STATUS OF THE IZAÑA BSRN STATION

R.D García[1,2], E. Cuevas[1], R. Ramos[1] , P.M. Romero-Campos[1] , V.E Cachorro[2], and A.M de Frutos[2]

([1]) Izaña Atmospheric Research Center, Agencia Estatal de Meteorología (AEMET),Spain (rgarciac@aemet.es)
([2]) Atmospheric Optics Group, Valladolid University (GOA-UVA), Spain

The Izaña Atmospheric Observatory (IZA) is part of the Global Atmospheric Watch (GAW) programme and is managed by the Izaña Atmospheric Research Center (IARC) belonging to the Meteorological State Agency of Spain (AEMET). It is located in the Tenerife Island (Canary Island) at 28º18' N, 16º29' W, 2.367 m a.s.l, above a quasi-permanent inversion layer, consequently it offers excellent conditions for *in situ* measurements of trace gases and aerosols under "free troposphere" conditions and for remote sensing atmospheric observations. The environmental conditions (stable total column ozone, very low column water vapour and low aerosols content) and the high frequency of clean and pristine skies make IZA to be optimal for calibration and validation activities. The radiation site in Izaña is part of BSRN since March 2009. (www.aemet.izana.org/bsrn_iza)

IZAÑA BSRN STATION

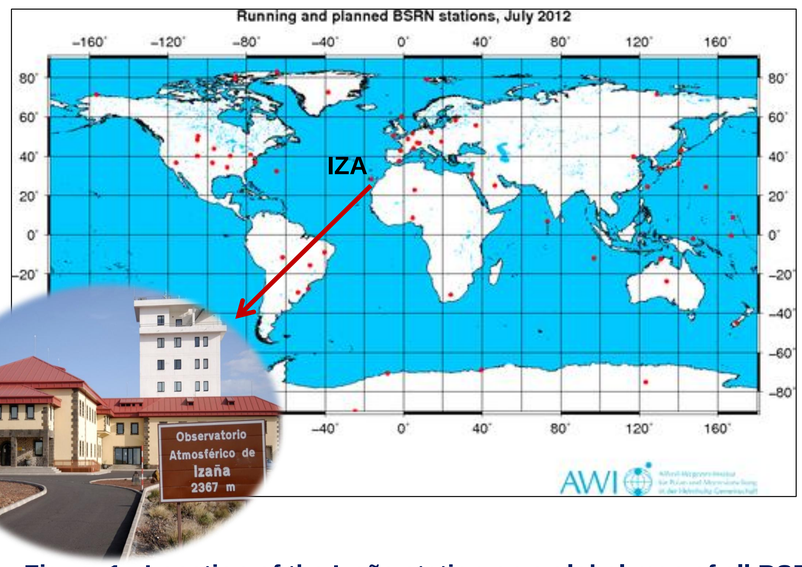

Figure 1.- Location of the Izaña station on a global map of all BSRN stations (http://www.bsrn.awi.de)

INSTRUMENTS AND MEASUREMENTS

Figure 2.- Instruments installed at the IZA BSRN.

BASIC MEASUREMENTS

- Global Radiation
- Direct Radation
- Diffuse Radiation
- Longwave Downward Radiation (LWdn)

EXPANDED MEASUREMENTS

- UV-A
- UV-B
- Aerosol Optical Depth
- Total Ozone Column
- Vertical distribution of pressure, air temperature, relative humidity, wind speed and wind direction
- Short and longwave upward radiation

BSRN RECOMMENDED QUALITY CONTROL

The measured data are tested againt physically possible (Gilgen et al., 1995) and globally extremely rare limits as defined and used in the BSRN recommended data quality control (QC) testing developed by Long and Dutton (2002). Table 1 shows a summary of the percentage of data failed the QC tests between 2009 and 2011.

		Global SW			Diffuse SW			Direct SW			LWdn		
	Year	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011
Physically Possible	Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Max	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0			
Extremely Rare	Min	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Max	0.0	0.1	0.1	0.5	1	0.4	0.0	1.2	0.0			
Glob SW/Sum SW	SZA<75º	1.3	2.3	3.1									
	75º<SZA<93º	2.9	5.3	6.5									
Diff SW/Glob SW	SZA<75º				0.3	0.0	0.0						
	75º<SZA<93º				0.0	0.2	0.0						
LWdn vs Ta											0.0	0.0	0.0

Table 1.- Percentage of data failed the QC test in 2009, 2010 and 2011 at the IZA station (Long and Dutton, 2002).

In general, the results are very successful with the measurements satisfied the physically possible and globally extremely rare limits.

MODEL COMPARISONS

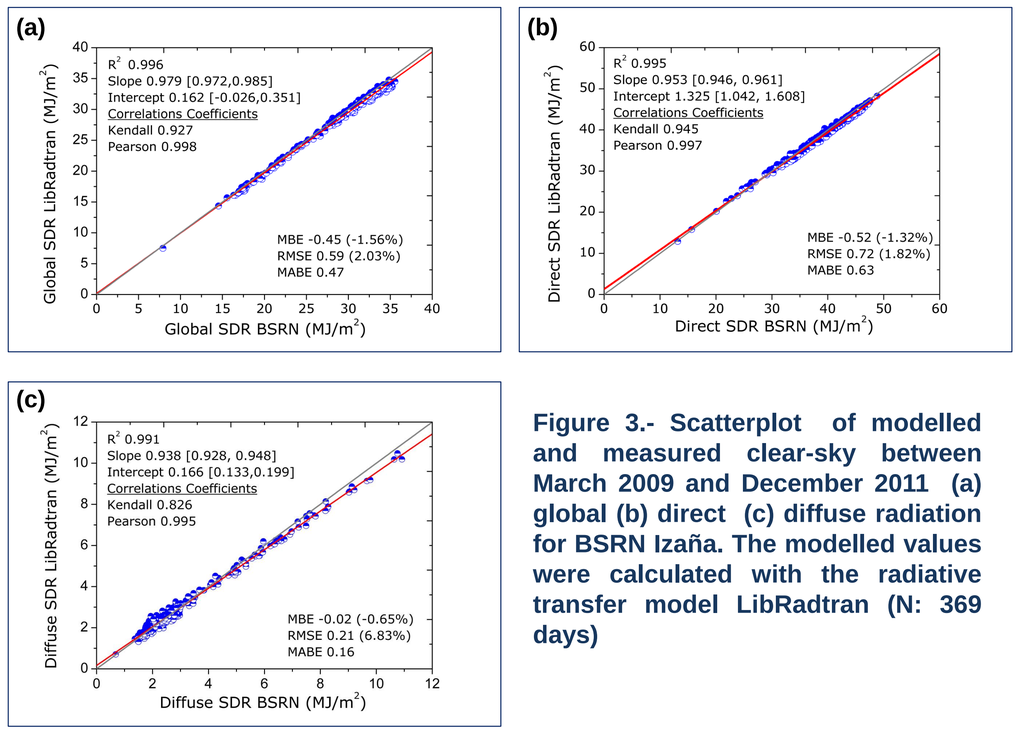

Figure 3.- Scatterplot of modelled and measured clear-sky between March 2009 and December 2011 (a) global (b) direct (c) diffuse radiation for BSRN Izaña. The modelled values were calculated with the radiative transfer model LibRadtran (N: 369 days)

There is a good agreement between simulations performed with LibRadtran model and observations for the global radiation with MBE -1.56% and RMSE 2.03%. The differences are very low for direct radiation where MBE is -1.32% and RMSE 1.82%. In the case of diffuse radiation, there is a larger difference between observations and simulations, where RMSE is 6.83%. (García, 2011).

BSRN DATA SERIE AT IZA

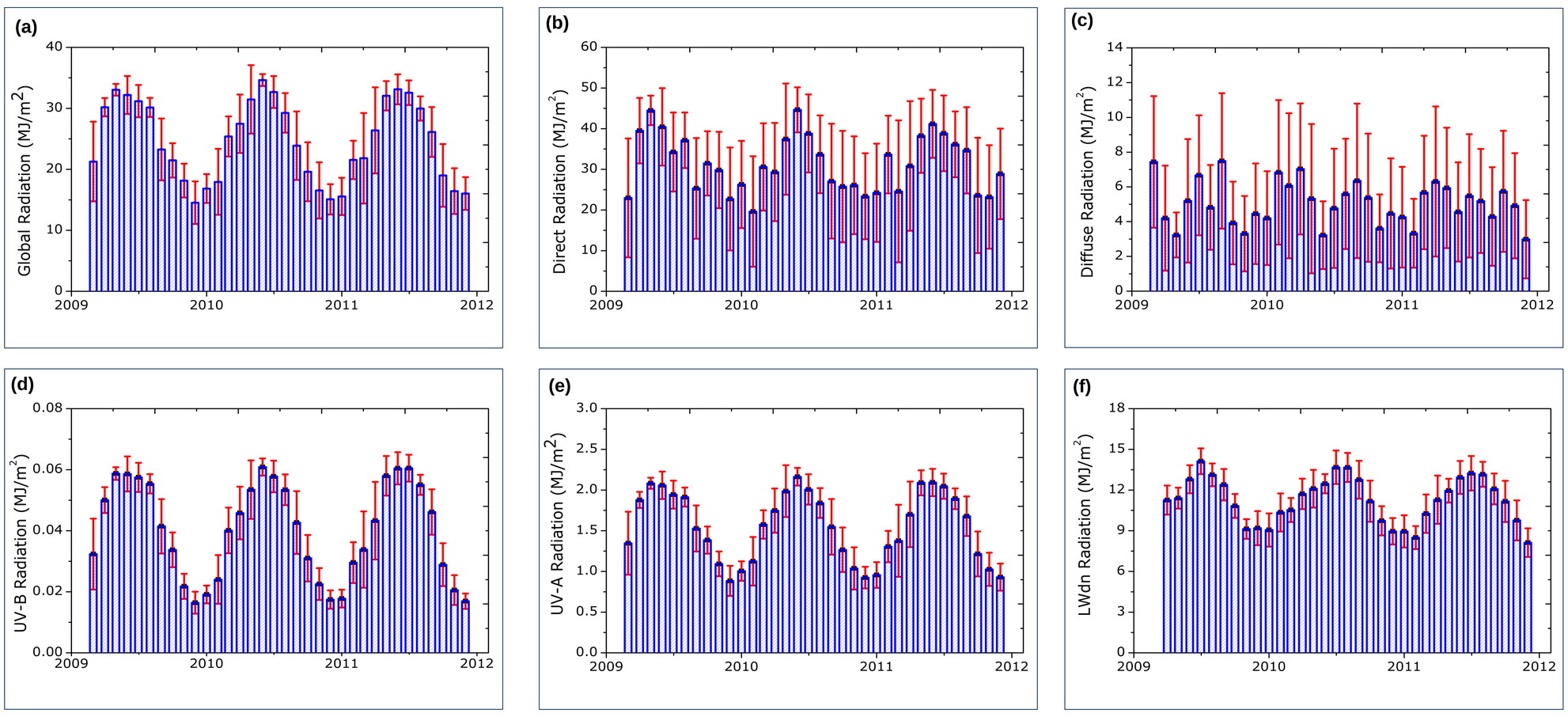

Figure 4.- Monthly means of (a) global radiation, (b) direct radiation, (c) diffuse radiation, (d) UV-B, (e) UV-A and (f) longwave downward radiation (LWdn) between March 2009 and December 2011 measured at IZA BSRN. The error bars show the standard deviations in the measurements.

References

García, R.D.: Aplicación de modelos de transferencia radiativa para el control operativo del programa BSRN (Baseline Surface Radiation Network) del Centro de Investigación Atmosférica de Izaña, Ph.D. thesis, Valladolid University, Spain, 2011.

Gilgen, H., C. Whitlock, F. Koch, G. Müller, A. Ohmura, D. Steiger y R. Wheeler. *Technical Plan for BSRN (Baseline Surface Radiation Network) Data Management*. Version 2. WMO/TD-No. 443, WCRP/WMO, (1995).

Long C.N. y E.G. Dutton. *BSRN Global Network recommended QC tests, V2.0*, BSRN Technical Report, (2002).

Acknowledgements: This work was developed under the Specific Agreement of Collaboration between the Meteorological State Agency of Spain and the University of Valladolid regarding radiometry, ozone and atmospheric aerosol programs conducted at Izaña, and for the adaptation and integration of the AEMET CIMEL network following the AERONET-RIMA standards". Financial supports from the Spanish MICIIN for projects CGL2009-09740, CGL2011-23413 and CGL2010-09480E, CGL2011-13085-E are gratefully acknowledged.