

Measurements of solar UV irradiance at Jungfrauoch, 3580 m above sea level, Switzerland, in 2000

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Within a long-term project since 1980 variability and trend of solar UV irradiance have been observed at the High Alpine Research Station Jungfrauoch as a consequence of short- and long-term variations of atmospheric ozone and of the other atmospheric parameters. Annual campaigns of about 8 weeks duration have been carried out in a way, so that the whole seasonal course is covered after a few years. The long-term variation of the biologically significant erythemally weighted UV-irradiance, which can be taken as an indicator of harmful reactions on humans, is of special interest.

Besides broadband UVB- and UVA-detectors and a pyranometer, a double-monochromator spectroradiometer is in use, which allows spectral measurements of global and direct irradiance between 280 nm and 500 nm with a resolution of 0.5 nm. Total ozone column and spectral extinction by aerosols is derived from spectral measurements of direct sun irradiance and from ancillary sunphotometric measurements. The necessary high quality of the UV measurements is achieved by close international cooperation.

In 2000, the field campaign at Jungfrauoch took place between 14.04.2000 and 25.05.2000. During the whole period at least one scientific collaborator from the Institute for Medical Physics was taking care of the measurements for continuous quality control and for additional manual ancillary measurements. Unfortunately, this year the measurements suffered somehow from the prevailing bad weather conditions, especially in April. However, finally a good collection of significant data could be accumulated. First analyses of these data with respect to total ozone and aerosol optical depth are already carried out, further ones concerning the effect of changing albedo and concerning the long-term variations are in preparation. The measurements on the few clear days were also used for calibration of direct sun measurements with the spectroradiometer and with handheld sunphotometers applying the Langley-technique.

Results from measurements in the previous years were presented at the 2nd General Assembly of the WRC-Project SPARC in Argentina (November 6.-10.2000) with an oral presentation entitled 'Effect of varying albedo on solar UV irradiance'.

It is intended to continue the measurement campaigns at Jungfrauoch in the following years, as it will be of special interest, if a tendency for recovering of the ozone layer will really occur, which should be accompanied by decreasing levels of UV-B irradiance. Such conclusions can be drawn only from measurements carried out over several years, because otherwise the strong natural short-term variations of the atmospheric parameters may mask any long-term trend.

