First analysis with MPAS/OOPS

- Analysis at 2016-03-04_06 (that of obs file)

- MPAS 480 km (nCells=2562), 6 vertical levels

- Analysis variable: theta, rho, qv, uReconstructZonal, uReconstructMeridional

- Obs: 915 radiosonde Tv (27 stations)

N_e=5 with different forecast lead time

- 3dvar with B=I & 3denvar with NICAS localization

- 2 outer loops, 10 inner loops for each OL

- DRIPCG minimizer (one of 15 algorithms)

- Linearization state for linearized variable transform is not yet prepared. Before that, the linearization state is directly read from a file.

3dvar (B=I)

Evaluation of J w/ first guess
Nonlinear Jb = 0
Nonlinear Jo = 6435.99
Nonlinear **J = 6435.99**

After 1st outerloop
Nonlinear Jb = 3.04619e-06
Nonlinear Jo = 1631.85
Nonlinear **J = 1631.85**

After 2nd outerloop
Nonlinear Jb = 4.99909e-06
Nonlinear Jo = 1201.33
Nonlinear **J = 1201.33**

3denvar (NICAS loc.)

Evaluation of J w/ first guess
Nonlinear Jb = 0
Nonlinear Jo = 6435.99
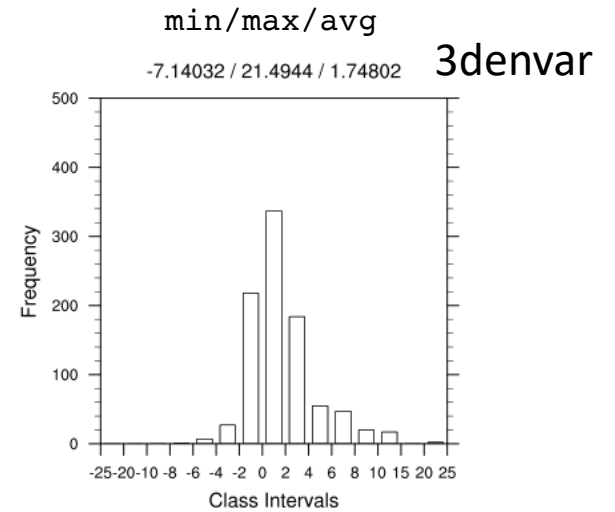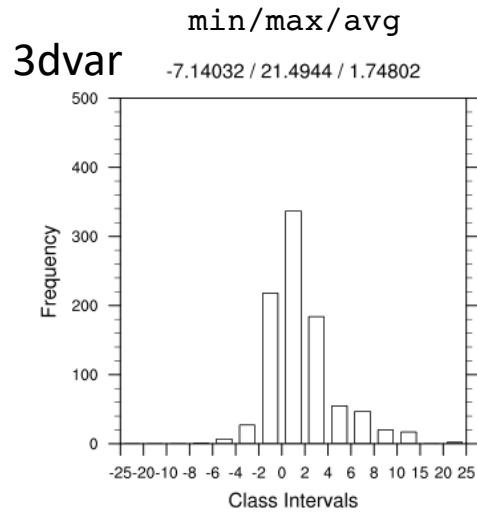Nonlinear **J = 6435.99**

After 1st outerloop
Nonlinear Jb = 0.00229451
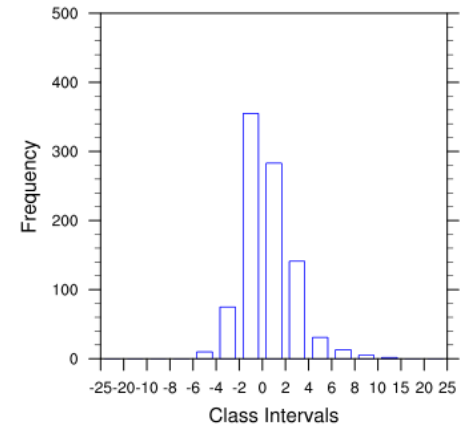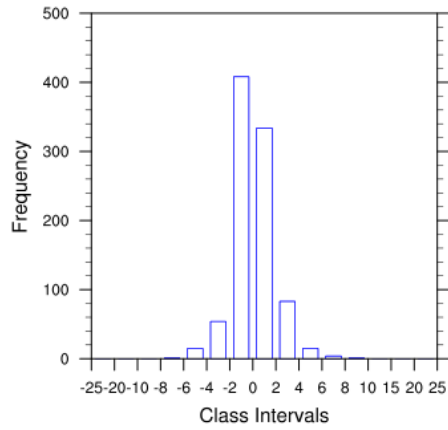Nonlinear Jo = 2735.9
Nonlinear **J = 2735.91**

After 2nd outerloop
Nonlinear Jb = 0.00218949
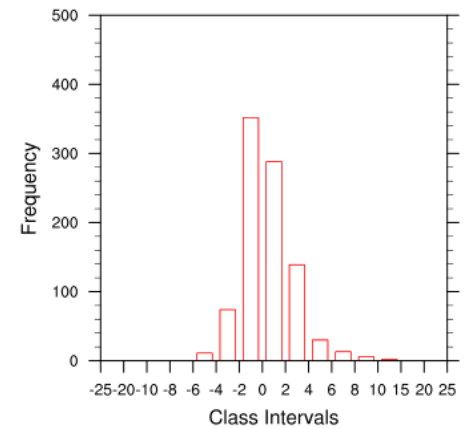Nonlinear Jo = 2718.88
Nonlinear **J = 2718.89**
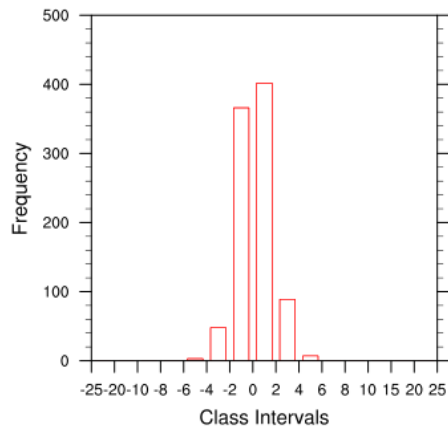
Fit-to-obs of first guess

3dvar

3denvar

min/max/avg
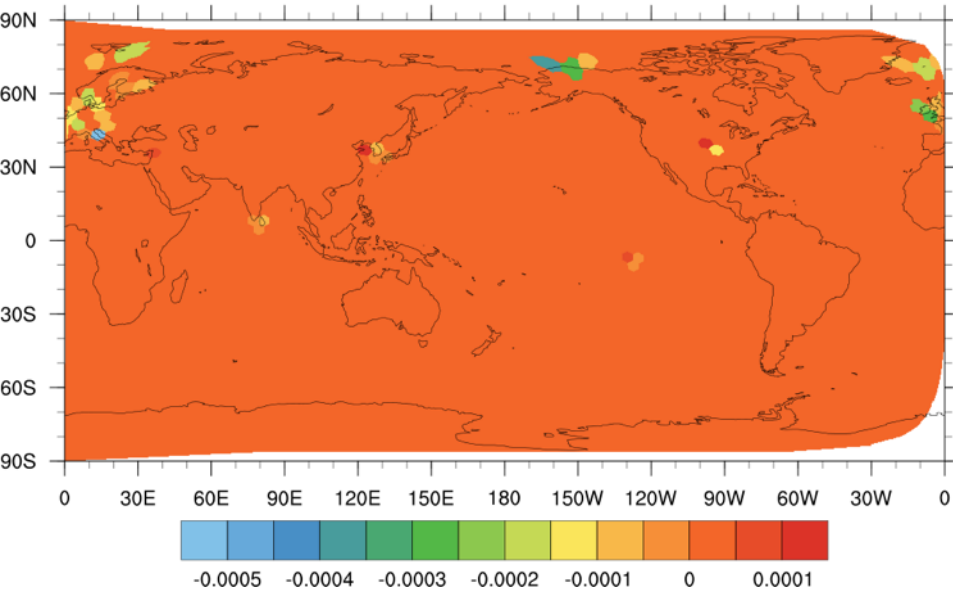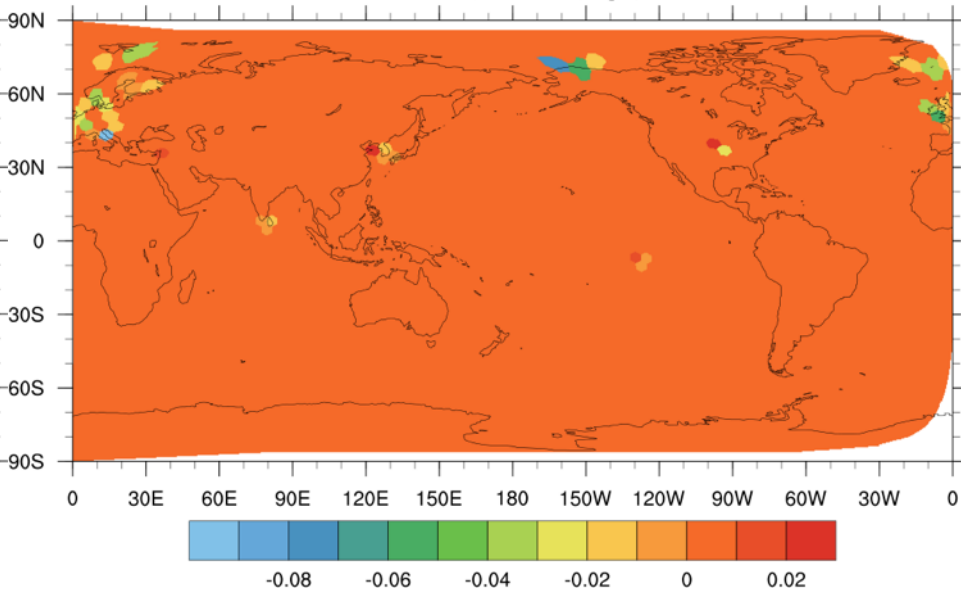
min/max/avg

After 1st OL

After 2nd OL

- Obs write is **not** hooked w/ IODA (ncdiag routines)
- This is direct print out in Fortran code.

(total) analysis increment for 3dvar (B=I): increments only for theta & qv (obs var = Tv)
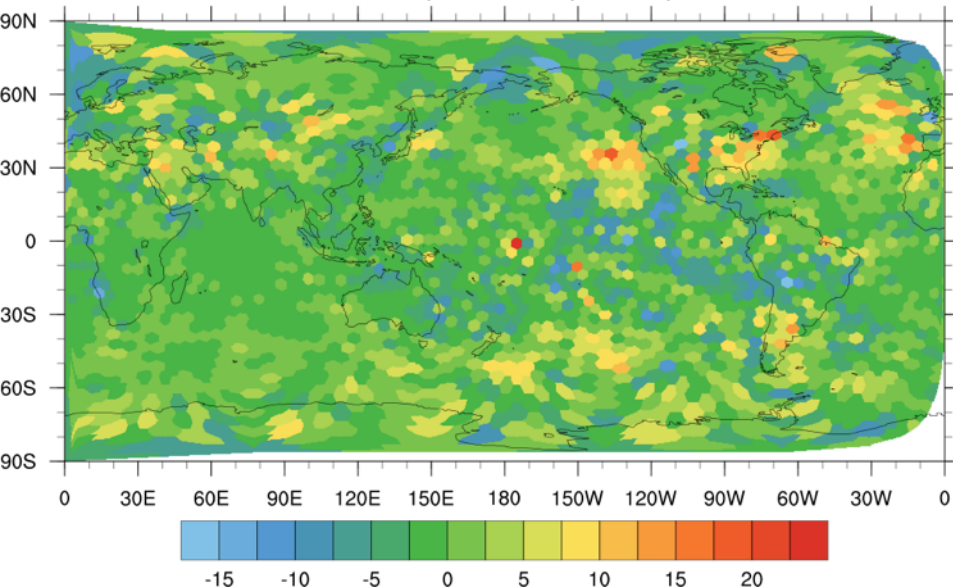

Increment, 3dvar, theta, k=3
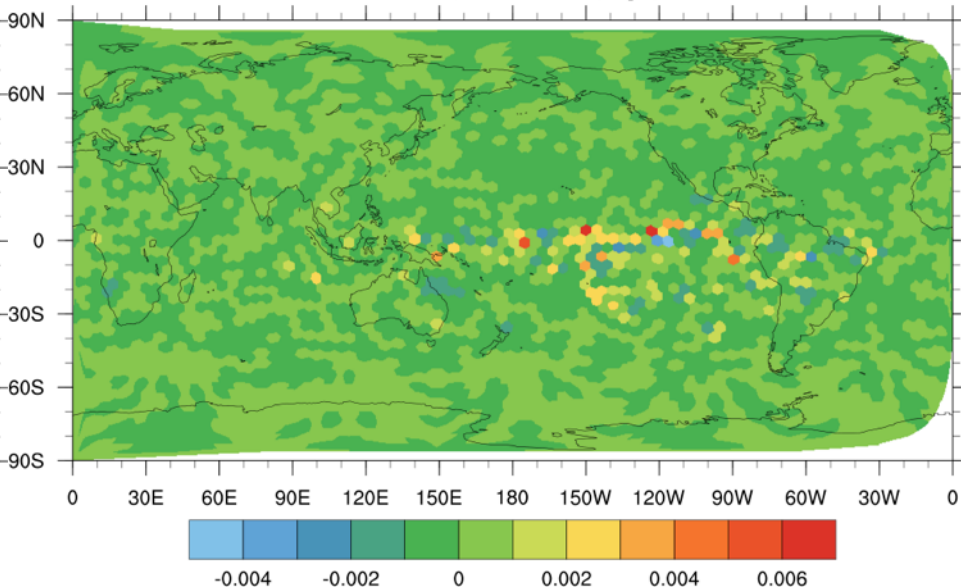
Increment, 3dvar, qv, k=3

(total) analysis increment for 3denvar (NICAS loc.)

Increment, 3denvar, theta, k=3

Increment, 3denvar, qv, k=3

Next

- Add CRTM(AMSU-A) interface (aircraft coming soon?)
- Static B for 3dvar
  - Even without balance operator, we can start "variance" of state variables and NICAS localization.
- Better understanding/use of HDIAG-NICAS
- Connect MPAS prognostic var. and MPAS/OOPS analysis var. more clearly
- Clean formula for variable transform (from MPAS??)

- More complete model Interface (something is still missing or has a limited capability)
  - FieldMPAS: read, write, print
- Use of Github for modified MPAS source code (MPAS-Dev)