LSWG Topics - 7 May 2014

GPROF retrievals are available for early adopters, current version is v1.2 (as of a few weeks ago). About two months of data so far; will save discussion on this until June or July telecall.

Status of sounder retrieval?

PMM meeting in August- will have a side meeting for land group, which has been suggested to not overlap with the radiometer & combined groups.

Suggest a consistent time for this telecall. First Wednesday of each month at 11AM Eastern time has been suggested. Does this work?

Have spoken to several of you and there are some very good presentations for the June and July telecalls

Anything else?

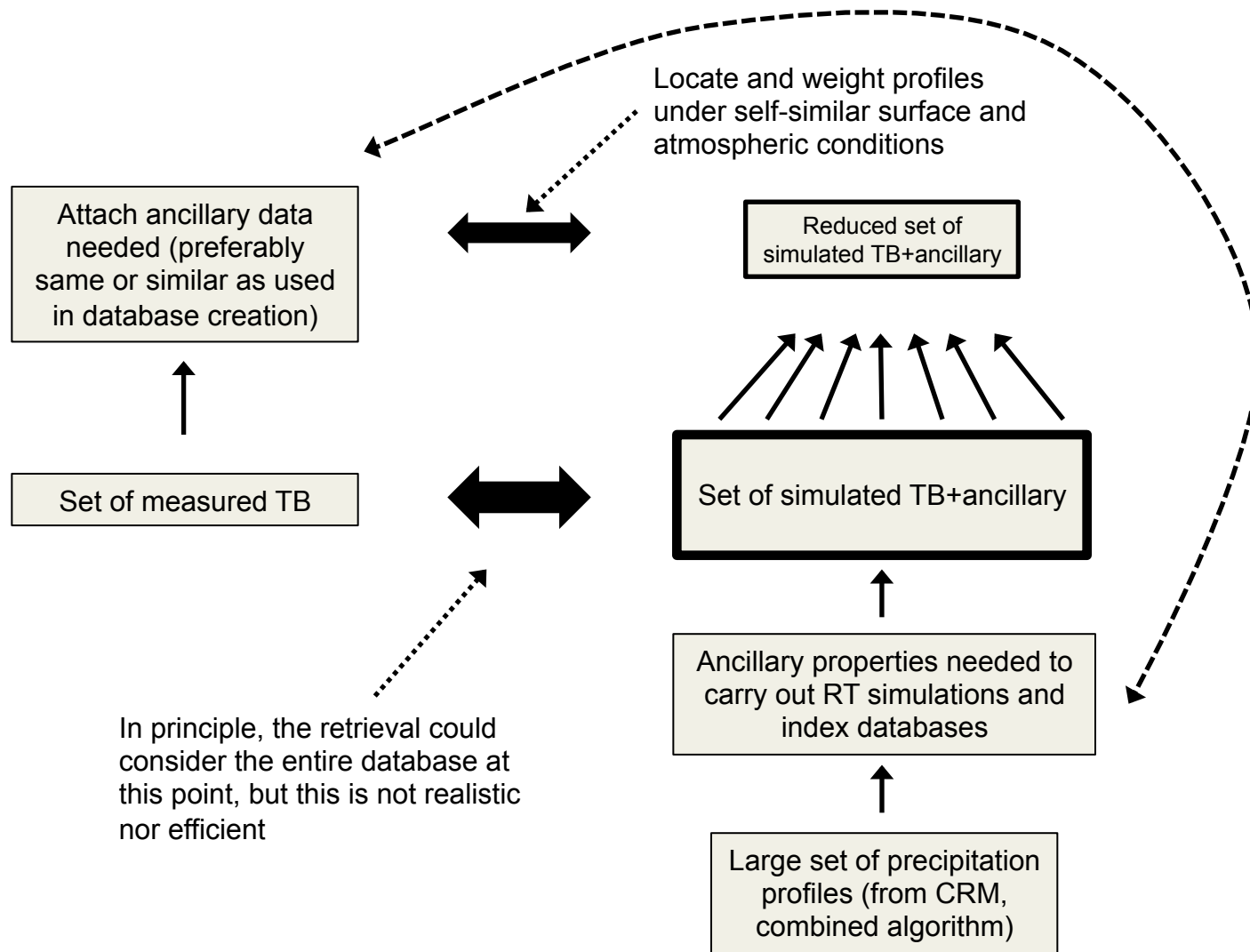# Testing of S1- and S2-based radiometer precipitation retrievals

LSWG participants have carried out significant PMM-relevant "land surface science" over the past 2-3 years (studies of physical properties and surface classification, and how these influence the multi-frequency land surface emissivity)

What is lacking so far is a framework for testing and evaluating the effect of land surface properties on the radiometer retrieval (Y. Tian's comments), comparison of S1 and S2 approaches, applicable to sounders as well as imagers

Based on recent discussions with several of you, some of this is already being examined or tested, but some ideas on next slides

Simplified view of retrieval structure

Challenge for over-land retrieval: Pick the right properties when the database is built. These same properties should be available at the time of the retrieval.

Locate and weight profiles under self-similar surface and atmospheric conditions

Attach ancillary data needed (preferably same or similar as used in database creation)

Reduced set of simulated TB+ancillary

Set of measured TB

Set of simulated TB+ancillary

In principle, the retrieval could consider the entire database at this point, but this is not realistic nor efficient

Ancillary properties needed to carry out RT simulations and index databases

Large set of precipitation profiles (from CRM, combined algorithm)

Offline profile database creation

To compare and evaluate S1 and S2 type retrievals offline, a properly designed and indexed database is needed

When the combined DPR+GMI retrieval is ready, it will be the source of the hydrometeor profiles (over the core sat orbital coverage)

Use recent re-runs of Goddard MMF-SDSU to build database and use it in a synthetic fashion (set aside part as "truth", the other part as "observations")

Last discussions that I had with Karen Mohr are from Dec 2013, so some of this has already been done or tested, but some ideas on next slides

An example physical database using MMF-SDSU

Subset of cloud-resolving model simulations. The CRM has its own internal land parameterizations and land parameters (not sure how much of this gets used by MMF-SDSU).

+

profile N

profile 1

height

water content
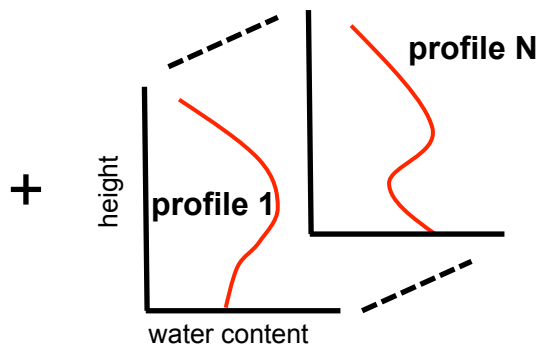
Whatever properties are used, they should be available at retrieval time. For the synthetic approach here, that means carrying these properties in the database

each profile

Do enough (?) RT runs so as to capture the joint variability between the condensed water profile and land state

S1: TELSEM. Co-vary emis vector about its mean using TELSEM-provided covariance

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Set of SDSU-simulated TB + surface classification

One subset of simulations as "observations" ⟷ Other subset of simulations as "database"

S1 retrieval

S2: Vary LSM-provided surface properties, e.g land sfc temp, VWC or proxy, soil moisture (?) others (?)

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Physical emissivity model that feeds off of land surface properties (e.g., CRTM, CMEM, other)

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Set of SDSU-simulated TB + land properties

One subset of simulations as "observations" ⟷ Other subset of simulations as "database"

S2 retrieval

NASA PMM Land Surface Working Group telecall, May 7, 2014