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Correction and homogenization of BSRN radiation records using updated calibrations from the World Standard Group of short- and longwave radiometers

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The objective of our study is to correct and homogenize the ground-based radiation records of the Baseline Surface Radiation Network (BSRN). The unique BSRN archive holds the world's most accurate radiation data which are used by research communities around the globe to validate satellite products and climate model outputs. Recent measurements with newly developed high precision ground-based radiometers have demonstrated, however, that corrections by up to 5 Wm-2 of the World Standard Groups of short- and long-wave radiation hosted by the World Radiation Center in Davos are required. Since most of the BSRN data are traceable to these reference groups, the BSRN data will also need to be corrected and re-calculated. Such a correction is undoubtedly a sensitive and difficult issue, and requires a thorough re-analysis of raw data from BSRN and the World Standard Groups using ancillary information on the current state of the atmosphere.

The foreseen modifications to the short- and long-wave WSGs have profound implications on all networks including the BSRN archive and therefore on satellite-based surface fluxes, climate models and global surface radiation budget studies. The commission for instruments and methods of observations (CIMO) proposed that Task Teams should be established: 1) to assess the consequences of a change in solar/terrestrial reference scales with regard to BSRN, 2) to make recommendations for a modification of the current references, and 3) to propose methods on how to deal with old BSRN data.

In this study we will give an overview of the above-mentioned tasks to be performed in the next several years and current progress.