Evaluating Surface Flux Results from FLASHFlux Version 3A
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Introduction:
The Fast Longwave and Shortwave Radiative Flux (FLASHFlux) data product was developed to provide a rapid release version of the Clouds and Earth's Radiant Energy System (CERES) results, which could be made available to the research and applications communities within one week of the satellite observations by exchanging some accuracy for speed of processing. Unlike standard CERES products, FLASHFlux does not maintain a long-term consistent dataset. Therefore the latest changes in algorithms and input data can be incorporated into processing. FLASHFlux transitioned from Version 2H to Version 3A in January 2013 changing to the latest meteorological product from Global Modeling and Assimilation Office (GMAO), GEOS-FP-IT (5.9.1), latest spectral response functions and gains for the CERES instruments, and aerosol climatology based on the latest MATCH data. Some algorithm changes were made in the cloud transmission coefficient and Rayleigh attenuation for the shortwave flux computation. Typically FLASHFlux does not reprocess when a new version is released. However, in order to investigate the effects of the changes in algorithms and input data, nine months (201207 – 201303) were processed with both Version2H and Version3A. The Time Interpolated Space Averaged (TISA) surface flux results from these overlap months have been compared to the ground-based measurements. The effects of the changes on the calculated surface fluxes were evaluated.

Conclusion:
Shortwave: Replacing the WCP-55 aerosol properties in the SW algorithm with monthly climatological properties based on 10-year monthly averages of MODIS aerosol optical depths made considerable difference in the resulting fluxes. Though the comparison with the ground measurements shows little improvement, the use of the more up-to-date optical depths correspond to an improvement in the ground measured/FLASHFlux difference histograms shown above. Further improvement in the SW model, it is planned to use near real time aerosol in place of the climatology. Also, work continues on the cloud transmission algorithm.

Longwave: The use of the new GEOS 5.9.1 meteorology with changes in the lower atmospheric temperature, humidity and skin temperature made the largest difference in the surface LW results. FLASHFlux LW fluxes overall showed a slightly larger bias but a slightly improved RMSE. The most improved surface types were the the Island and Desert sites.

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