

The assessment and use of 1-Degree Gridded TOA and surface radiative flux products from CERES FLASHFlux for science and applications

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Abstract:

Achieving the exceptional quality of the Clouds and the Earth's Radiant Energy Systems (CERES) data products requires a considerable level of processing. Obtaining such high quality, however, causes delays in the release of CERES data that are typically greater than six months beyond the acquisition of the initial measurements. There are, however, a significant number of near real-time uses for the CERES data 1-Degree gridded products. Thus, the Fast Longwave and Shortwave Radiative Flux (FLASHFlux) project was created and now provides CERES-like gridded data products to the data analysis community within a week of the initial measurements by exchanging some degree of accuracy for speed. Now with regular CERES products becoming available for substantial periods, overlap between regular CERES products and CERES FLASHFlux products provides an opportunity for the assessment of both TOA (Top-of-Atmosphere) and surface FLASHFlux products. Gridded FLASHFlux surface fluxes are also shown to compare remarkably well to surface-based measurements. Using these comparisons, an overview of the flux uncertainty is provided for the CERES FLASHFlux products. Additionally, we identify through examples and analysis, the use of these data to a) evaluate global and regional variability, and b) adapt and provide data for applied science uses such as electric utilities, building energy monitoring and targeting, and in seasonal irradiances for crop modeling.

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