Custom Data Support for the FAst-physics System TEstbed & Research (FASTER) Project

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What is FASTER?

The multi-institutional project aims to evaluate and improve parameterizations of fast processes (those involving clouds, precipitation, and aerosols) in global climate models, using a combination of numerical prediction models, single-column models, cloud-resolving models, large-eddy simulations, full global climate model output, ARM active and passive remote sensing and in situ data.

Summary

- The FASTER Data Support effort provides best estimate (CMBE-like) products *customized* to the needs of FASTER GCM, CRM and LES modelers.
- Select products will be made available to the ARM community.

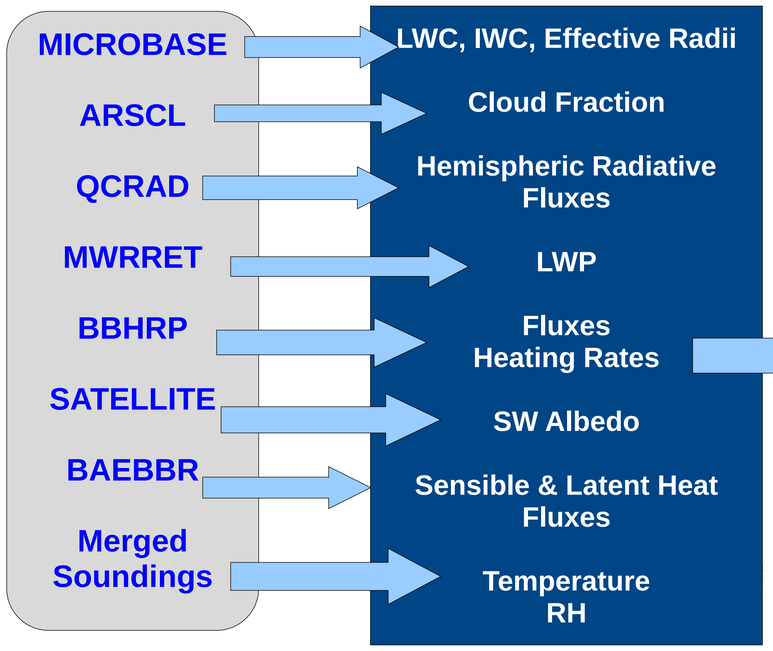
Data Product Development

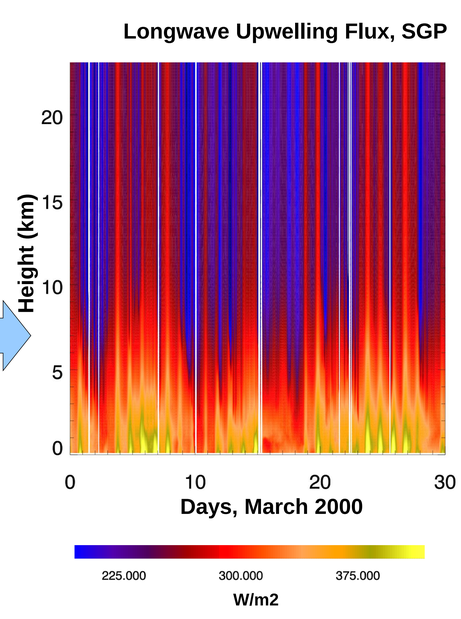
The custom data support effort specializes in the formulation of best estimate (CMBE-like) datasets tailored to GCM, CRM and LES modelers. Products include *custom gridding and averaging* for the model of interest, using high time resolution and pixel-level data from continuous ARM observations and complementary data sets.

Currently, we have produced three products, as shown below, for the SGP March 2000 IOP as part of FASTER's warm-up exercises.

1. Cloud Model Product

Produced averages, statistics and QC for 1 hour and 5 minute resolutions.

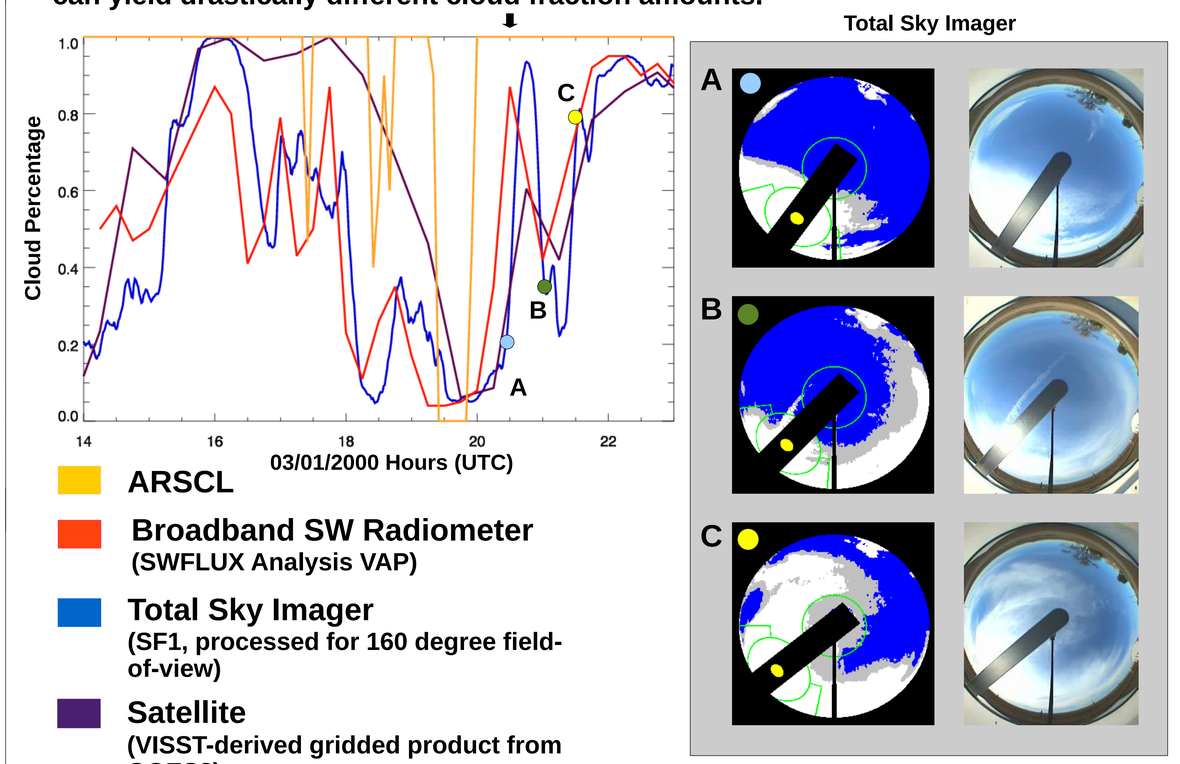




Research Activity: Cloud Fraction

Objective is an optimized cloud fraction product for model evaluation.

Inhomogeneity in cloud cover, as interpreted by different instruments/products, can yield drastically different cloud fraction amounts.

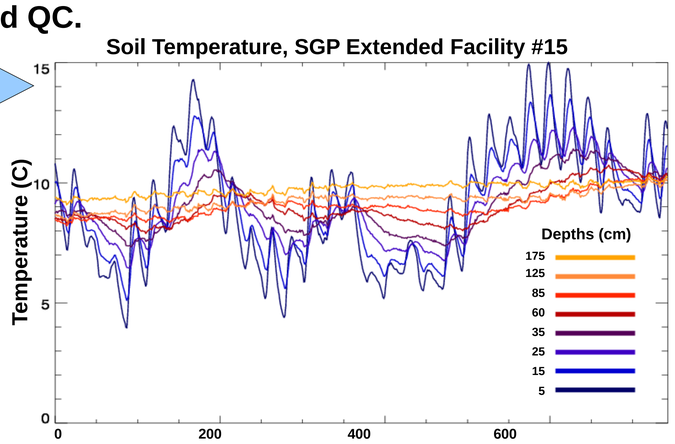


2. Soil Moisture & Temperature Profiling Product

Produced individual facility and SGP domain-wide hourly averages, statistics and QC.

SWATS

Source: The Soil Water and Temperature Profiling System (SWATS) provides hourly measurements from individual facilities at SGP.

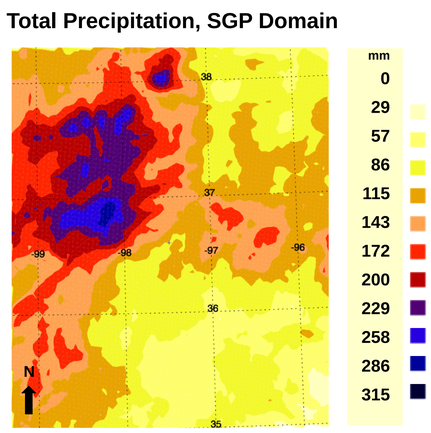


3. Gridded Precipitation Product

Produced SGP domain-wide hourly averages, statistics and QC.

ABRFC

Source: Arkansas-Red Basin River Forecast Center (ABRFC) 4km x 4km hourly estimated precipitation product.



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References:

Xie, et. al. 2010: ARM Climate Modeling Best Estimate Data: A New Data Product for Climate Studies. *American Meteorological Society*, 13-20.

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