



Quadiennial Ozone Symposium Edinburgh Scotland Sept 2016

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La Reunion Island (21°S, 55°) SHADOZ/NDACC station

First reprocessed ozonesonde data and comparisons with lidar measurements at the Maïdo Observatory

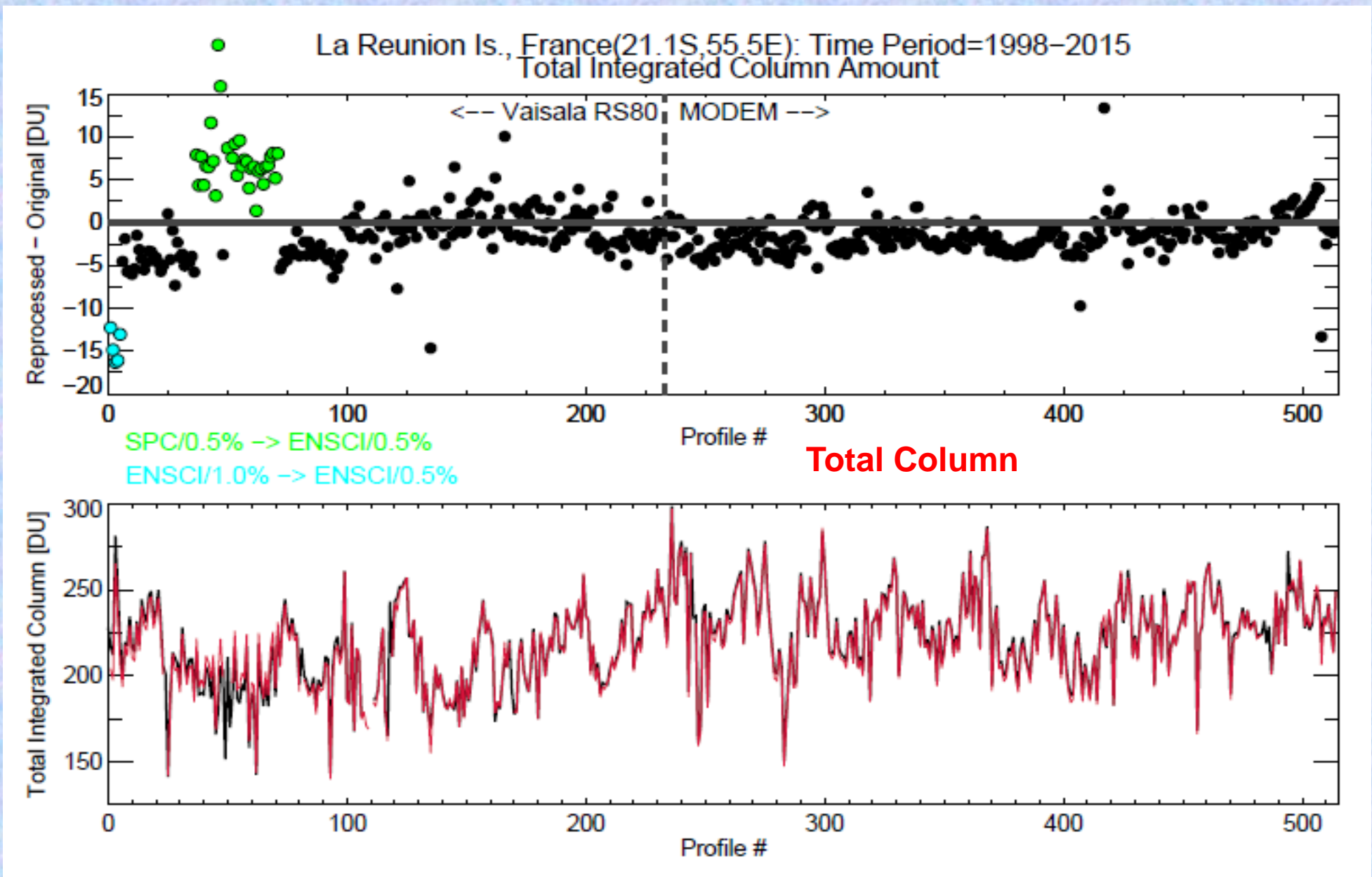
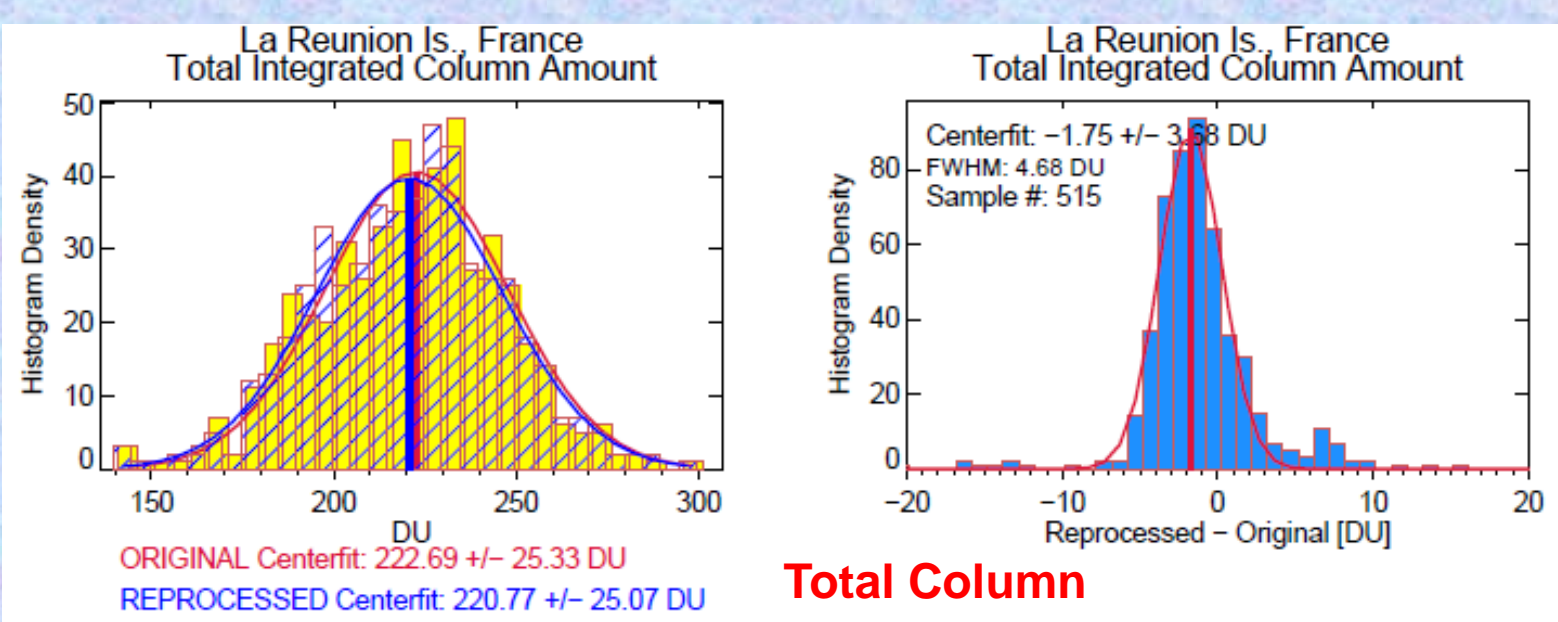
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First reprocessed Ozone data (1998-2015)

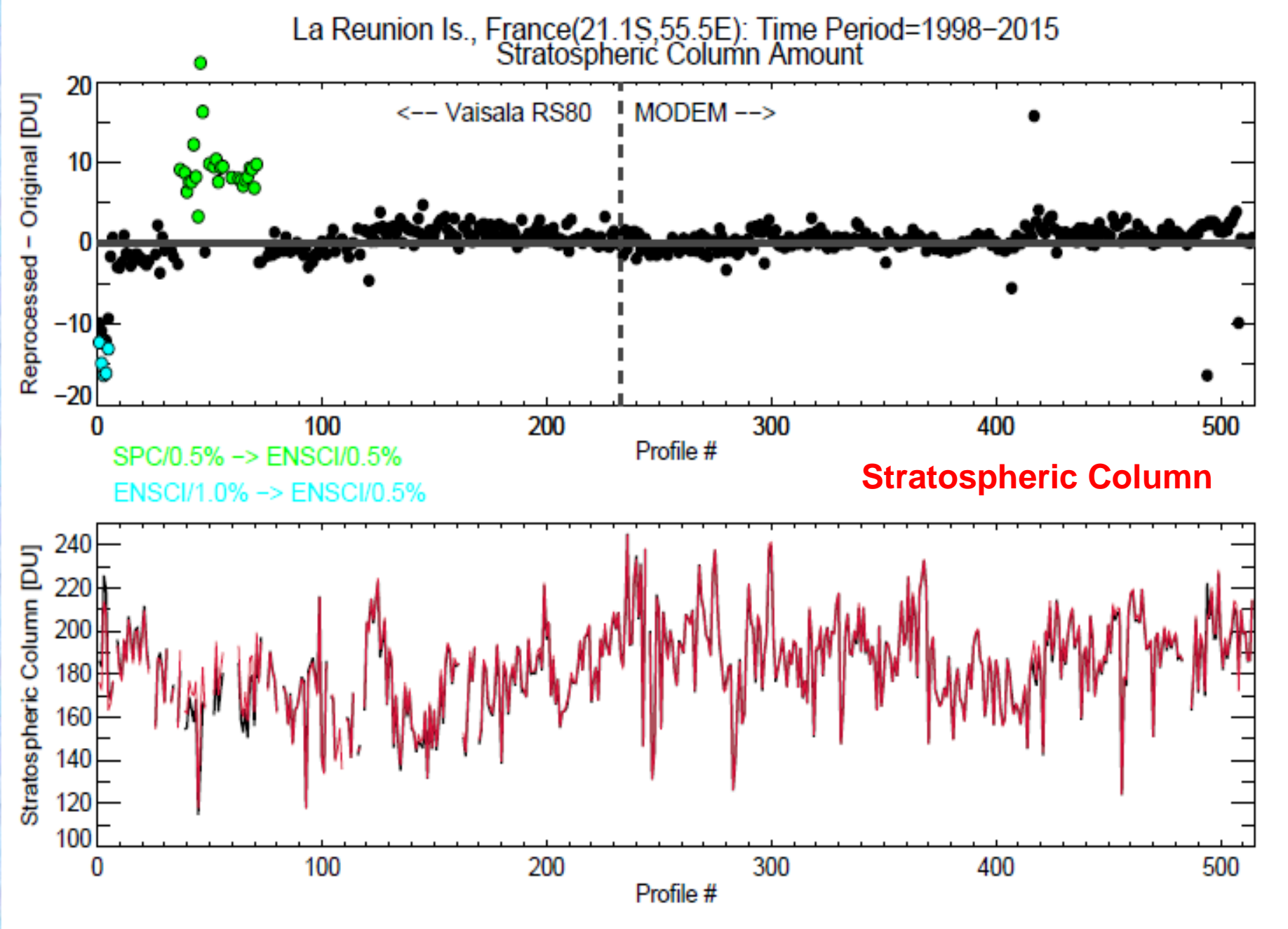
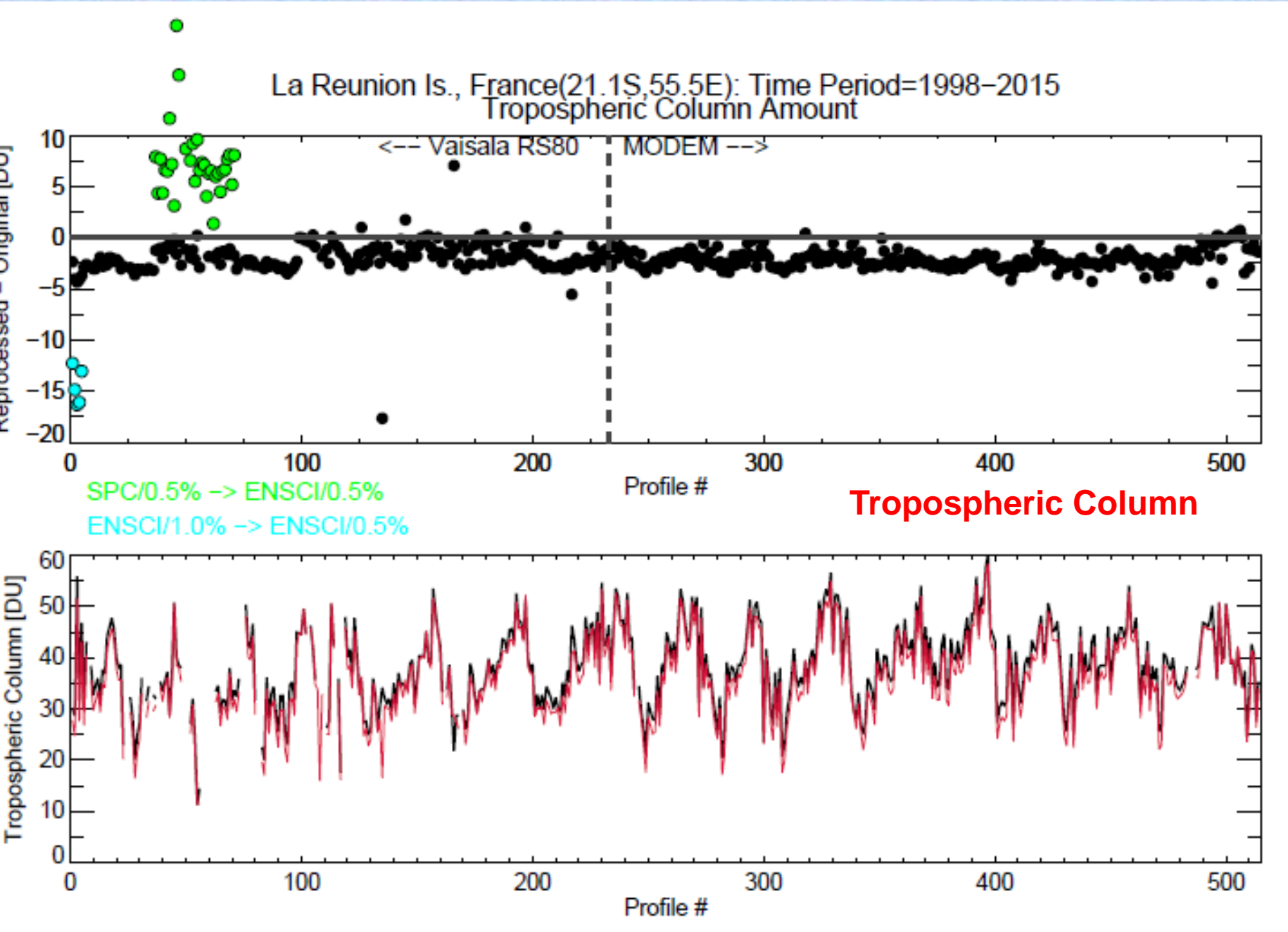
SHADOZ Sites, URL=http://croc.gsfc.nasa.gov/shadoz



!! Preliminary results !!



NDACC-SHADOZ station : 20.9°S 55.5° 8 masl (Gillot airport)



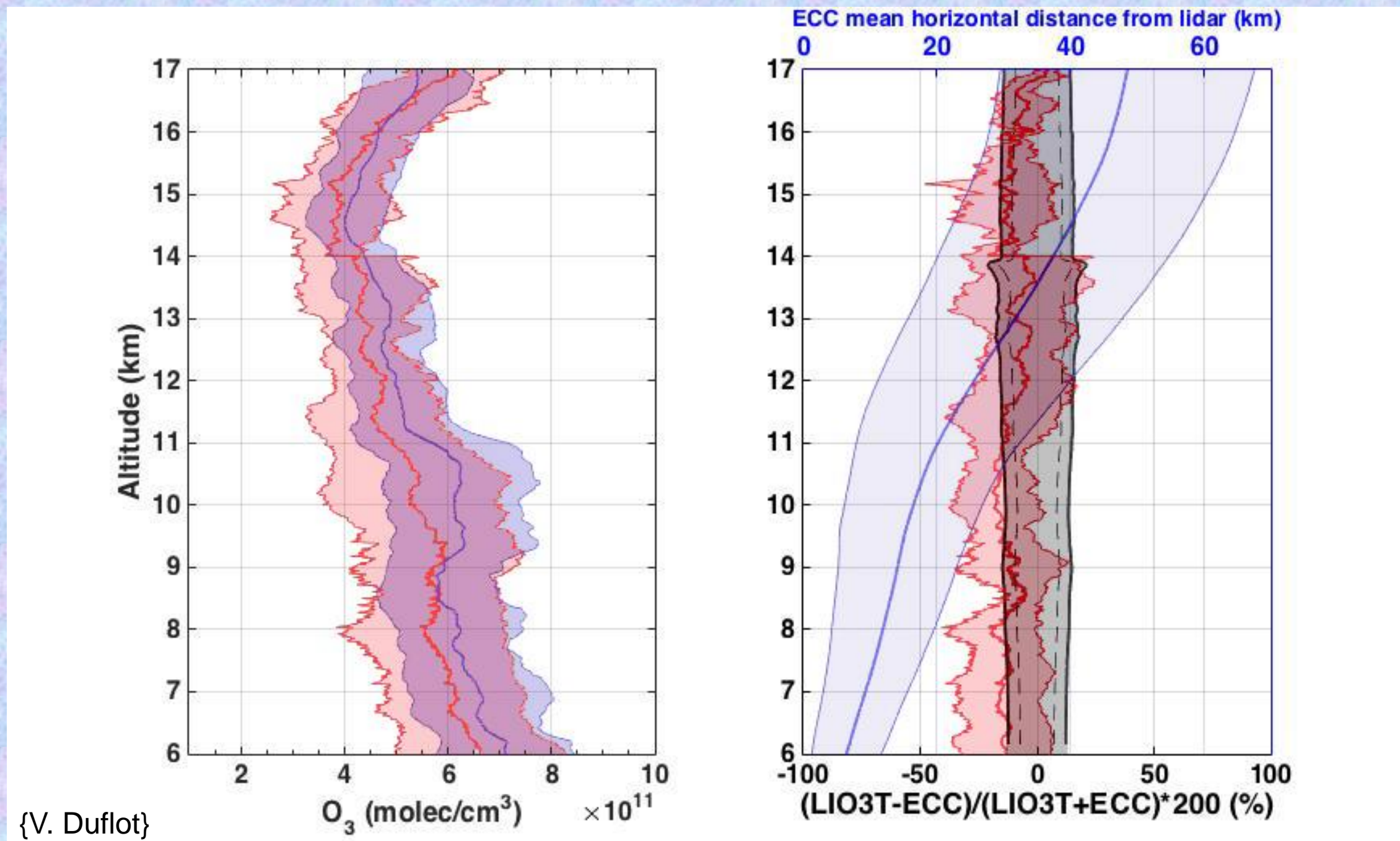
| Applied Corrections | | | |
|----------------------------------|--|----------------------|--|
| La Reunion, France (1998 – 2015) | | | |
| Solution | Type | Timeline | Correction (J. Witte) |
| | 1% Full Buffer with ENSCI | First 8 records 1998 | Convert to ENSCI/1% -> ENSCI/0.5%: R=0.96, P ≥ 30hPa R=0.90+0.041Log ₁₀ (P), P < 30 hPa ENSCI/0.5% = R * ENSCI1% ΔS ± 0.05 entire profile |
| Solution Volume | 0.5% Half Buffer | Entire record | α (absorption efficiency) = 1.0044-4.4x10 ⁻⁵ (P _{air}), 100 < P _{air} < 1050 hPa |
| Instrument | ENSCI | | |
| | SPC with 0.5% Half Buffer | 40 (1999-2000) | Convert SPC/0.5% -> ENSCI/0.5% R=0.96, P ≥ 30hPa R=0.764+0.133Log ₁₀ (P), P < 30 hPa ENSCI/0.5% = SPC0.5% / R ΔS ± 0.05 entire profile |
| Background Current | IB0, IB1, and IB2 recorded but mostly not applied. | | Use IB=IB2: Thresholds: IB < 0.05 μA ± 0.02 μA IB ≥ 0.05 μA ± 0.04 μA |
| PCF | 4AKOMHYR1986 | | SAKOMHYR1995 |
| Flowrate Correction | Not applied but Lab T, P, RH available | | Used: T=25C±5, RH=50%±25, P=1000hPa 1.58%, ΔC _{lab} = 0.003 |
| Pump Temperature | RS80, MODEM | | None (Internal pumpT) |
| Pressure offset | RS80 | | No GPS data |
| | MODEM | | None (GPS altitude not available) |

MORGANE Campaign April-July 2015 (Maïdo ObservatoRy Gas and Aerosol Ndacc Experiment) : blind test intercomparison between lidars (T°, O3, and water vapour) from OPAR and from NASA/GSFC mobile laboratory in view of the (re)labellisation of OPAR lidars in the NDACC :



Maïdo Observatory : 21.0°S 55.4°E 2154 masl

! In troposphere the displacement of the sonde trajectory with respect to the laser beam position could be large !

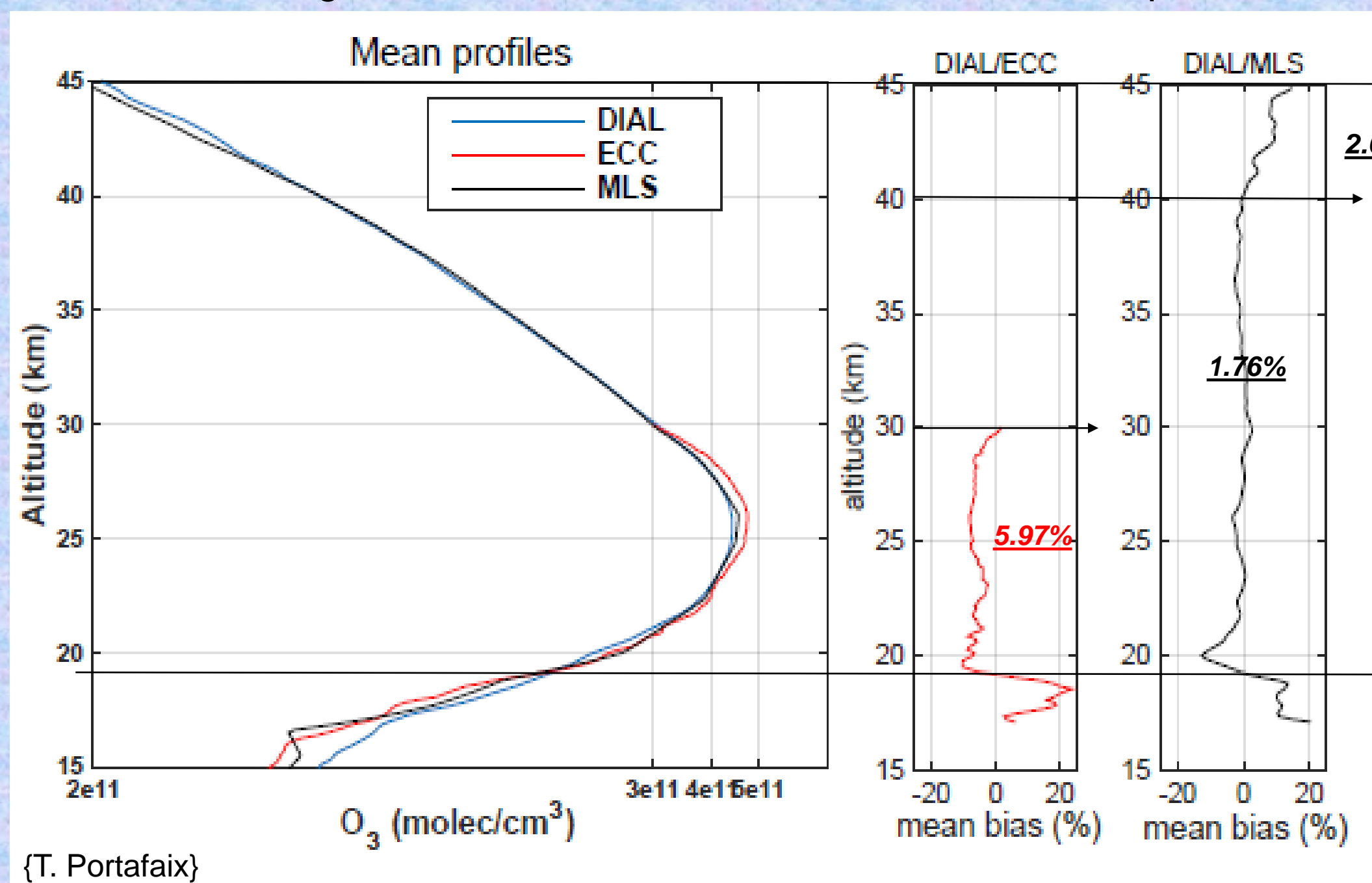


Left: mean ozone profiles (8): LIO3T and ECC +/- 1 sigma
Right: mean relative difference LIO3T/ECC +/- 1 sigma

63 day and night balloons launched : 10 ozonesondes, 20 M10 and RS92 radiosondes, 7 CFH, 5 COBALD, 1 LOAC

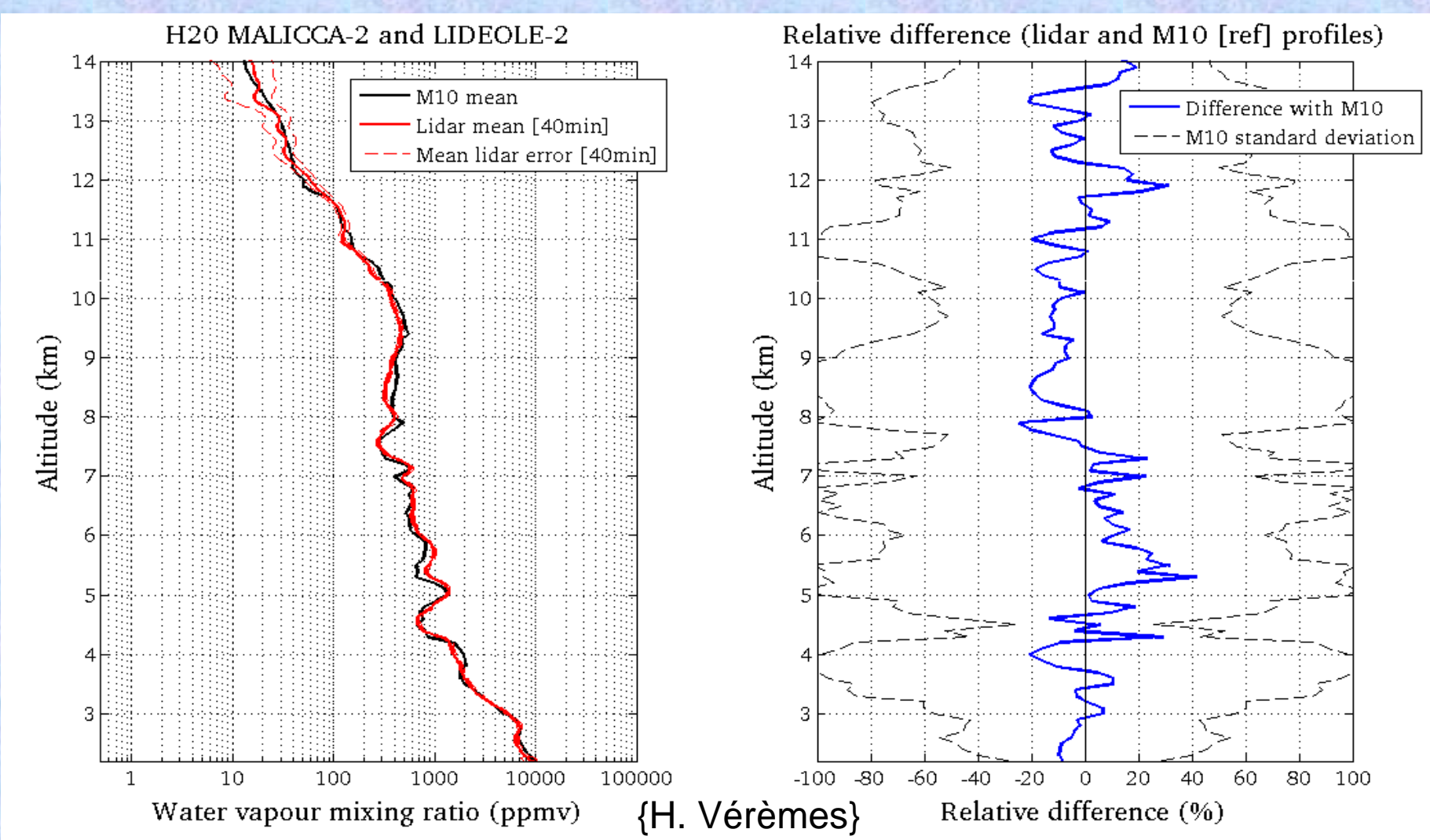
- Intercomparisons between Ozonesondes (ECC), Tropospheric (LIO3T) and Stratospheric (DIAL) lidars
- Comparisons between individual profiles show a mean agreement from 10.8% to 19.4% in the troposphere and from 3.1% to 10.3% in the stratosphere
- Comparison of the total ozone integrated column amount between the ozonesonde and OMI : from -6.0% to +5,9% and La Reunion SAOZ : from -4.0% to +4,1%

Between 17 and 20 km the stratospheric lidar's measurements were polluted by the presence of aerosols coming from Chili and due to Calbuco volcano eruption

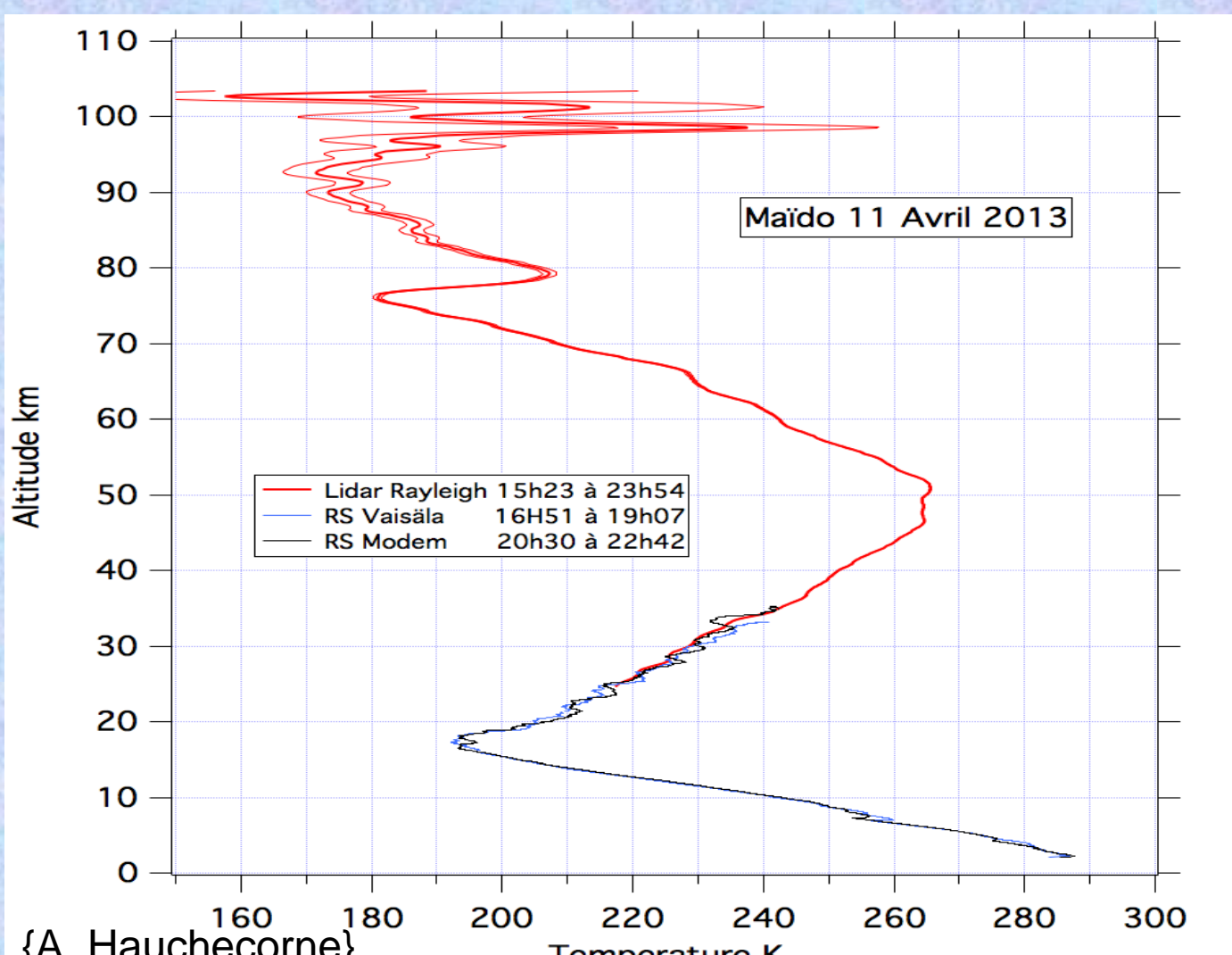


Mean profiles with 19 ECC, 45 DIAL and MLS between May and December 2015 (MORGANE campaign + NDACC routine measurements)

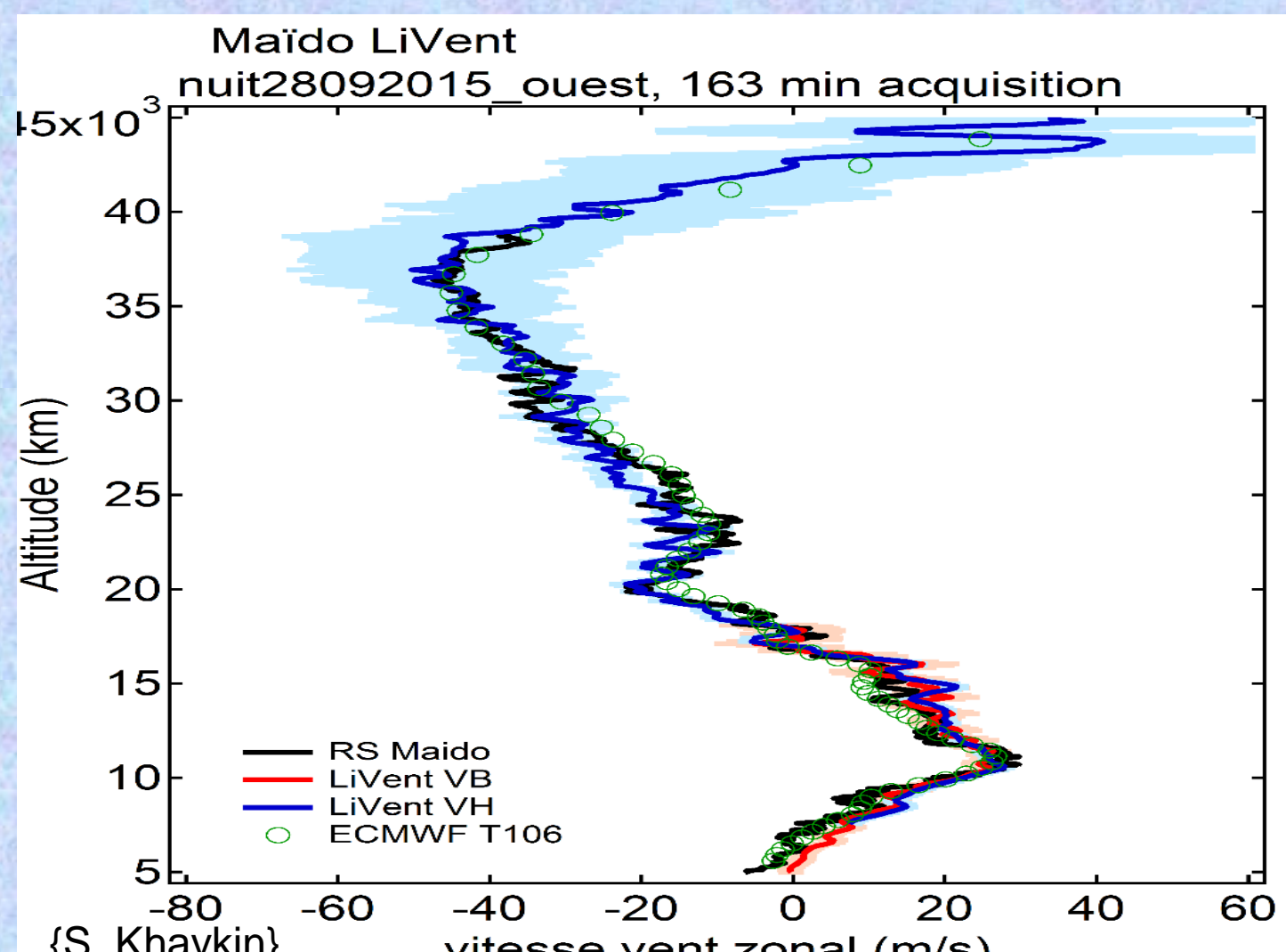
ANCILLARY COMPARAISONS : Water Vapor , Temperature and zonal wind



Water vapor Raman Lidar200 and 5 radiosondes Modem M10



T° lidar and 2 radiosondes representative profiles



Wind lidar (45°) and a radiosonde Modem M10 (up to 40km!)