Geophysical Research Abstracts, Vol. 7, 08016, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08016

Simultaneous observations of surface solar radiation variability from space and ground

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A key forcing function that determines surface temperature and climate is solar radiation. Global trends in this parameter are difficult to establish from ground observations due to instrument quality, small number of observing stations, and instrument maintenance and calibration issues. Most available estimates of large or global scale distributions of radiative fluxes come from synthesis of ground observations and from model estimates. At present, several efforts are underway to use satellite observations to estimate radiative fluxes both at the surface and at the top of the atmosphere. In addition to the methodology used to infer such fluxes, the accuracy of the derived values depends on the quality of the satellite data, instrument calibration, the spatial and temporal resolution of the satellite observations that enter the computations, and the spatial and temporal resolution to which these estimates are amalgamated. In this presentation, an attempt will be made to present large and global scale statistics of radiative fluxes derived with an inference scheme developed at the University of Maryland as driven with about twenty years of satellite observations from the NOAA/NASA Pathfinder ISCCP data at 2.5 degree spatial resolution at 3 hourly time resolution and optimally interpolated, using an EOF approach. The record will be analyzed for tendencies and ability to detect climatic signals within the twenty-year period. Ground observations of highest quality like those resulting from the BSRN activities will be used to evaluate to what extend the satellite and ground observations are consistent in detecting variability.