**Introduction**

- Top-of-atmosphere (TOA) broadband (BB) longwave (LW) and shortwave (SW) fluxes essential for evaluating climate change & cloud-radiative interactions
- Current satellites measure the nonpolar Earth Radiation Budget (ERB) only at specific local times, providing a diurnally limited ERB. Must expand ERB measurements to cover the diurnal cycle and provide higher spatial resolution than traditional ERB data.
- NASA/Langley Cloud group routinely derives cloud & ERB data from polar-orbiting satellites (e.g. NOAA-xx series) to fill in GEO gaps

**Objective**

- Develop & assess fits for GEO (MTSAT-2) based on CERES over TWP, and preliminary fits for NOAA-9 based on ERBE for global coverage including hard-to-observe areas like Gan Island, NSA

**Approach**

- GEO: Match 1° average MTSAT2 data to CERES SFC: 0.175°, 121-140°E
- MTSAT-2 vs Terra CERES: Jan-Mar 2012 (Wet Season) and May-Oct 2011 (Dry Season)
- Compare results of both fits using 2011-2013 CERES Terra data
- POLAR: Match collocated AVHRR data with ERBE SSF footprints: global
- Compare results of monthly fits applied to Oct 2008 NOAA-9 AVHRR to CERES Aqua

**Data & Methodology**

- BB fit 2011-2012 CERES & MTSAT-2 1° data within 5° of a vs CERES Terra NB-BB fits, accounting for season (SW & LW) & day/night (LW) randomly using convolved goes vs BB fluxes over ARM SGP.
- Validate with CERES results: May-Oct 2011 MTSAT-2 vs Terra

**Validation with CERES**

- May-Oct 2011 MTSAT-2 vs Terra
- Fig. 2 MTSAT-2-derived BB albedo and LW flux over the Tropical Western Pacific region for 0032 UTC on February 1, 2012.

**Independent Assessment: POLAR Oct16 fits vs Terra**

- Table 1. Shows independent assessments of SW and LW biases/rms for fluxes derived using Wet Season fits applied to March 2013, and Dry Season fit applied to (May-July 2012) compared to CERES Ed3 Terra and Aqua.

**Summary**

- Produced NB-BB fits for both GEO (MTSAT-2) and POLAR (NOAA9) satellites to derive BB LW & SW TOA fluxes for various ARM domains
- Accounted for seasonal, day-night, land-ocean (and snow for NOAA9) differences
- POLAR MTSAT-2 VISST results/TOA fluxes for Jan-November 2013; most months currently in ARM archive; will be sent soon
- Future work:
  - Validate NOAA-18 AVHRR-derived BB albedo and LW flux over the region including Gan Island in the Indian Ocean, for +7 UTC on October 18, 2008.

**Website:** (http://www-pm.larc.nasa.gov)