File Revision Date:
March 24, 2003

Data Set Description:

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| PI: | De la Casiniere Alain |
| Instrument: | UV spectroradiometer (Bentham DM 150) |
| Site: | Briancon (Villard St. Pancrace), France (44.90N, 6.65E, 1310m) |

Measurement Quantities:
Spectral irradiance on a horizontal surface (cosine weighted) of UV 291-400 nm at 0.5 nm step, resolution: 0.8 nm. Global and diffuse scans are taken at intervals of 0.5 hours when the sun elevation exceeds 11 degrees and the hour angle lies between -90 and 90 degrees (a shadow disk is used to measure the diffuse irradiance).

The data summaries on the NDSC database include the following:
1. 291-400 integral
2. UVA, 315-400 nm integral
3. UVB, 291-315 nm integral
4. Erythemal UV

Contact Information:


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Reference Articles:
Refereed journals.

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Lenoble, J., 2000: Influence of environment reflectance on UV zenith radiance for cloudless sky. Appl. Optics, 39, 4247-4254.

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Van Weele, M., T.J. Martin, M. Blumthaler, C. Brogniez, P.N. den Outer, O. Engelsen, J. Lenoble, B. Mayer, G. Pfister, A. Ruggaber, , B. Walravens, P. Weihs, B.G. Gardiner, D. Gillotay, D. Haferl, A. Kylling, G.Seckmeyer, W.M.F. Wauben, 2000: From model intercomparison towards benchmark UV spectra for six real atmospheric cases. J.Geophys. Res., 105, 4915-4926.

Bais, A. F.,B. G. Gardiner, H. Slaper, M. Blumthaler, G. Bernhard, R. McKenzie, A. R. Webb, G. Seckmeyer, B. Kjeldstad, T. Koskela, P. Kirsch, J. Gröbner, J. B. Kerr, S. Kazadzis, K. Leszczynski, D. Wardle, C. Brogniez, W. Josefsson, D. Gillotay, H. Reinen, P. Weihs, T. Svenoe, P. Eriksen, F. Kuik, A. Redondas : The SUSPEN intercomparison of ultraviolet spectroradiometers. J. Geophys. Res.(accepted).

Gröbner, J., A. Albold, M. Blumthaler, T. Cabot, A. de la Casinière, J. Lenoble, T. Martin, D. Masserot, M. Müller, T. Pichler, E. Pougatch, R. Philipona, G. Rengarajan, D. Schmucki, G. Seckmeyer, C. Sergent, M.L. Touré, P. Weihs, 2000: The variability of spectral solar ultraviolet irradiance in an Alpine environment. J. Geophys. Res., 105, 26991-27003.

de La Casinière, A., T. Cabot, M. L. Touré, D. Masserot, J. Lenoble, 2001: Method for correcting the wavelength misalignment in measured ultraviolet spectra. Applied Optics/vol.40, N°33/20 November 2001, 6130-6135.

Other journals.
Lenoble, J., C. Sergent, 2000: Etude du rayonnement ultraviolet dans les Alpes. Neige et Avalanches, N° 90, Juin 2000, 20-23.

Masserot, D., J.L. Bocquet, J. Lenoble, C. Brogniez, M. Barnéoud-Rousset, 2000: Résultats d'une campagne hivernale de mesures du rayonnement ultraviolet (UV) en milieu alpin (Briançon-février 1998). Nouvelles dermatologiques, 19, 445-450.

Proceedings.
Bocquet, J. L., E. Pachart, C. Brogniez, J. Lenoble, D. Gillotay, D. Bolsée, 1997: Measurements of UV-B spectral irradiance. Beginning of a regional network. IRS'96 : Current Problems in Atmospheric Radiation, W.L. Smith and K. Stamnes, Edits., A. Deepak Publishing, 888-891.

Pachart, E., J. Lenoble, C. Brogniez, J. L. Bocquet, P. Wang, 1997: Modelling of UV-B irradiance. Complementarity with measurements. IRS'96: Current Problems in Atmospheric Radiation, W.L. Smith and K. Stamnes, Edits., A. Deepak Publishing, 855-858.

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Weihs, P., S. Simic, G. Rengarajan, T. Martin, G. Seckmeyer, D. Schmucki, R. Philipona, C. Sergent, M. Blumthaler, J. Gröbner, A. de la Casinière, T. Cabot, J. Lenoble, D. Masserot: Modelling the effect of an

inhomogeneous surface albedo on incident UV in mountainous terrain; determination of an effective surface albedo. Proceedings IRS'2000, St. Petersburg, July 2000, to appear.

Thesis.
Wang, P., 1995: Modélisation et mesure du rayonnement solaire ultraviolet. Thèse Universté des Sciences et Technologies de Lille, France, No 1484.

Pachart, E., 1997: Mesures et modélisation du rayonnement ultraviolet au sol. Thèse Université des Sciences et Technologies de Lille, France, No 2148.

Instruments Description:
Data are cosine corrected:
Polynomial cosine correction functions depending on SZA have been developped, each one of them is specific for a particular wavelength interval and is used to correct direct irradiance (obtained by difference between global and diffuse measured signals).
Diffuse irradiance is also corrected assuming an isotropic sky luminance.
Corrected Global irradiance is the sum of corrected direct and diffuse irradiances.

Wavelength error is corrected with a program developed in our laboratory (see de La Casinière et al., 2001). Residual shift generally does not exceed 0.05 nm, except for wavelengths lower than 295 nm.

Sampling step is 0.5 nm somewhat larger than 0.5xFWHM (0.4 nm).

Slit function:
specification of 10-3 at 2.5 FWHM is reached.
specification of 10-5 at 6 FWHM not achieve.

Absolute calibration uncertainties lower than 10%.

Algorithm Description:
Acquisition program written in Turbo Pascal.
Possibility to change site, range, or instrument parameters in the menu.
Idem for programming measurement periods and periodicity of scans (global/diffuse/global series).
Dark noise and straylight during measurement are removed.
Direct, diffuse and global spectra are calculated, converting measured signals into irradiances.
Intensity calibration:
Uses calibrations made with 1000W FEL lamps to form files of calibration factors at each wavelength.
Wavelength calibration:
Tested and adjusted with Hg lamp spectrum.
Wavelength shift calculated and corrected with a program developed in our laboratory (see de La Casinière et al., 2001).

Instrument History:

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| Mar 1999 | First measurements during CUVRA campaign (Garmisch-PartenKirschen, Germany). |
| Oct 1999 | Measurements at Briançon began. |
| Jan 2000 | Detection failure followed by repairs and improvements (two High voltage zones instead of one). |
| Sep 2000 | Measurements at Briançon restart. |
| Nov 2002 | Stop for servicing and minor improvements. |
| Dec 2002 | Measurements at Briançon restart. |

The data processing algorithm has undergone many revisions, which will continue.