

Version 1.0: June, 2005

From ensemble filter perspective:

Just add any parameters of the model state vector;
Proceed to assimilate as before.

Possible difficulties:

1. Where are parameters 'located' for localization?
2. Parameters won't have any error growth over time

Testing Parameter Estimation in DART:

DART includes *models/forced_lorenz_96* directory.

Each state variable has corresponding forcing variable, F_i .

$$dX_i / dt = (X_{i+1} - X_{i-2})X_{i-1} - X_i + F_i \quad (3)$$

$$dF_i/dt = N(0, \sigma_{\text{noise}}) \quad (4)$$

Can observations of some function of state variables constrain F ?

Additional namelist control aspects required for experimentation:

1. *reset_forcing*,

If true, $F_i = \textit{forcing}$ (also from namelist) for all i , t .

2. *random_forcing_amplitude*

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, estimate state and forcing.

Get an ensemble sample of F_i at each time.

Assimilation in the forced Lorenz-96 model:

cd models/forced_lorenz_96/work.

Execute *cs* *workshop_setup.csh*.

Use matlab, etc. to examine output.

Same 40 randomly located observations as in *lorenz_96* cases.

Forcing was fixed at 8.0 in the *perfect_model* run.

Values of 67 T are *odeli36x*

