STATUS OF THE IZAÑA BSRN STATION

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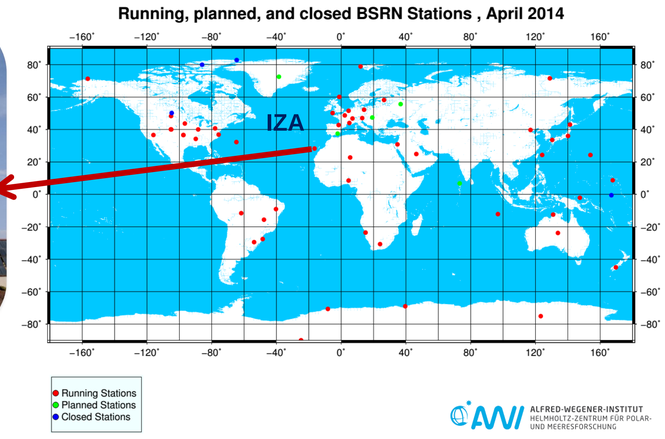
Figure 1.- From right to left: location of the Izaña station (IZA) on a global map of all BSRN stations (http://www.bsrn.awi.de), main building, and IZA BSRN instruments installed on the top of the observation white tower.



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 (The Canary Islands; 28º18' N, 16º29' W, 2.367 m a.s.l) above a quasi-permanent inversion layer with excellent conditions for *in situ* and column measurements of trace gases and aerosols under "free troposphere" conditions. The environmental conditions (stable total column ozone, very low precipitable water vapour and low aerosols content) and the high frequency of clean and pristine skies make IZA an optimal site for calibration and validation activities. In fact, IZA is a WMO-CIMO Testbed for Aerosols and Water Vapor Remote Sensing Instruments and the WMO Regional Brewer Calibration Center for Europe (RBCC-E) . The radiation site in Izaña is part of BSRN since March 2009. (http://www.bsrn.aemet.es/)

QUALITY CONTROL AND CALIBRATIONS

CALIBRATION OF PYRHELIOMETERS AND PYRANOMETERS BY COMPARISON TO A REFERENCE PYRHELIOMETER.

As part of the radiation quality assurance system a calibration campaign of BSRN pyranometers and pyrheliometer was performed during 2014 using as reference an Absolute Cavity Pyrheliometer PMO6 (see Figure 3), calibrated in the World Radiation Center (Davos) and following the ISO 9059:1990 (E) and ISO 9846:1993(E). This calibration will be performed every 12 months from now on and compared with routine calibrations performed with LibRadtran model (see Figure 4) described in García et al. (2014a).

Figure 2.- Calibration certificates of the pyrheliometer CH-1 #08050, WRCM 61003 and the pyranometer CM-21 #080304, WRCM 61001.

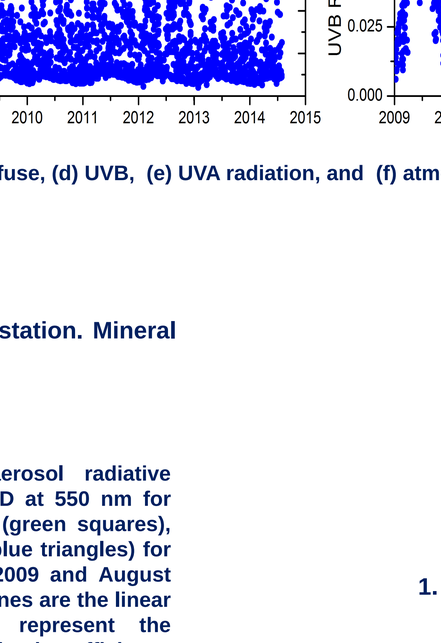


Figure 3.- . Absolute Cavity Pyrheliometer (PMO6) installed at IZA during summer 2014 in the tracker of the BSRN.

MODEL COMPARISONS

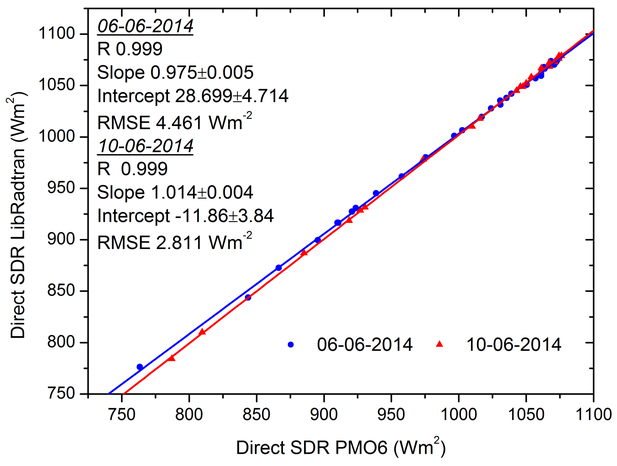


Figure 4.- Scatterplot of modelled versus measured (PMO6) direct radiation (Wm $^{-2}$) at BSRN Izaña on 6th and 10th June 2014. The least-square fit parameters and the root mean square error (RMSE) are shown in the legend.

BSRN DATA SERIE AT IZA

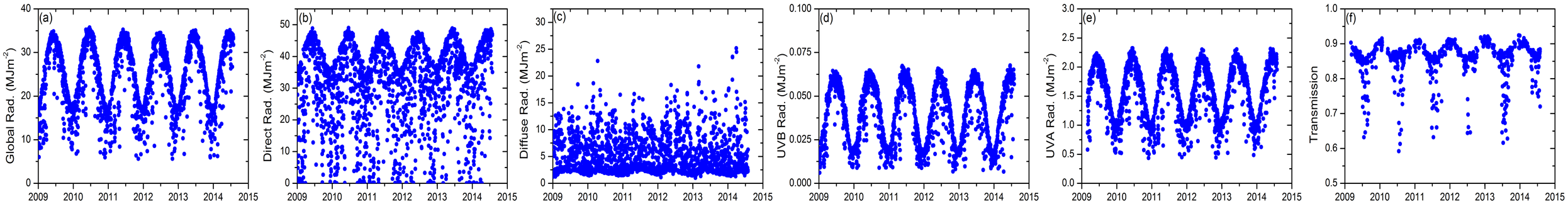


Figure 5.- Daily values (MJm $^{-2}$) of (a) global, (b) direct , (c) diffuse, (d) UVB, (e) UVA radiation, and (f) atmospheric transmission of direct solar radiation between January 2009 and July 2014 at IZA BSRN .

RECENT RESULTS

Solar irradiance measurements compared to simulations at the BSRN Izaña station. Mineral dust radiative forcing and efficiency study (García et al., 2014a)

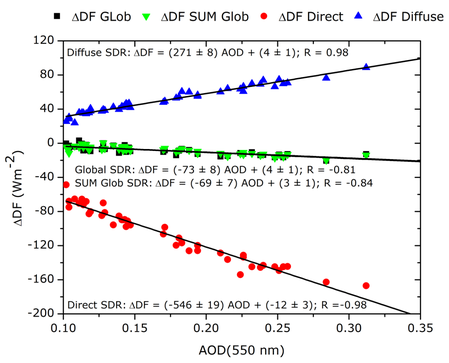


Figure 6.- Diurnally averaged aerosol radiative forcing (ΔDF) versus the daily AOD at 550 nm for global (black squares), SUM Glob (green squares), direct (red dots) and diffuse SDR (blue triangles) for all cloud-free days during March 2009 and August 2012 at BSRN IZA. The black solid lines are the linear regressions, where the slopes represent the diurnally average aerosol radiative forcing efficiency ($\Delta DF^{eff\text{-}slope}$)

Reconstruction of global solar radiation time series from 1933 to 2013 at Izaña Atmospheric Observatory (García et al., 2014b)

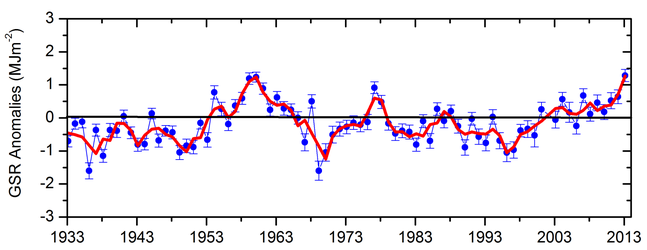


Figure 7.- Time series of the annual means of the GSR annomalies (MJm $^{-2}$) between 1933 and 2013 at IZA. The error bars indicate ±1 SEM (standard error of the mean) and five-yr moving average is shown in red.

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ONGOING AND NEXT RESEARCH

Figure 8.- Bimetallic pyranometer and Campbell-Stokes Installed at IZA .

1. **Aerosol Optical Depth reconstruction from neural network modeling using global radiation, relative humidity, temperature, and FCS between 1933 and 2013 at IZA.**
2. **One-year comparison of different old and new radiation (bimetallic pyranometer, CM-5, CM-11, CM-21) and sunshine (Campbell-Stokes, Sensor…and derived from Direct radiation) instruments (see Figure 8).**
3. **Radiative forcing and efficiency of desert dust coated with anthropogenic and natural pollutants (SO4=, NO3-, NH4+,…)**
4. **Scientific analysis of the long-term global radiation series (1993-2014) using sun-spots series, cloudiness, volcanoes records, aerosols and climate indexes.**
5. **Precipitable water vapor (PWV) obtained from relative humidity using a neural network, and validation/comparison against PWV from FTIR, GPS, radiosonde and CIMEL, NCEP (1948-2014) and ECMWF ERA Interim reanalysis (1979-2014).**

REFERENCE

García, R.D., O.E, García, E. Cuevas, V.E. Cachorro, P.M. Romero-Campos, R. Ramos and A.M. de Frutos, Solar radiation measurements compared to simulations at the BSRN Izaña station. Mineral dust radiative forcing and efficiency study, JGR-Atmospheres, Vol 119, 1-16, DOI: 10.1002/2013JD020301, 2014a

García, R.D., Cuevas, E., García, O.E., Cachorro, V., Pallé, P., Bustos, J.J., Romero-Campos, P., and de Frutos, A.M. : Reconstruction of global solar radiation time series from 1933 to 2013 at the Izaña Atmospheric Observatory,, **Atmos. Meas. Tech. Disccuss. 7, 4191-4227**, doi:10.5194/amtd-7-4191-2014,2014.

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