CAM FVcubed Open Software Engineering Issues

Open Issues, some resolved

- Code cleanup; removal of extraneous code, addressing all 'TODO' points. => Mostly complete.
- Merge code into CAM5 => requires some intervention by Brian Eaton to build FVcubed in a portable way.
- stepon_init still needed ? (See TODO comment stepon.F90)
- Can diag_dynvar_ic be taken out of service ? (comment stepon.F90: this should no longer be needed since the order of physics and dynamics is now consistent with all other cores, except FV).
- Add non-hydrostatic dynamics support.
- proper location for initialization of PHIS (FV_StateMod.F90 TODO comment)
- Sign issues in FV_U/Vwind_latlon_to_dgrid (FV_StateMod.F90)
- Are U3S and V3S defined properly in inidat.F90 (comment "TEST::")?
- Update GFDL FVcubed: what version do we have? what is the newest GFDL? how do we best get the code from GFDL?

Updated to FV_cubed_sphere_GFDL_riga_201005 (latest).

- Turning off dynamics to visualize physics tendencies (Art)?

Art has successfully done this. The results of 'physics-only' look OK. Some minor changes to dp_coupling were needed.

- Test 3 is offset by 6 hours

Solved.

- Test 3: code is needed in GFDL fvcubed to simulate the vertical advection of the tracers. This code had been removed sometime between the 2008 and 2009 versions of GFDL.

Workaround: The code has been reinserted to the local branch of GFDL FVcubed.

- IC U/V-winds currently read in on A-grid, converted to edge-tangent D-grid winds internally. Do we need edge tangent winds in initial file? If so, should tangent directions also be on the file?

The short answer is no, not at this time. We should however
think about generating the D-grid winds for the J&W idealized
test cases, as this will remove initial interpolation errors.

- Should we write out edge-tangent D-grid winds to the history file? If so, tangent directions are needed, otherwise the winds lose their context.

This is not a priority, as there are few applications for
these D-grid winds. Clearly the edge tangent directions
must be provided also in order to form the context.

- initcom.F90 : future?? When can this be deleted?

This routine in FVCUBED only calls hycoef_init to initialize the
hybrid coefficients, possibly does slightly more in other
cores. This functionality should be moved elsewhere in the
long term.

- inidat.F90 : call dryairm under all circumstances? or only for moist_physics

Currently only for moist_physics. Christiane is reviewing
whether this is done properly, with help from the author,
S.-J. Lin.

- restart_dynamics.F90 : may have to add additional fields for non-hydrostatic dynamics, e.g. OMEGA