Geophysical Research Abstracts
Vol. 12, EGU2010-9989, 2010
EGU General Assembly 2010

Assessing the Monthly Averaged Variability of TOA Fluxes from CERES using EBAF, ERBE-like and FLASHFlux Data From 2001 to Present

Paul Stackhouse (1), Takmeng Wong (1), David Kratz (1), Shashi Gupta (2), Anne Wiber (2), and Anne Edwards (2)

(1) NASA Langley Research Center, Atmospheric Science/Climate Sciences Branch, Hampton, VA, United States (paul.w.stackhouse@nasa.gov), (2) Science Systems and Applications, Inc, Hampton, VA, USA

The FLASHFlux (Fast Longwave and Shortwave radiative Fluxes from CERES and MODIS) project derives daily averaged gridded top-of-atmosphere (TOA) and surface radiative fluxes within one week of observation. Production of CERES based TOA and surface fluxes is achieved by using the latest CERES calibration that is assumed constant in time and by making simplifying assumptions in the computation of time and space averaged quantities. Together these assumptions result in approximately a 1% increase in the uncertainty for FLASHFlux products over CERES. Analysis has clearly demonstrated that the global-annual mean outgoing longwave radiation shows a decrease of $\sim$0.75 Wm-2, from 2007 to 2008, while the global-annual mean reflected shortwave radiation shows a decrease of 0.14 Wm-2 over that same period. Thus, the combined longwave and shortwave changes have resulted in an increase of $\sim$0.89 Wm-2 in net radiation into the Earth climate system in 2008. A time series of TOA fluxes was constructed from CERES EBAF, CERES ERBE-like and FLASHFLUX. Relative to this multi-dataset average from 2001 to 2008, the 2008 global-annual mean anomalies are -0.54/-0.26/+0.80 Wm-2, respectively, for the longwave/shortwave/net radiation. These flux values, which were published in the NOAA 2008 State of the Climate Report, are within their corresponding 2-sigma interannual variabilities for this period.

This paper extends these results through 2009, where the net flux is observed to recover. The TOA LW variability is also compared to AIRS OLR showing excellent agreement in the anomalies. The variability appears very well correlated to the to the 2007-2009 La Nina/El Nino cycles, which altered the global distribution of clouds, total column water vapor and temperature. Reassessments of these results are expected when newer Clouds and the Earth's Radiant Energy System (CERES) data are released.