



Development of a gridded surface solar radiation dataset from the Global Energy Balance Archive

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The need for a gridded solar radiation dataset from surface observations is important for the study of long-term changes in the surface shortwave downward component of the radiation budget as well as for the assessment of modeled and satellite derived data of this radiative parameter. This will be accomplished by applying spatial statistical techniques, such as kriging and inverse distance to interpolate irregularly distributed solar radiation station data over Europe from the Global Energy Balance Archive (GEBA) onto regular grids of different spatial resolutions. The GEBA database is currently maintained at the Institute for Atmospheric and Climate Science ETH in Zurich, Switzerland and has been updated to 2007. Quality controlled procedures have been applied to this dataset with a measurement random error of about 5% for the monthly mean. In order to reduce additional biases introduced from a lack of stations within a particular region, we combine it with other gridded datasets, such as those derived from reanalysis and satellite remote sensing. To evaluate the interpolated gridded dataset, we validate it separately for each interpolation method by comparing co-located boxes to the original station data from GEBA as well as to the Baseline Surface Radiation Network (BSRN). From this validation the usefulness of this gridded dataset will be assessed as well as its applicability for climate research.