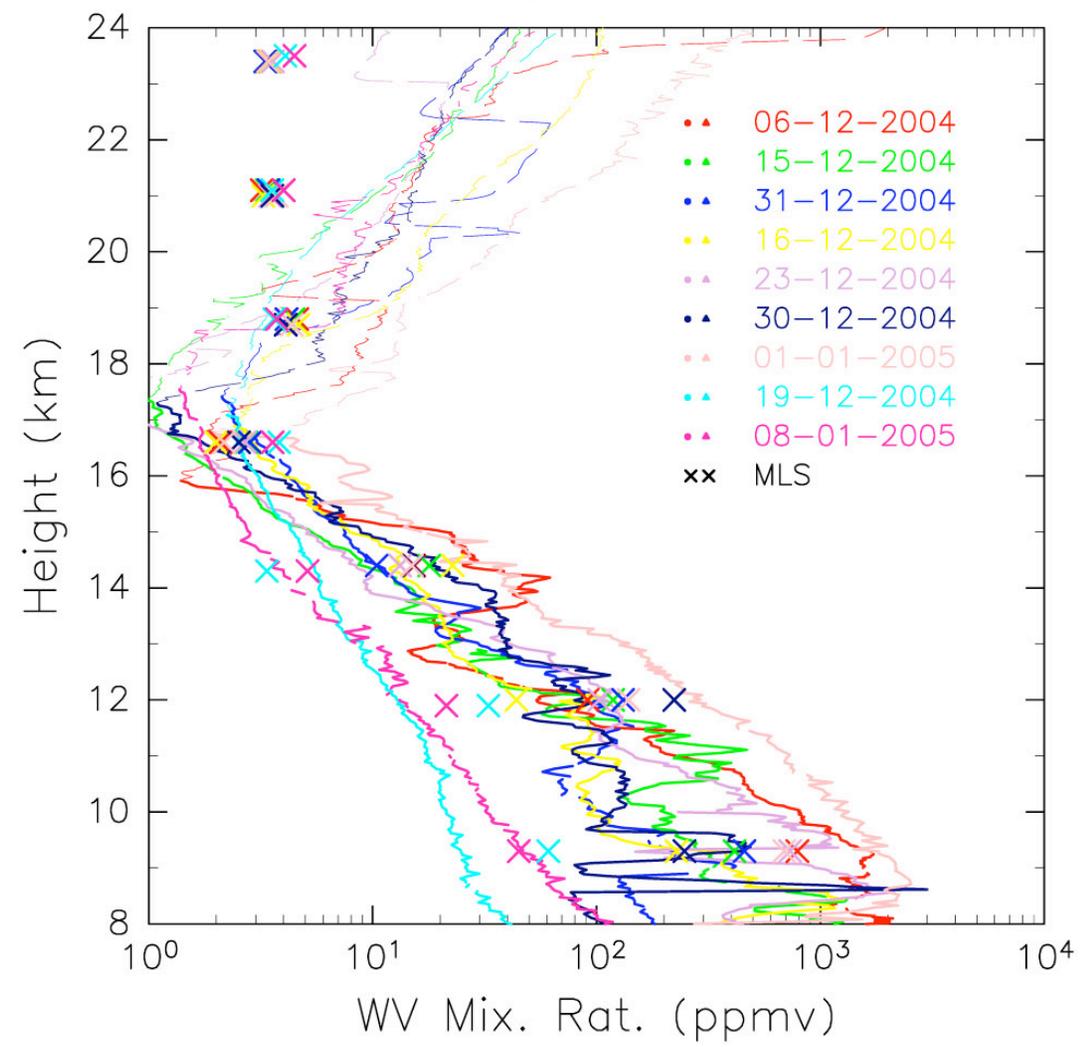
Comparison at Hanoi

SOWER/SnowWhite
HANOI (21.0N,105.8E)

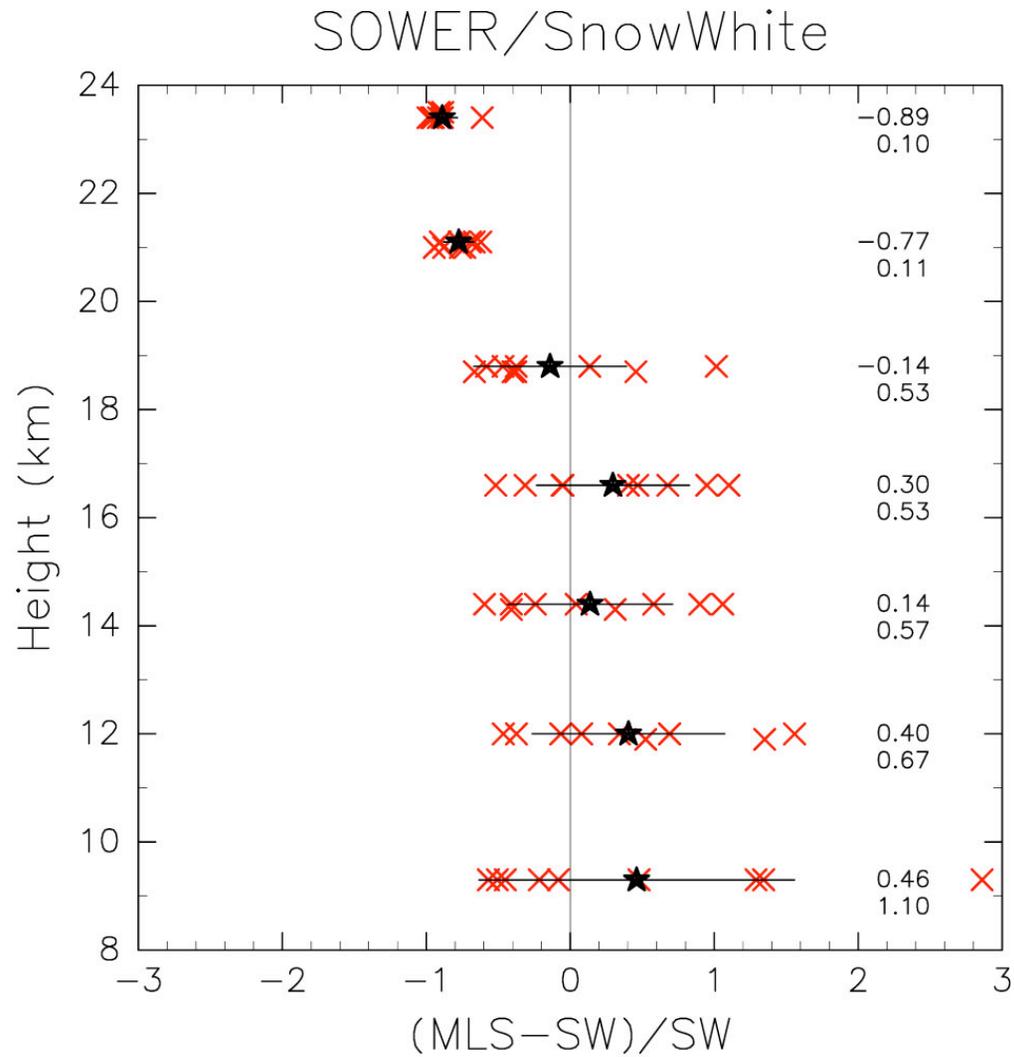


All Snow Whites

SOWER/SnowWhite



Statistical Summary

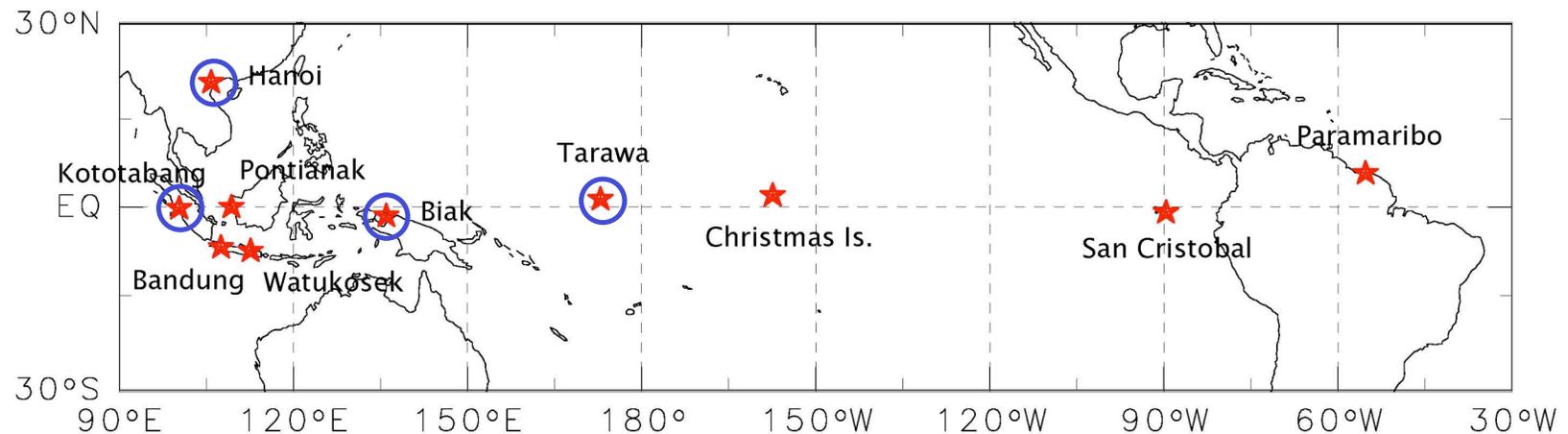


Summary

- We have performed balloon-born ozone and water vapor observations around the tropical tropopause layer in the central and eastern Pacific region.
- Results from the comparisons:
 - CU-CFH: MLS follows reasonably in the upper troposphere and in the lower stratosphere.
 - Snow White: MLS follows wet (Tarawa, Mirai) and dry (Hanoi) conditions in the upper troposphere reasonably, but has about 15 (147 hPa) - 45 (316hPa) % wet bias.

Outline of the next campaign

We plan to conduct a campaign observation in Dec. 2005 to Jan. 2006.



- Tarawa:** ozonesonde + Snow White + CU-CFH + lidar
- Biak:** ozonesonde + Snow White + CU-CFH + lidar
- Kototabang:** ozonesonde + Snow White + lidar
- Ha Noi:** ozonesonde + Snow White