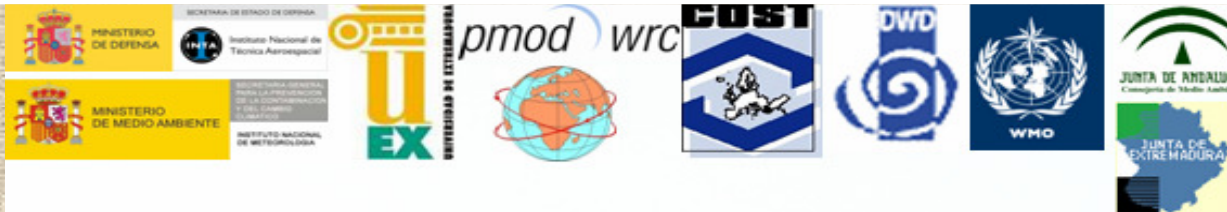


**Report from COST-726 Short Term  
Scientific Mission  
El Arenosillo, Spain  
September, 2007.**

Gregor Hülsen  
&  
Grzegorz Zablocki





## INTERNATIONAL CALIBRATION CAMPAIGN: DOBSON, BREWER & BROADBAND

Place: INTA/CEDEA

INTA / El Arenosillo (Huelva) Spain.

### BROADBAND CAMPAIGN

**ORGANIZER:**

INTA

University of Extremadura

PMOD/WRC (World Radiation Center)

COST-726

**Masters:** Indoor calibration facilities at "El Arenosillo",

QASUME Unit

**Participants:** Up to 30 instruments

(1 per network)

**Date:** from August 15th to September 21st 2007

### DOBSON CAMPAIGN

**ORGANIZER:**

WMO/ RDCC RA-VI (Regional  
Dobson Calibration Centre-  
Europe), INTA

**Master:**

Dobson # 064 (RDCC RA-VI)

**Date:** 1st to 15th September

### BREWER CAMPAIGN

**ORGANIZER:**

WMO/RBCC-E (Regional Brewer  
Calibration Centre-Europe), INTA

**Master:**

Brewer # 185 (INM),

Brewer # 017 (IOS),

QASUME Unit (WRC)

**Date:** 1st to 15th September



## 16 Brewer and 2 Bentham





## 6 Dobson





## 25 UV Broadband Radiometers





**September 20th and 21st:**

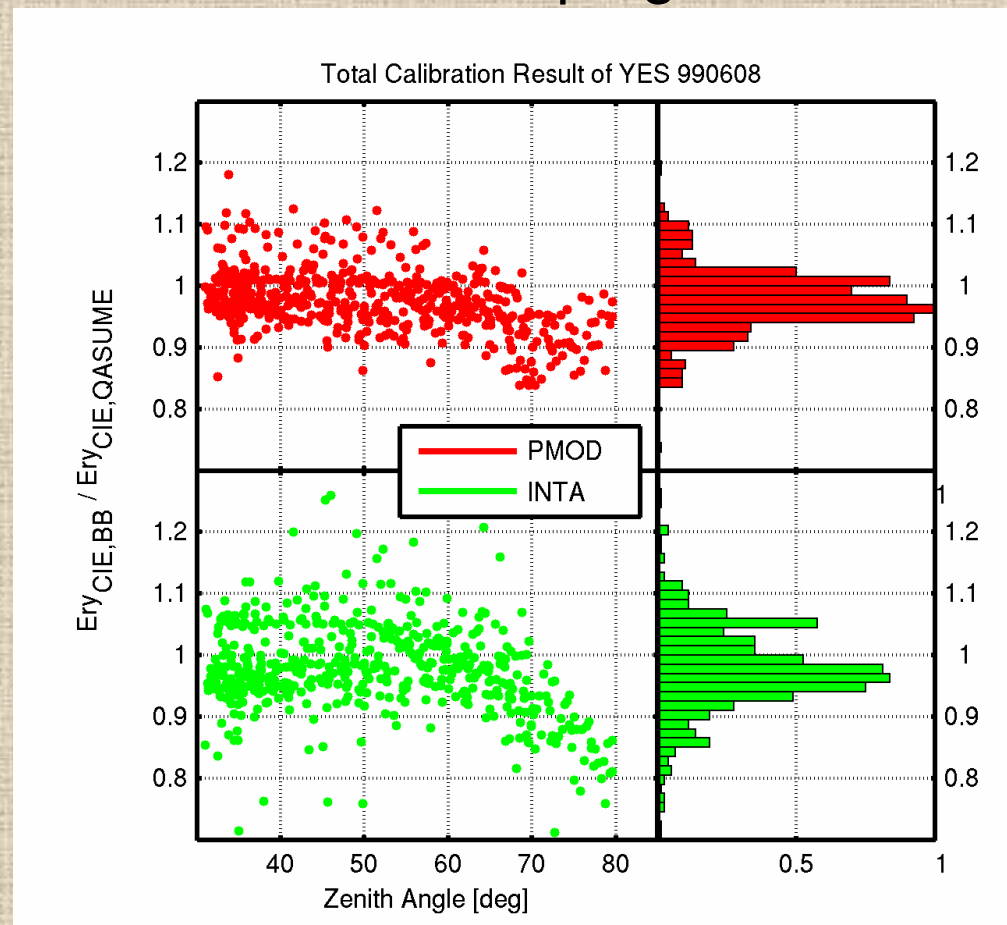
**Training Seminar for Broadband Radiometers Operators**

1. Introduction to the solar UV radiation. Action spectra
2. Measurements of the UV radiation. Instrumentation
3. Calibration procedures
4. WMO/COST-726 Protocol description : Installation and use of UV-Broadband instruments measuring erythemally weighted irradiance.
5. Main uncertainties and error sources
6. Software tools for data processing
7. Practical exercises for the operators
8. Visit to INTA



# Reference instruments QASUME and YES 990608

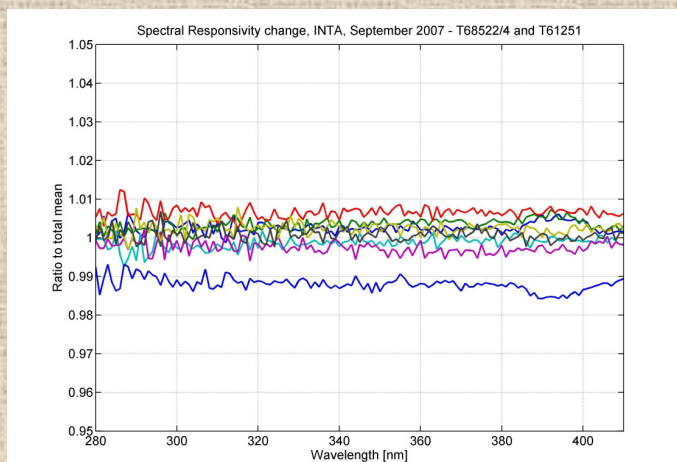
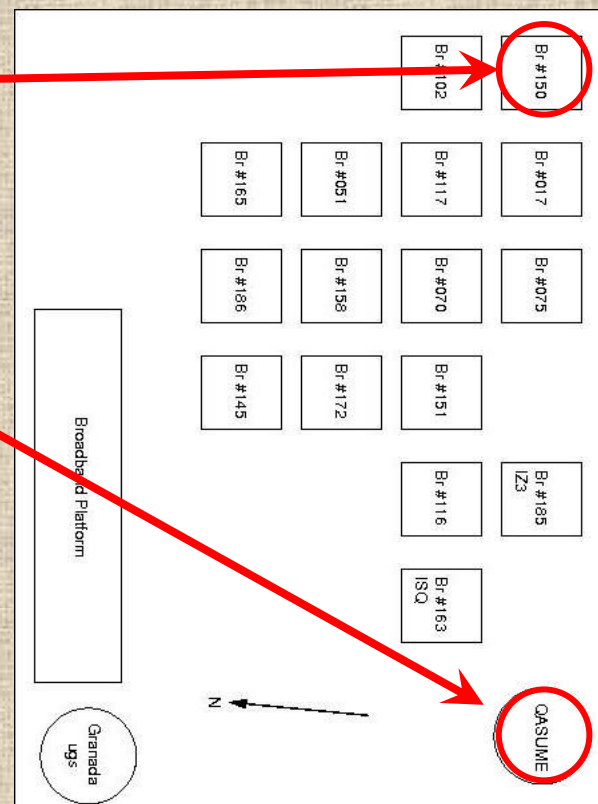
Performance during the PMOD/WRC-COST 726  
Broadband campaign, 2006





# 2<sup>nd</sup> RBCC-E

## and Broadband campaign at INTA, 2007 Setup and performance of the transportable reference spectroradiometer QASUME

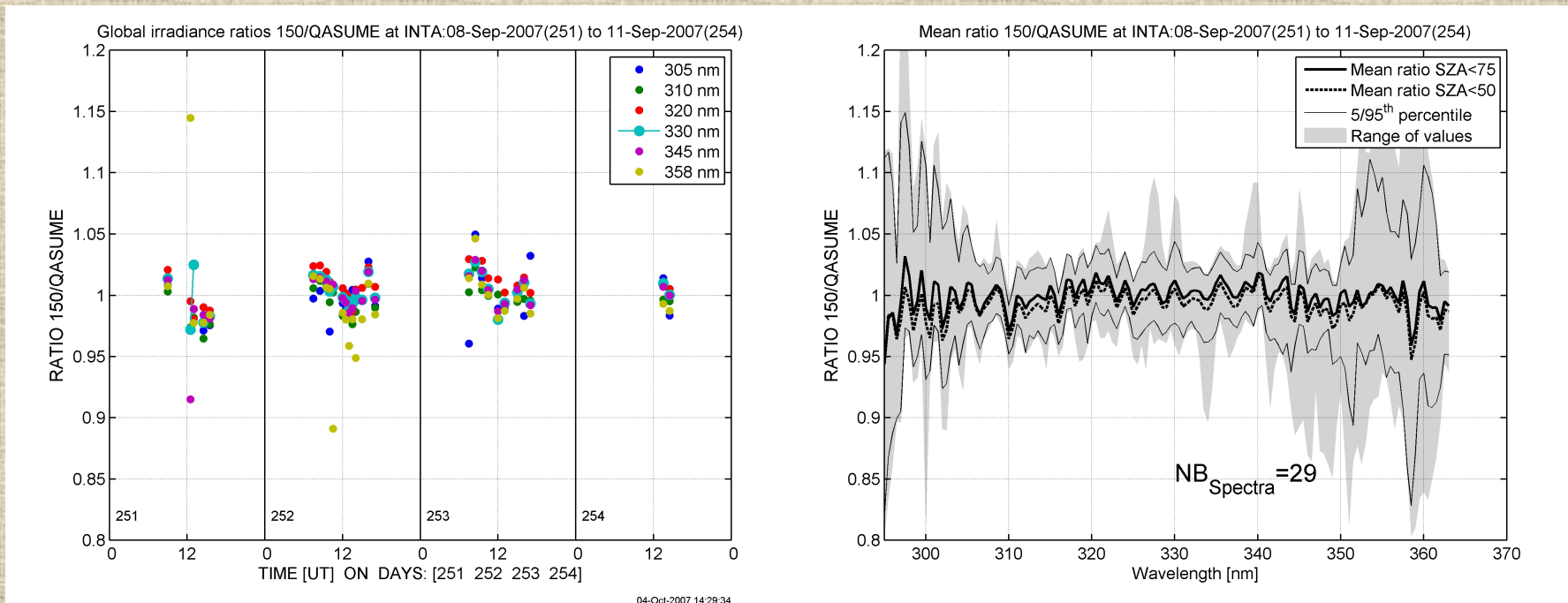






# Reference instruments QASUME and Brewer #150

## Performance during the 2<sup>nd</sup> RBCC-E and Broadband campaign, 2007







# Calibration comparison of the YES990608 at PMOD/WRC and INTA

Comparison of UV Calibration	PMOD/WRC	INTA	PMOD/INTA %
Diffuse cosine error	0.88	0.87	+1
Clear sky cosine correction factor SZA=40	1.088	1.100	-1.1
Absolute Calibration Factor TO <sub>3</sub> =300 DU, SZA=40°	0.1199	0.1183	+1.4





Report from the COST-726 Short Term Scientific Mission  
2nd RBCC-E and UV broadband campaign  
28 August - 14 September, 2007  
El Arenosillo, Spain.

Grzegorz Zablocki





**APPLICANT:**

Grzegorz Zablocki

Centre of Aerology

Institute of Meteorology and Water Management (IMWM)

Zegrzynska 38,

05-119 Legionowo

Poland

**HOST INSTITUTION:**

Dr Jose Manuel Vilaplana Guerrero

Instituto Nacional de Técnica Aeroespacial - INTA

Dpto. de Observación de la Tierra, Teledetección y Atmósfera

Estación de Sondeos Atmosféricos "El Arenosillo"

Ctra. San Juan del Puerto - Matalascañas Km.33

21130 Mazagon, Huelva

Spain



The Short Term Scientific Mission was aimed at:

- participating in the broadband campaign with one's own instrument
- installing broadband instruments on outdoor platform
- operating of one's own instrument (time synchronisation, data gathering)
- performing daily inspections (checking of instrument's levelling, domes cleaning)
- getting knowledge on calibration methodology
- assisting in/performing of spectral/angular characterisation of broadband instruments
- performing some data analysis using one's own computer and Matlab software



**During 2nd RBCC-E and UV broadband campaign, three types of instruments were compared and calibrated: UV broadband radiometers, Brewer spectrophotometers, Dobson ozone spectrophotometers. The reporter took part in UV broadband radiometers campaign and performed the following actions:**

- *familiarised with laboratory equipment and calibration methodology***
- *helped with installation of broadband instruments on the outdoor platform***
- *fixed some problems with electrical connections***
- *wrote a Matlab program for calculating of direct, diffuse and global correction factor from an angular response of the instrument***
- *wrote a program for reprocessing solar spectra obtained by spectrophotometers allowing for cosine correction of the instruments***
- *wrote and operated a program for real time collecting of data from the digital Solar Light UV Biometers, based on PMOD/WRC subroutines given by Gregor Hülsen (the program was used during the spectral/angular characterisation of the digital instruments)***



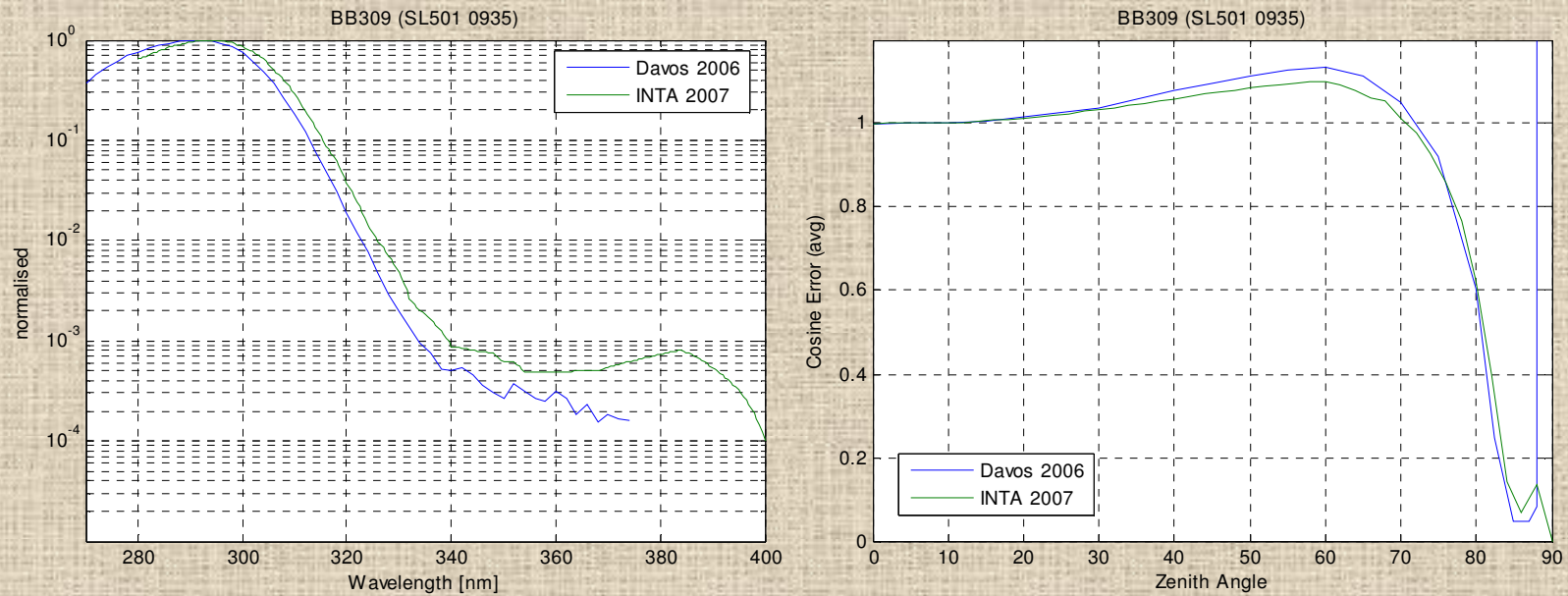


Figure 1. Comparison of angular and spectral responses of BB309 (SL501 #0935 – reference radiometer for IMWM UV monitoring network) obtained from both Davos and INTA campaign.



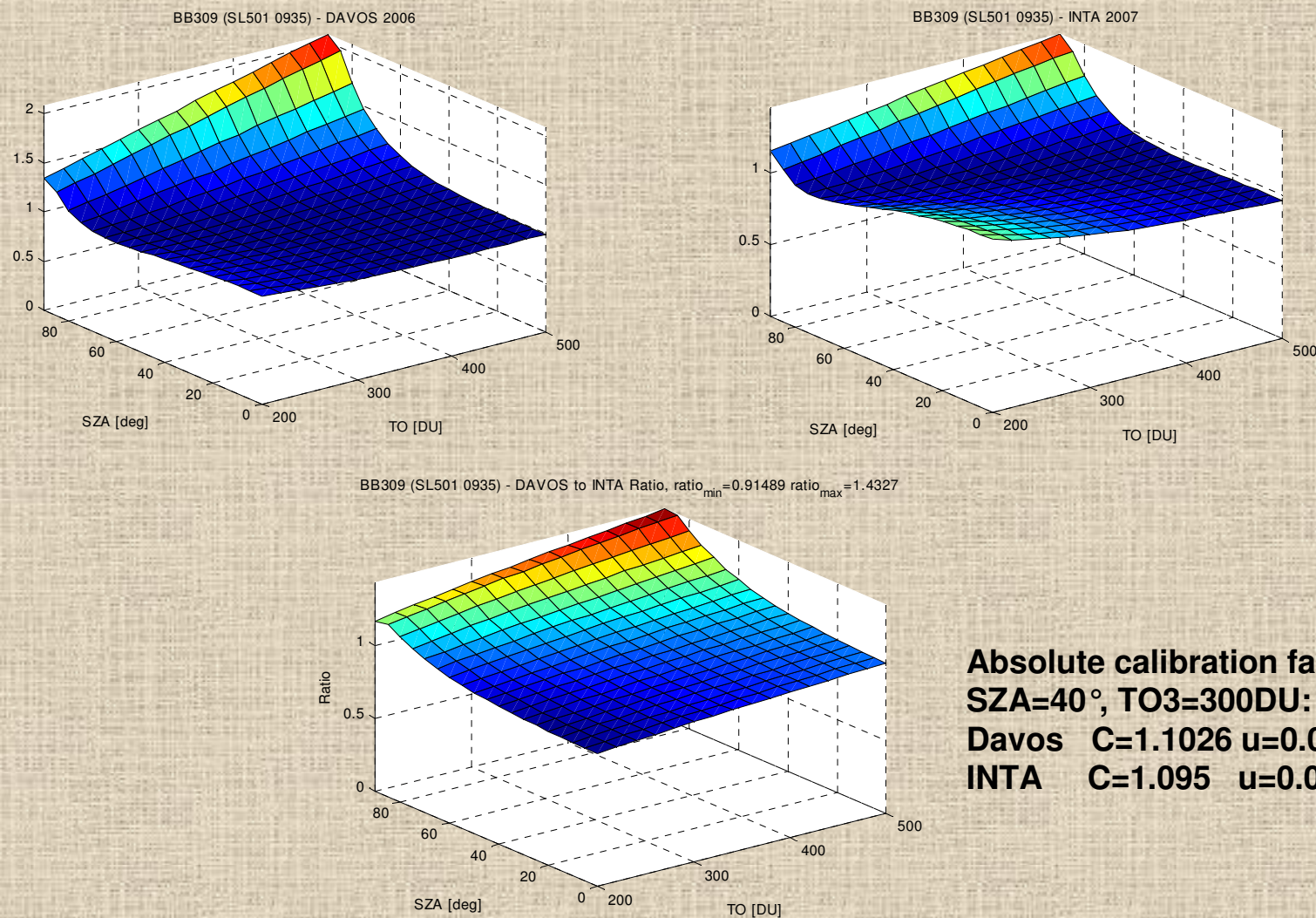


Figure 2. Comparison of calibration matrixes of BB309 (SL501 #0935) obtained from both Davos and INTA campaign.



## Grzegorz Zablocki **CONCLUSIONS**

- The mission allowed the scientist to support the organisers with the UV broadband campaign
- The scientist got knowledge of calibration of UV broadband radiometers
- The scientific and infrastructure quality of the host was very good for the mission's objectives

*I wish to thank the organizers and colleagues from University of Extremadura in Badajoz for their kindness and care.*