

CAM 4 Update

Phil Rasch

- The plan
 - Agenda and minor changes
 - A few odds and ends
 - What remains to be done before CAM4

Agenda

- Tue PM – A potpourri
 - Overview (Phil), Coupled simulations (Rich)
 - Activities related to CCSM
 - WRF & CAM (Joe)
 - IPCC (Jerry)
 - PBL & Convection
 - UW physics + Macrophysics (Sungsu)
 - Convection diagnostics(De-Zheng)
 - **New and short: Gravity waves (Yaga)**
 - Briefings (5 minutes)
 - Diagnostics (Andrew)
 - ARM datasets (Minghua)
 - **New and short: chemistry/climate issues (Peter)**
 - Open Discussion (Phil)

Agenda

- Wednesday PM (Joint with Chem-Clim WG)
 - Microphysics and Aerosols (Andrew G., Xiaohong, Jon Egill)
 - Radiative transfer (Andrew C)
 - Observational Constraints (David, Kevin, Cecille)
 - Planning (Minghua and Leo)

Things to mention in passing

- The new NCAR machine “bluefire” requires minor tweaks to job scripts, and for some model versions, tweaks to namelists or code. See <http://www.cesm.ucar.edu/models/atm-cam/> for a description (not there yet) or cam-dev mailing lists for Eaton’s email of last week
- Simplified Chemistry (Linoz +?)
- ?

Proposed Changes in SOM/CICE

- Previous versions of CAM embedded a SOM directly in CAM, and used:
 - A simplified version of the CSIM sea ice model (no ice dynamics)
 - Q-fluxes calculated from standalone CAM simulation + “kludge” to produce a reasonable seasonal variation of ice extent
 - Pros: matches observed SSTs closely, uses observed Mixed layer depths
 - Cons: kludge, climate sensitivity somewhat different from full CCSM coupling
 - ?: SOM run on CAM grid
- Proposed new SOM configuration uses SOM within standard CCSM coupler strategy
 - CICE (with or without ice dynamics)
 - Q-fluxes calculated from previous CCSM simulation
 - Pros: no kludge, climate sensitivity closer to CCSM
 - Cons: SSTs and Mixed Layer Depths match CCSM rather than Observations
 - ?: SOM run on POP grid
 - We hope we can also mimic the previous functionality by an untested strategy (how critical is this?)

Status of Candidate Processes (Part 1)

- Phase 1: Could be "finished anytime"
- Phase 2: absolutely critical
- Phase 3: should wait till phase 2 issues resolved

Option	Phase	Order	Date	Comments
FV core	0	0	Fall 2007	CAM 3.5
Dilute parcel	0	1	Fall 2007	CAM 3.5
Convection	0	2	Fall 2007	CAM 3.5
Revised def of sfc albedo	0	3	Fall 2007	CAM 3.5
Conv Mom. Trans	0	4	Fall 2007	CAM 3.5
Predicted Greenhouse Gases	1			Safe, a little more expensive
Morrison /Gettelman Microphysics	1* if we ignore AIE			Interaction with UW, Indirect effect, and ice are remaining areas to be resolved, AIE depends on aerosol module choice.
New Bulk Aerosols (predicted or prescribed)	1			Safe, but may be replaced by modal aerosols, influences the AIE
Flux Averaging	1			Safe, no brainer
Polar Filtering	1			Minimal effect I hope

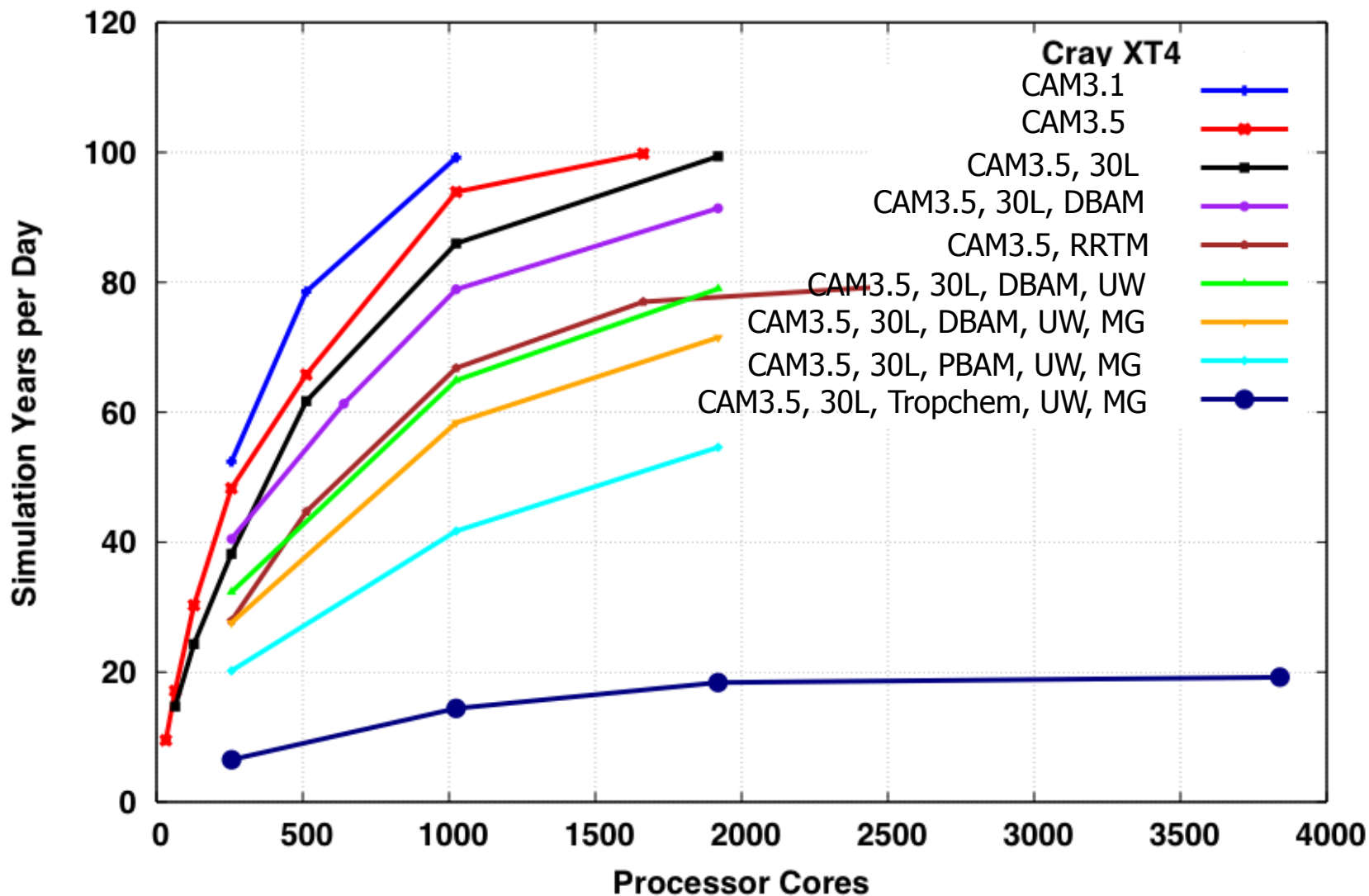
Status of candidate processes (part 2)

Option	Phase	Order	Date	Comments
UW Shallow+PBL	2			Need for explicit coupled testing
Revisions to Condensation/Evaporation	2			Discussed here
Modal Aerosols	2			Discussed here Predicted/prescribed
RRTM	2			Aerosols, Ice, Remaining software engineering nearing completion
Gravity Wave Tuning	3			Whenever Necessary
20m Surface layer	3			Now possible, but we havent demonstrated climate improvement yet
Modified Holtslag scheme	3			Minimal effect
Resolution	3			
Revisions to Ice Microphysics	3			Discussed here

Uncertain, probably need to wait until after phase 3

- Merging of HB and UW PBL
- PDF based Cloud Fraction
- Alternate Subgrid Column Generators
- Alternate Convection formulations

CAM Performance Evolution (FV 1.9x2.5, C0-C6)



Courtesy P. Worley with mods by PJR

Things to think about during these sessions (Phil's perspective)

- We won't be able to make the decisions here
- You could help us by:
 - Identifying criteria used to assess the processes
 - Reasons to choose one path rather than another
 - Subgroups that could help in assessing schemes, surmounting problems, doing things we don't have time for (e.g. SOM hypothesized Q-fluxes)