



Characterisation of the effects of clouds on radiation

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An important question currently challenging climatologists is: what will be the effect of potential changes in the amount or type of clouds brought by climate changes on the radiation energy partition. Detailed information about the effects of each type of cloud on the solar (global) and long-wave radiation is necessary for answering such a question. This presentation describes a project aimed at addressing such needs by characterizing the effects of clouds on radiation observations using a classification of cloud situation.

Data from the MeteoSwiss Payerne (Switzerland) station of the Baseline Surface Radiation Network are used for this project. These include continuous and highly accurate measurements of the short- and longwave radiation fluxes. Besides those measurements synoptical weather information is available every three hours. The cloud effect is determined by comparing radiation measurements in cloudy situations to estimates of corresponding clear sky radiation. The latter are obtained using the Short Wave Flux Analysis algorithm by Ch. N. Long (2000). In a first step, cloud types are categorised based on synoptic observations. Then we analyse the differences between measured cloudy and estimated clear sky irradiance as function of cloud type and cloud amount.

Reference:

Long, C. N. and T. P. Ackerman, (2000): Identification of Clear Skies from Broadband Pyranometer Measurements and Calculation of Downwelling Shortwave Cloud Effects, JGR, 105, No. D12, 15609-15626.