La Reunion Island (21S, 55.5E) SHADOZ/NDACC station: First re-processed ozonesonde data and comparisons with lidar measurements at the Maïdo Observatory

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Quadriennal Ozone Symposium Edinburgh Scotland Sept 2016

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

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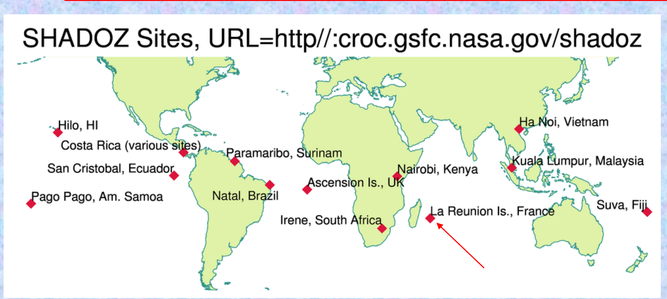
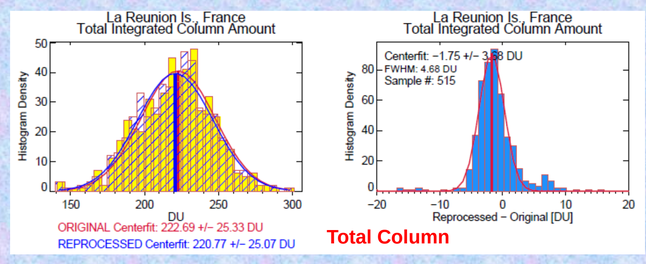
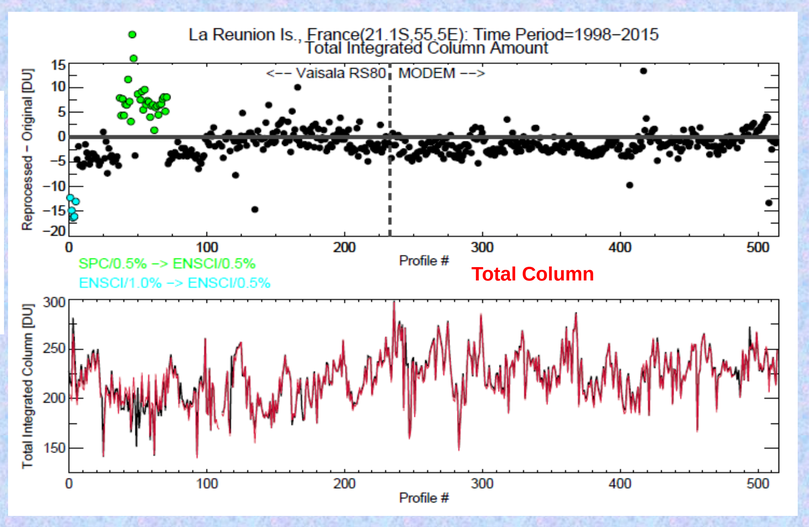
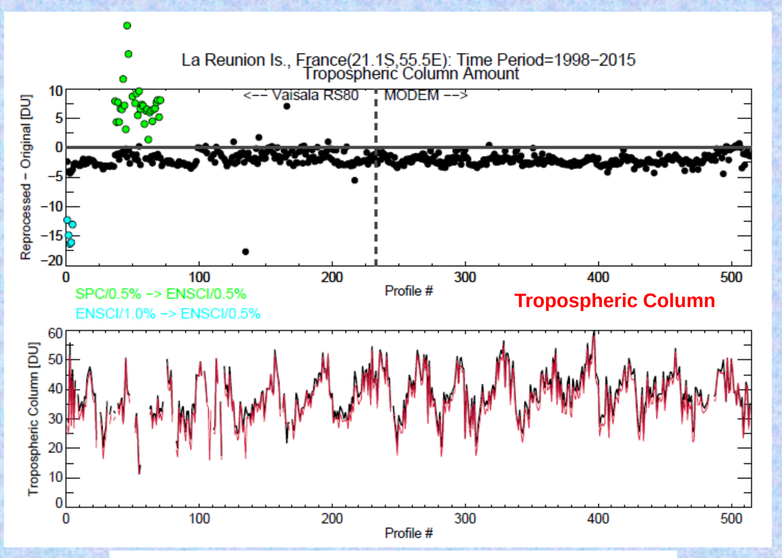
★ First reprocessed Ozone data (1998-2015)

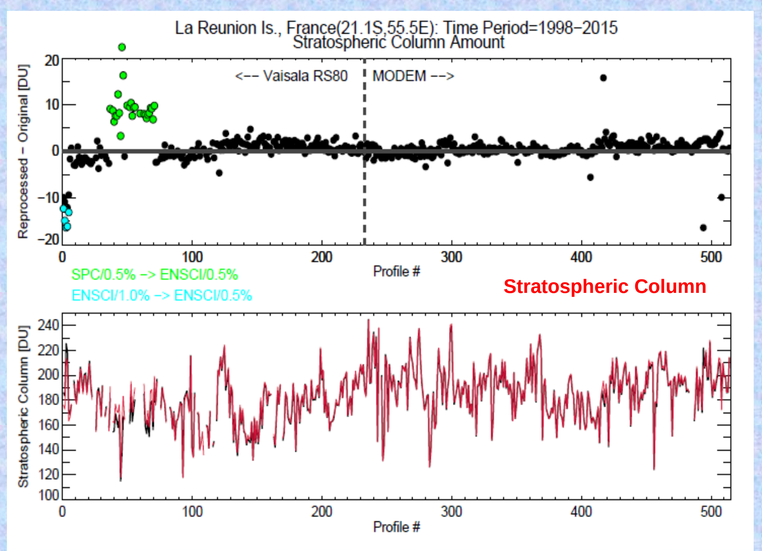


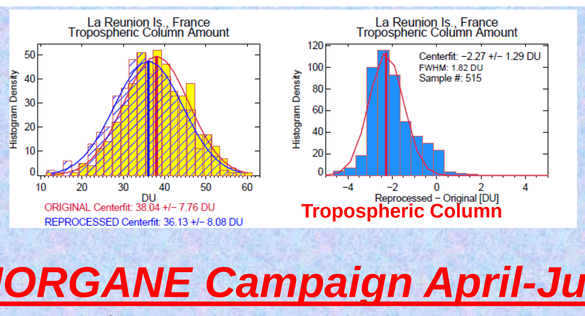
!! Preliminary results !!

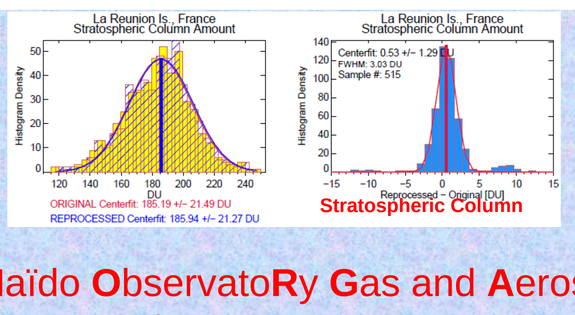












Applied Corrections

La Reunion, France (1998 – 2015) {J. Witte}

	Type	Timeline	Correction
Solution	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
	0.5% Half Buffer		
Solution Volume	2.5 cc	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 ENSCI0.5% = 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		5AKOMHYR1995
Flowrate Correction	Not applied but Lab T, P, RH available		Used: T=25C±5, RH=50%±25, P=1000hPa 1.58%, ΔC$_{ch}$ = 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

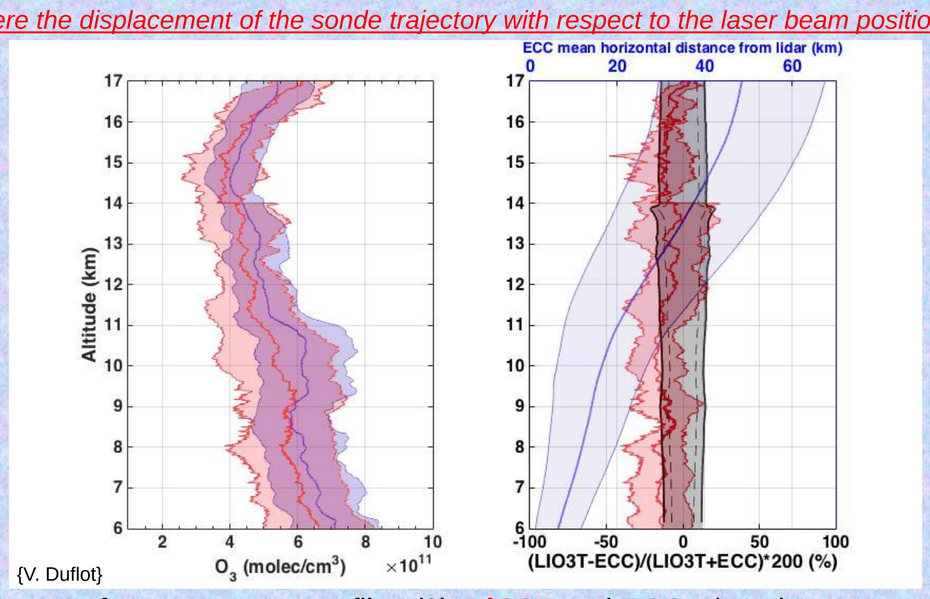
63 day and night balloons launched : 10 ozonesondes, 20 M10 and RS92 radiosondes, 7 CFH, 5 COBALD, 1 LOAC

- **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%

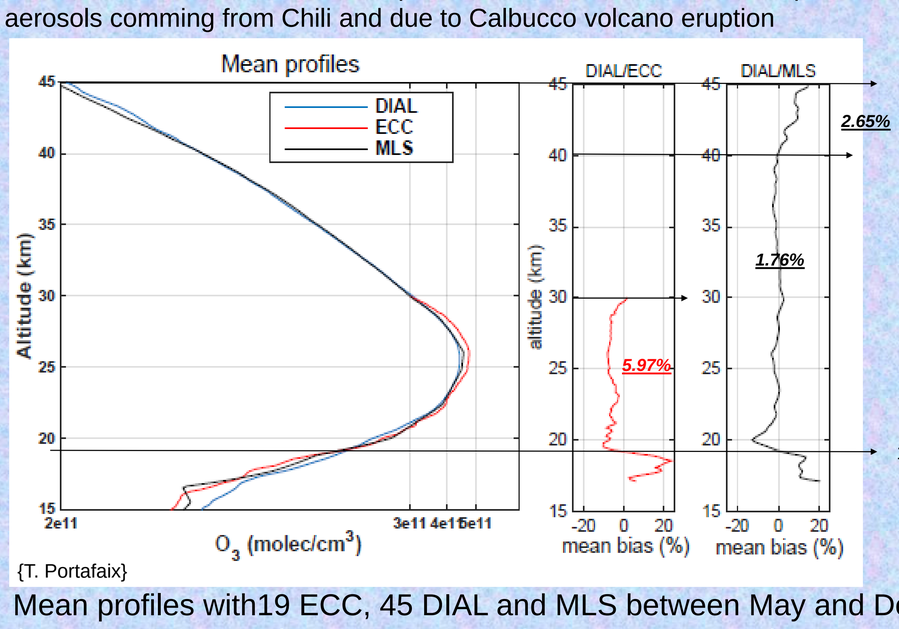
! In troposphere the displacement of the sonde trajectory with respect to the laser beam position could be large !



{V. Duflot}

Left: mean ozone profiles (8): **LiO3T** and **ECC** +/- 1 sigma
Right: mean relative difference LiO3T/ECC +/- 1 sigma

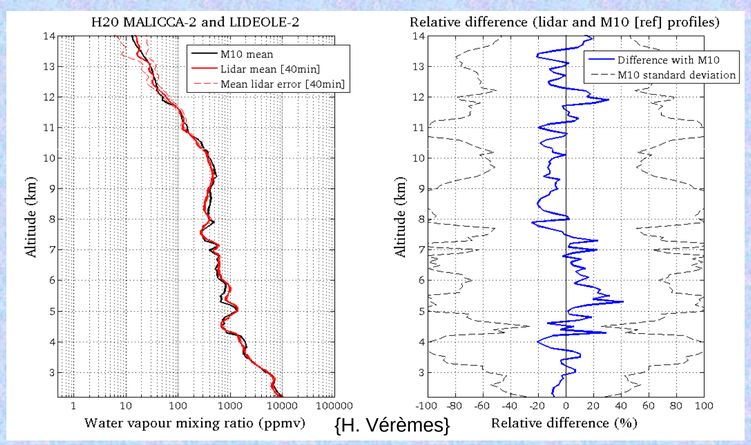
Between 17 and 20 km the stratospheric lidar's measurements were polluted by the presence of aerosols comming from Chili and due to Calbucco volcano eruption



{T. Portafaix}

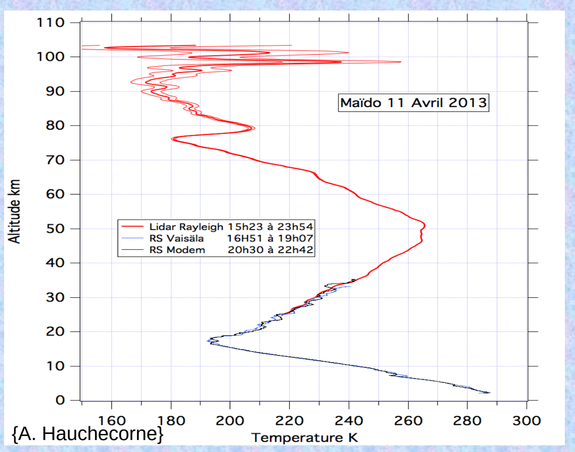
Mean profiles with19 ECC, 45 DIAL and MLS between May and December 2015 (MORGANE campaign + NDACC routine measurements)

★ ANCILLARY COMPARAISONS : Water Vapor , Temperature and zonal wind



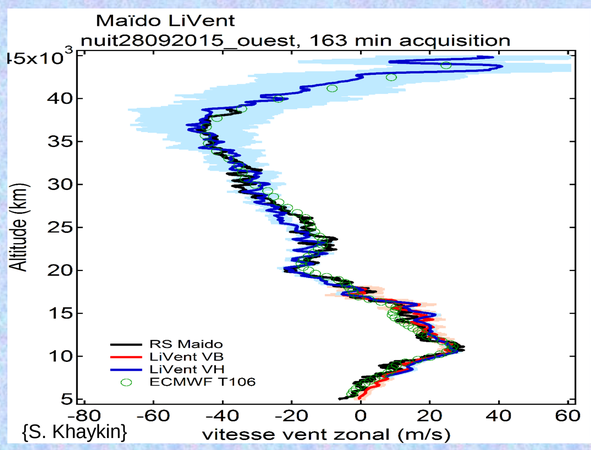
{H. Vérèmes}

Water vapor Raman Lidar1200 and 5 radiosondes Modem M10



{A. Hauchecorne}

T° lidar and 2 radiosondes representative profiles



{S. Khaykin}

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