5th GOES Users Conference:

P1.12 Validation of a GOES-R Broadband Shortwave Surface Transmission and TOA Albedo Look-Up-Table method.

Fred G. Rose, Istvan Laszlo, Thomas P. Charlock, Qiang Fu

Method: Fu-Liou GOesR Look-Up-Table (FLUGOR LUT)

- The Langley Fu-Liou SW code an 18 band 2-stream correlated-k delta-eddington code was run using 35 vertical levels to generate two Look-Up-Talbles (LUT). One clear-sky (7 variables) another for cloudy-sky (8 variables) together they form a pseudo 11 variable LUT. Outputs are TOA broadband albedo and broadband surface transmission. In this validation test LUT inputs are the same as the Full RT CRS Ed2b product.

FLUGOR LUT Inputs:

f { solar zenith angle, PW, O_3,
Surface [albedo, elevation],
Cloud [fraction, optical depth, R_e or D_e, height],
Aerosol [tau, ssa] }

FLUGOR LUT Output:

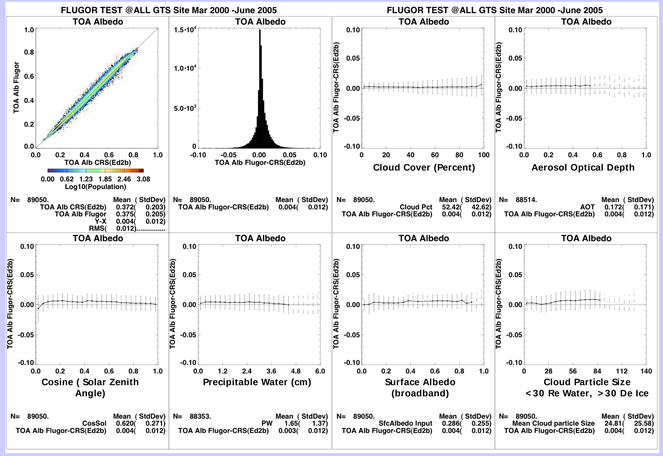
BROADBAND SURFACE TRANSMISSION
BROADBAND TOA ALBEDO

Validation Comparisons:

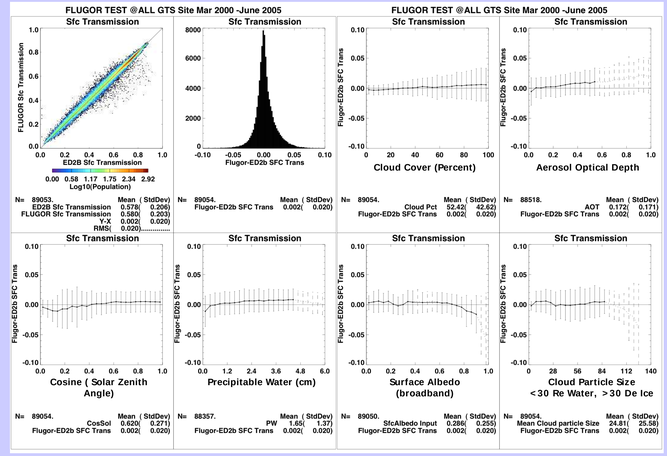
- Five years of instantaneous daily daytime CERES overpass data at 45 sites
- Full Fu-Liou radiative transfer code results from CERES CRS Ed2b product using CERES observed fluxes, MODIS based cloud and aerosols. Comparisons at TOA and Surface
- Surface data at 45 sites from ARM, BSRN, CMDL, SURFRAD processed in to 15 minute averages taken from CERES/CAVE (Ceres Arm Validation Experiment) website.

FLUGOR LUT compared to Full CERES Radiative Transfer CRS Ed2b Product

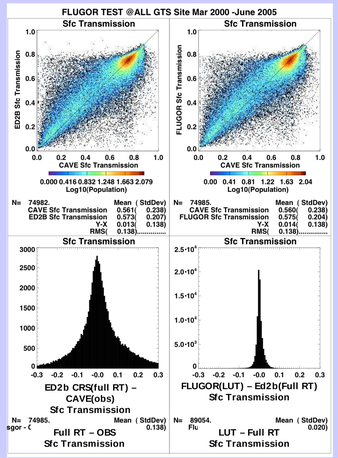
TOA Broadband ALBEDO



Surface SW BB Transmission



Instantaneous Observation of Surface Transmission



FLUGOR LUT surface transmission scatter, means and standard deviation are very similar to FULL CRS Ed2b radiative transfer results.

Standard deviations of instantaneous comparison of FULL RT to Surface Observations dwarf the FLUGOR LUT minus FULL CRS Ed2b Radiative transfer instantaneous differences.

FLUGOR LUT Vs. Surface Based Observations of Surface BB Transmission