Data Assimilation Research Testbed Tutorial

Section 20: Model Parameter Estimation

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From ensemble filter perspective:

Just add any parameters of interest to the model state vector;

Possible difficulties:

1. Where are parameters ‘located’ for localization?
2. Parameters won’t have any error growth in time
   (unless we add some): could lear to filter divergence.
3. Parameters may not be strongly correlated with any observations.

Testing Parameter Estimation in DART:

DART includes models/forced_lorenz_96 directory.

Each state variable has corresponding forcing variable, F

Additional namelist control aspects required for experimentation:

1. reset_forcing = .true.,
   If true, F_i = *forcing* (also from namelist) for all i, t.
2. random_forcing_amplitude = 0.1
   σ_{noise} for F_i time tendency,
   not used if reset_forcing is true.

Using these, can create OSSE sets with fixed, global F value.

Assimilate these with filter.

Get an ensemble st33c ofr F

Contest: Given an observation set, what was the value of F?

In event of tie, random number generator will be used.