



GAW WORKSHOP 2009
May, 5-7
World Meteorological Organization, Geneva

The Izaña GAW Report
Emilio Cuevas
Izaña Atmospheric Research Center
(AEMET)



Ozone & UV Program (1/3)



RBCC-E triad at Izaña



El Arenosillo, Sep 2007

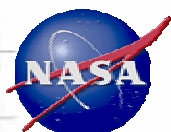


Arosa, July 2008

Regional Brewer Calibration Center for Europe (RBCC-E)

www.rbcc-e.org

3 international intercomparisons

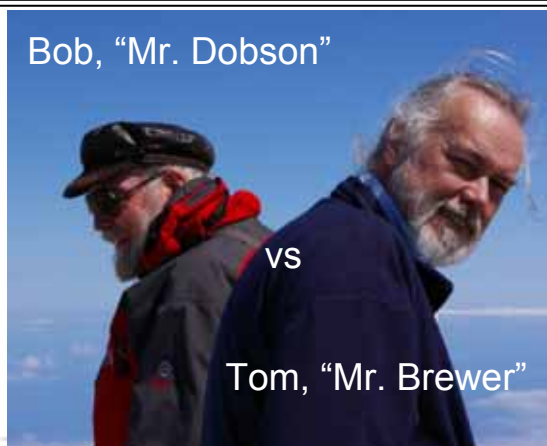


SAUNA

Sodankylä Total Column Ozone Intercomparison Campaign

March-April 2006 and 2007

Intercomparison of Brewer and Dobson reference instruments
Izaña, 7-27 September 2008



Bob, "Mr. Dobson"

vs

Tom, "Mr. Brewer"

#	Instrument	Institution	Investigator	Country
1	Dobson #083	NOAA	Bob Evans	USA
2	Dobson #064	DW-HOP	Ulf Kölher	Germany
3		DWD-MOHp	Bert Dömling	Germany
4	Dobson #074	CHMI-HK	Martin Stanek	Check Republic
5		CHMI-HK	Jiry Pokorny	Check Republic
6	Brewer #008	MSC	Tom McElroy	Canada
7		MSC	Tom Grajnar	Canada
8	Brewer #145	MSC	Volodya Savastiouk	Canada
9		MSC	I.Abboud	Canada
10	Brewer #157	AEMET-IZO	Alberto Redondas	Spain

ESA validation project: RBCC-E , RDCC-E (DWD) and Sodankyla Observatory (FMI)

Ozone & UV Program (2/3)

IV RBCC-E Calibration Campaign. El Arenosillo Atmospheric Sounding Station 7-17 September 2009



- Brewer-Dobson coordinated campaign
- World Radiation Centre QASUME unit for Ultraviolet Reference.
- Ozonesondes:
 - Umkehr Validation
 - Brewer-Dobson comparison

Registration deadline: June 30 (12 Brewer already registered, only 3 places available !!)



Ozone & UV Program (3/3)



Brewer#155 Artigas Antarctic Base (Uruguay); (62° S 59° W; South Shetland Islands) December 2007



Brewers#051 & #165 (Casablanca) Direction de la Météorologie Nationale (**Morocco**); 2005 & 2007



New double Brewer “twining” Izaña-Tamanrasset (Algeria)
Office Nationale de la Météorologie Nationale

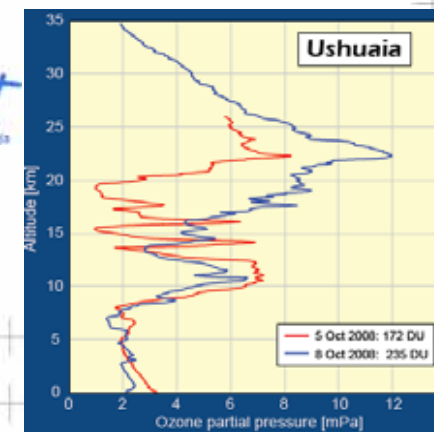
Izaña-Ushuaia “Twining”: New ozonesonde station



Global GAW Station (Argentina)



1st O3-sounding; April 14, 2008



Air Quality Program (1/1)

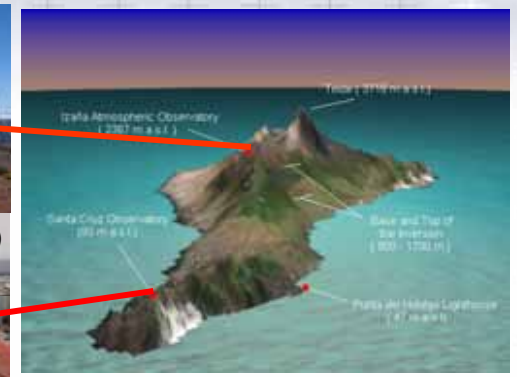
In situ Reactive Gases: CO , NO , NO2 , SO2

NDIR Analyzer: CO (IZO and SCO). At IZO there is also a GC.

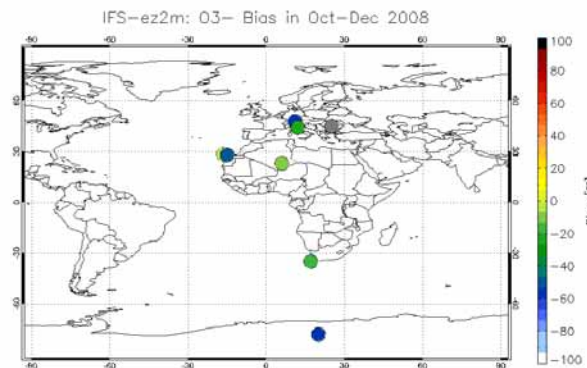
UV Pulsed Fluorescence Analyzer: SO₂ (IZO and SCO)

Chemiluminescence Analyzer: NO , NO_x , NO₂ (IZO and SCO).

DOAS: O₃, SO₂, NO₂, Toluene, Benzene, m- and p-xilene (SCO)



GEMS: “Global and regional Earth-system (Atmosphere) Monitoring using Satellite and in situ data”



ECMWF's integrated forecasting system (IFS) forecasting validation through the DWD

**CALIOPE
HYSPLIT**

Air Resource Laboratory



- NOAA's HYSPLIT model to calculate the emission, transport, dispersion and deposition of Arsenic and Sulfur Dioxide as emitted from several large nearby point sources.
- Langrangian-Eulerian hybrid model for dust forecast in Northern Africa
- Improvement of HYSPLIT parallelization

Radiation and Water Vapor Program (1/2)

BSRN



Data submission to BSRN since April 2009

New darkroom: horizontal, vertical and angular set-ups + integrating sphere
For: Brewer, Bentham, narrowband and broadband radiometers, and Cimel instruments

Radiation and Water Vapor Program (2/2)



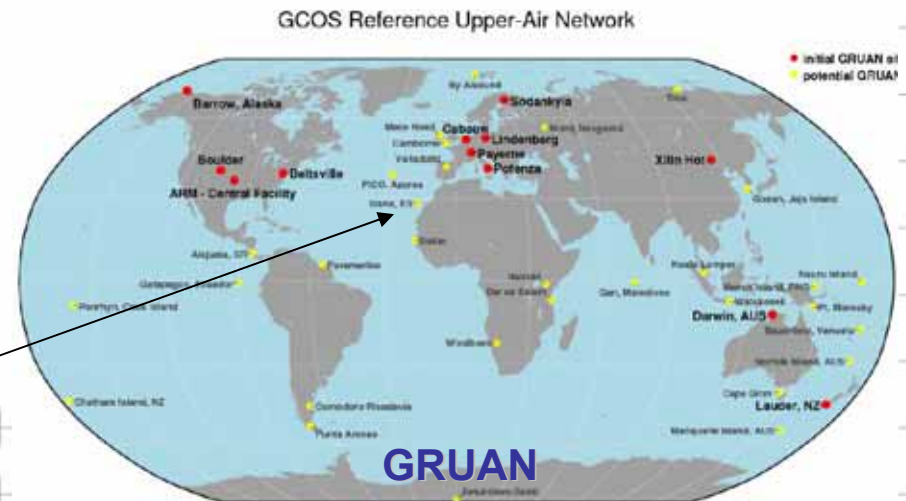
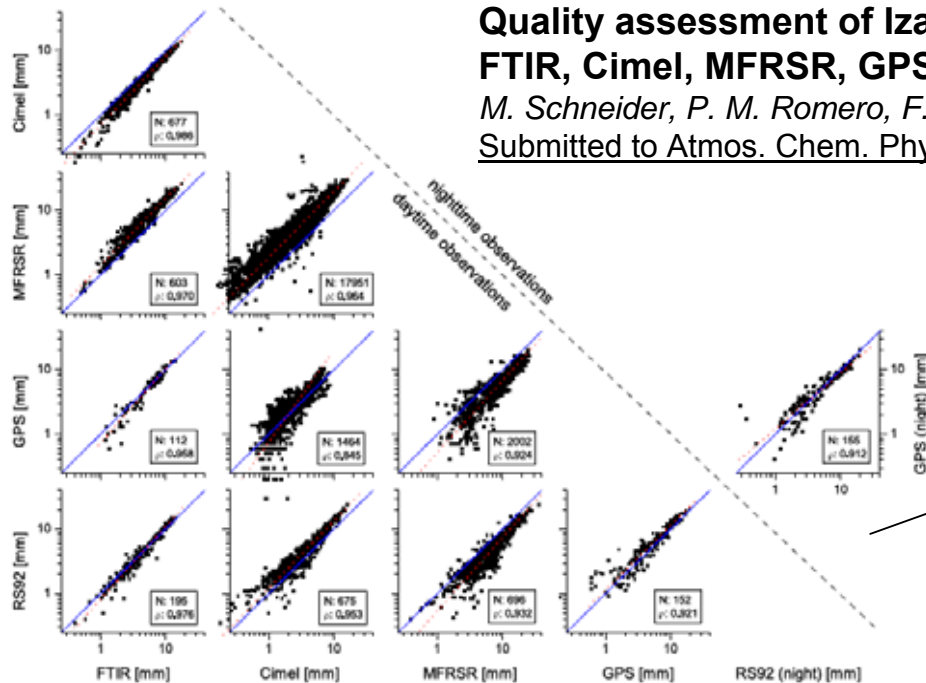
GPS-GLONASS at Izaña
July 2008



E-GVAP The EUMETNET GPS water vapour programme

Quality assessment of Izaña's upper-air water vapour measurement techniques: FTIR, Cimel, MFRSR, GPS, and Vaisala RS92

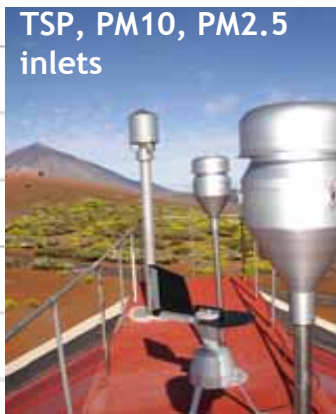
M. Schneider, P. M. Romero, F. Hase, T. Blumenstock, E. Cuevas, and R. Ramos
Submitted to Atmos. Chem. Phys.



Aerosols Program (1/3)

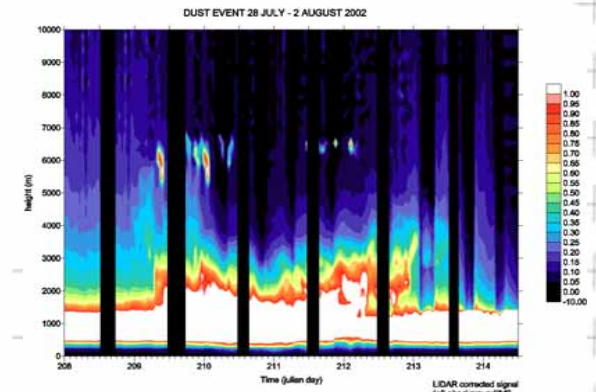
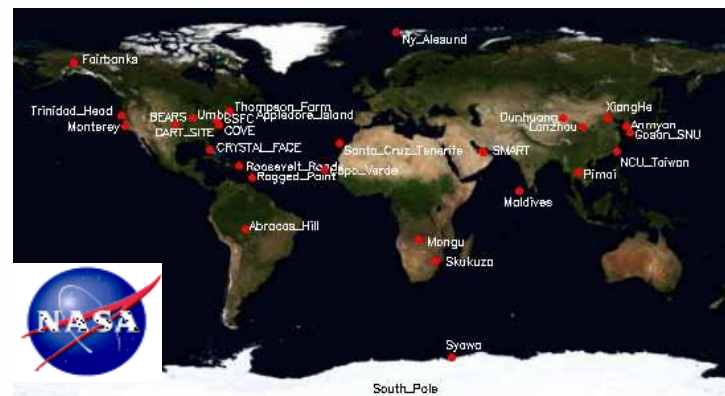
In-situ Aerosol/ African-dust characterization

- Number size distribution of coarse, fine and ultra-fine particles (3nm-20 μ m) (APS + SMPS)
- PM10 and PM2.5 levels and chemical composition: (dust, sea-salt, organic matter, black carbon, sulphate, nitrate, ammonium, trace elements)
- Total forward and backward scattering coefficients (3 λ) (integrating nephelometer)
- Absorption scattering coefficients (1 λ) (MAAP)



Micropulse Lidar at Tenerife since Nov.2005

<http://mplnet.gsfc.nasa.gov/>



Aerosols Program (2/3)

Izaña Sun & Sky Calibration Center

- NASA AERONET** (AErosol RObotic NETwork)
- PHOTONS** (PHOtométrie pour le Traitement Opérationnel de Normalisation Satellitaire)
- RIMA** (Red Ibérica de medida de Aerosoles Atmosféricos)



Ciel masters at Izaña

Bob Stone
BSRN
NOAA-USA

Izaña "supesite"

October 14, 2008

Victoria Cachorro
RIMA
GOA-UVA Spain



Abboud Ihab
AEROCAN
Canada

Vito Vitale
POLAR-AOD
CNR-Italy

Brent Holbern
AERONET
NASA-USA

Philippe Gouloub
PHOTONS
CNRS-France

Masataka Shiobara
NIPR
Japan

POLAR-AOD intercomparison

October 6-17, 2008

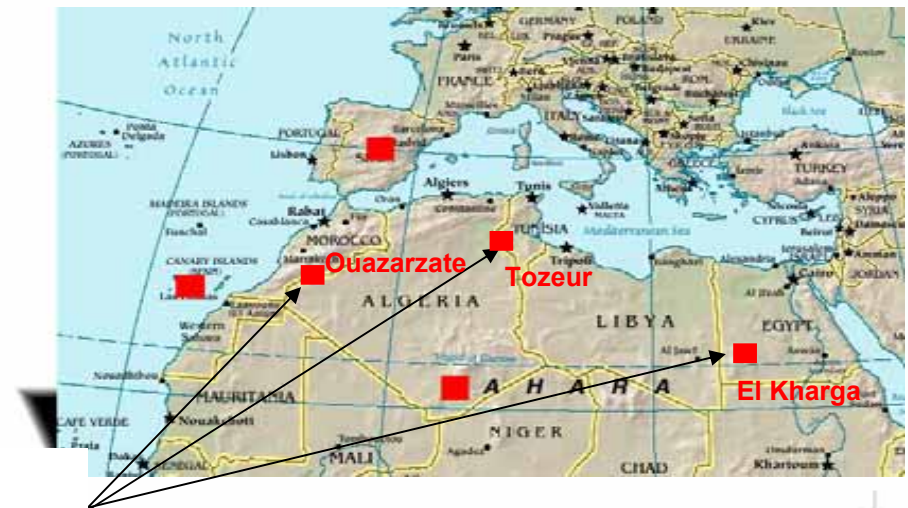


Aerosols Program (3/3)



SALAM (Saharan Air Layer Analysis and Monitoring)

Izaña-Tamanrasset “twining” September 2006



Cimet AERONET-PHOTONS station

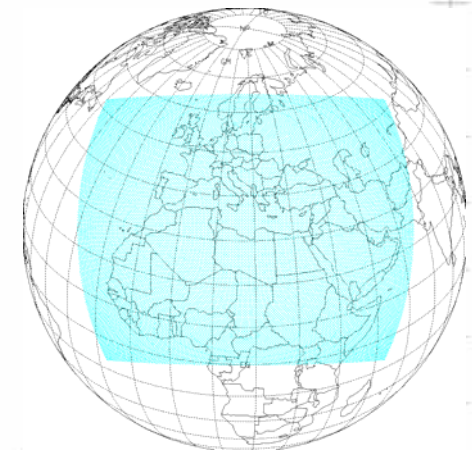


AGENCIA
ESPAÑOLA DE
COOPERACIÓN
INTERNACIONAL



**Barcelona
Supercomputing
Center**
Centro Nacional de Supercomputación

The Sand and Dust Storm Warning Advisory and Assessment System (SDS WAS) Regional Center for Northern Africa, Europe and Middle East

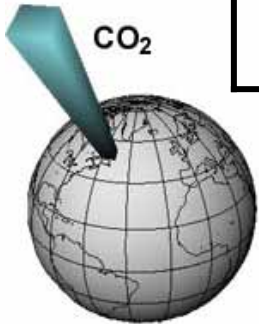


See Slobodan Nickovic's poster on Sand and Dust Storm Warning and Advisory System
Download papers from SDS WAS Barcelona meeting in IOP's open-access Earth and Environmental Science conference series Earth and Environmental Science www.iop.org/EJ/toc/1755-1315/7/1

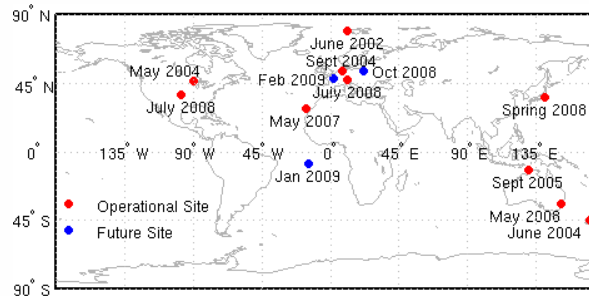
Greenhouse Gases & Carbon Cycle Program (1/1)

Audited by:
IMK/IFU
EMPA

New →
New →



Comp	Since	Present mean value	GAW required inter-laboratory comparability	Analyzer
CO ₂	1984	385 ppm	+/- 0.1 ppm	NDIR
CH ₄	1984	1800 ppb	+/- 2 ppb	GC-FID
N ₂ O	2007	320 ppb	+/- 0.1 ppb	GC-ECD
SF ₆	2007	6.5 ppt	+/- 0.02 ppt	GC-ECD
CO	1998	140 ppb	+/- 2 ppb	GC-RGA



TCCON (Total Carbon Column Observing Network)

<http://www.tccon.caltech.edu/>

FTIR instruments

See Warneke & Notholt, Thursday 7, 10h



To develop a low-cost instrument for total column CO₂

Tilted filter CO₂ photometer prototypes at Izaña:
Inversion algorithms and validation against FTIR and "In-situ" CO₂

Since last GAW Workshop in March 2005

- 33 peer-reviewed SCI papers
- 87 Oral presentations and posters in international meetings
- 5 Doctoral Thesis

- 25 Conferences and popular talks
- 7 Science popularization articles and non-peer reviewed papers

25 Years in GAW Program !!

