



AMWG Update

28th Annual CESM Workshop June 13 2023

National Center for Atmospheric Research is a major facility sponsored by the NSF under Cooperative Agreement No. 1852977



Here we value respectful dialogue, please...



Co-chair rotation!!

I will be rotating off after 6 interesting and eventful years.

Peter Lauritzen will become the new internal AMWG co-chair, starting this week.



June 2017



Julio

late June 2023



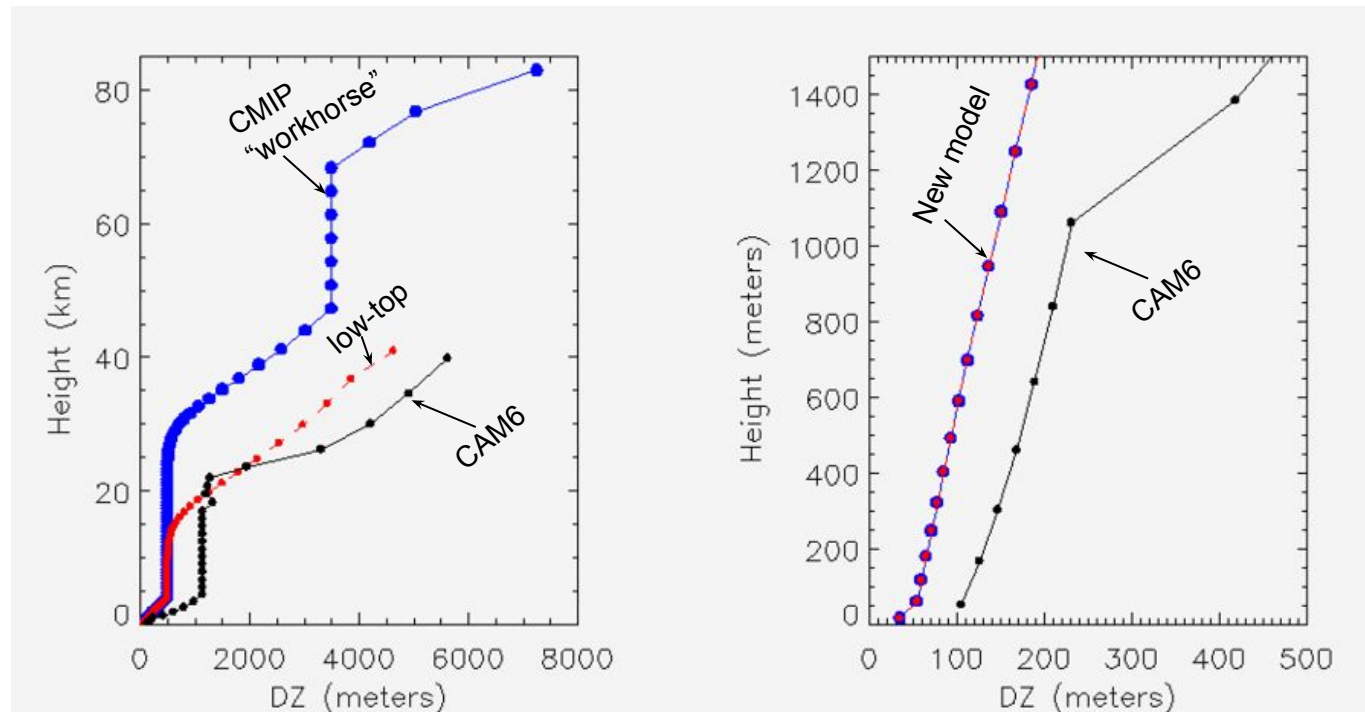
Peter



Where we are



New CMIP-class atmospheric model with increased vertical resolution is nearly finished. Two configurations have been developed: 1) CMIP "workhorse" (top ~80km) ; and 2) low-top (~42km) for development and testing.



***Physics re-ordering was part of development*

SE-dycore is used



Since January



- **New prognostic greenhouse gas configuration replaces “specified chemistry” - advected and radiatively active GHGs (including CO₂). Used in both L58(48km) and L93(80km) for simplified chemistry experiments: *{FLT/BLT}HIST* and *{FMT/BMT}HIST* compsets**
- **Updated secondary organic aerosols and aqueous chemistry**
- **Prognostic CLUBB momentum fluxes ($u'w'$, $v'w'$) now default**
- **Structurally unified gravity wave parameterization in L58 and L93**

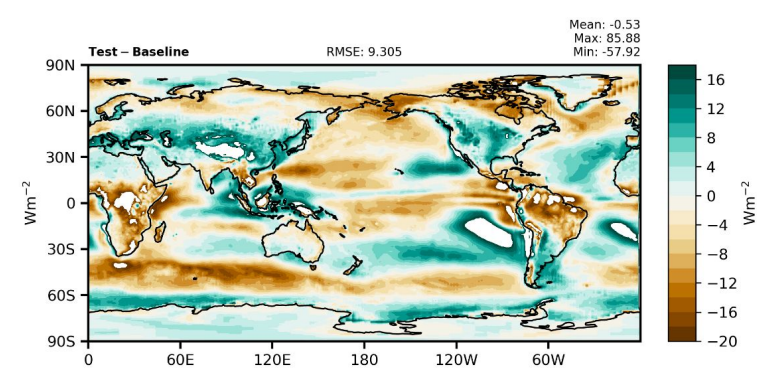
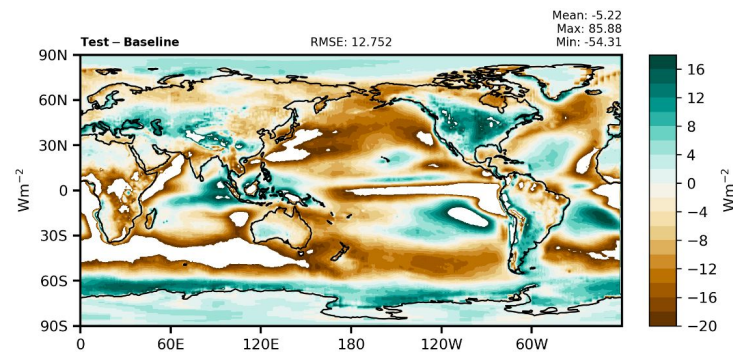
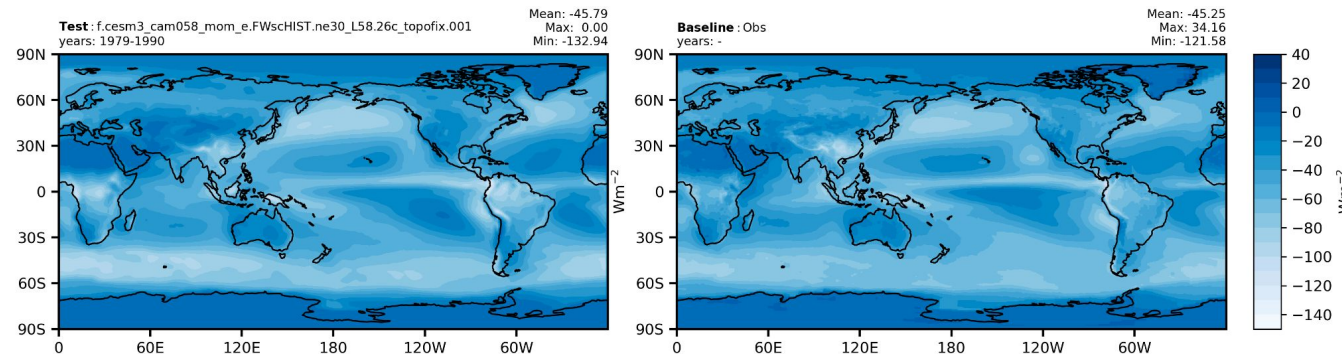
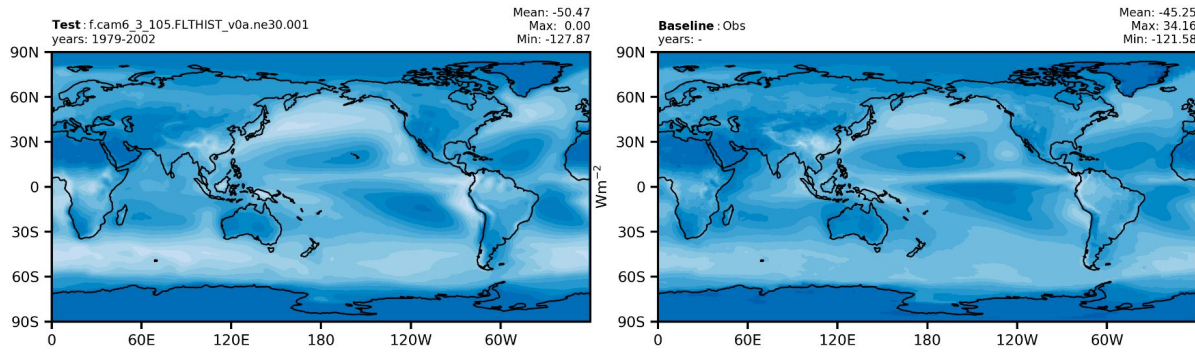
Chemistry changes resulted in brighter clouds

chemistry changes



SWCF - ANN - LatLon

SWCF - ANN - LatLon



Chemistry changes resulted in brighter clouds

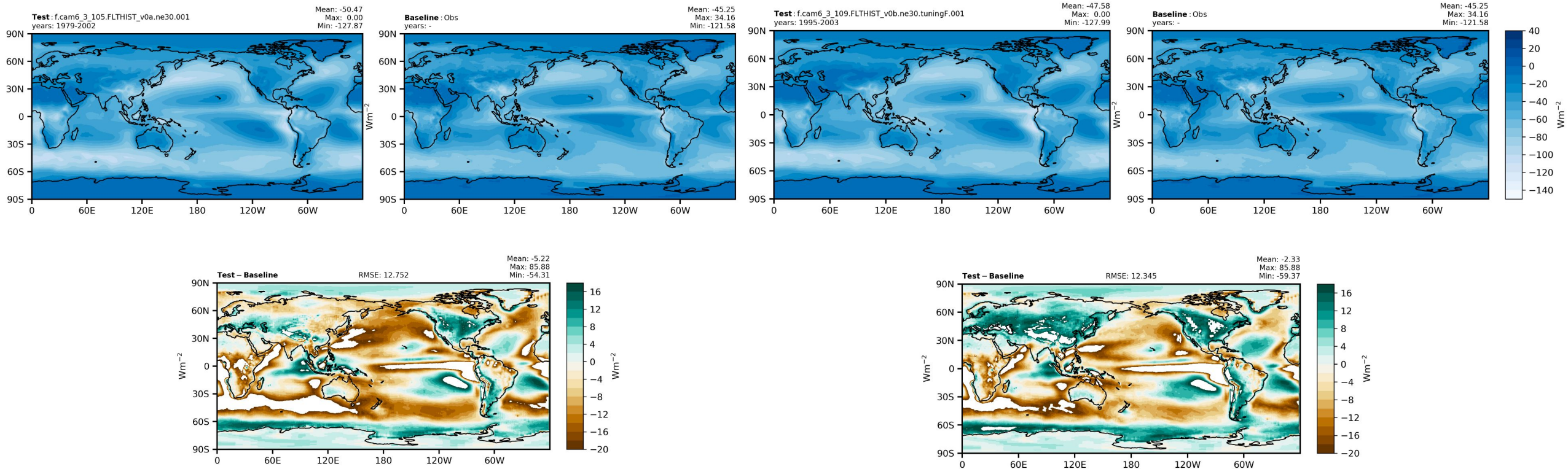
Retuning got us back some of the watts

“deep” retuning (Ben Stephens)



SWCF - ANN - LatLon

SWCF - ANN - LatLon



Initial coupled run (~2 weeks ago) had Lab Sea freeze - trying some StCu targeted parameters

GW configurations for CAM

May 1

	non_oro_GW	tau_0_abc	rdg_beta_effgw	rdg_beta_C_d	Levels
Default LT	Off	False	1.0	1.0	L58
Default_MT	On	True	1.0	1.0	L93

GW configurations for CAM

June 1

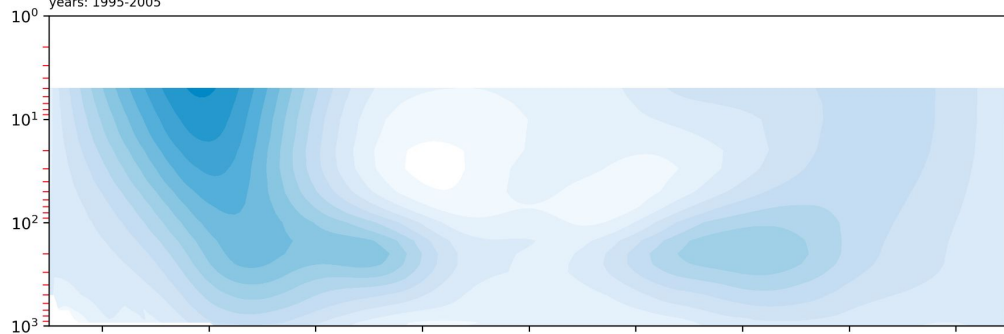
	non_oro_GW	tau_0_ubc	rdg_beta_effgw	rdg_beta_C_d	Levels
Default LT	On	True	0.5	1.0	L58
Default_MT	On	True	0.5	1.0	L93

Note: Convective source GW tuning is different

New FMT vs new FLT

U - ANN - Zonal - logp

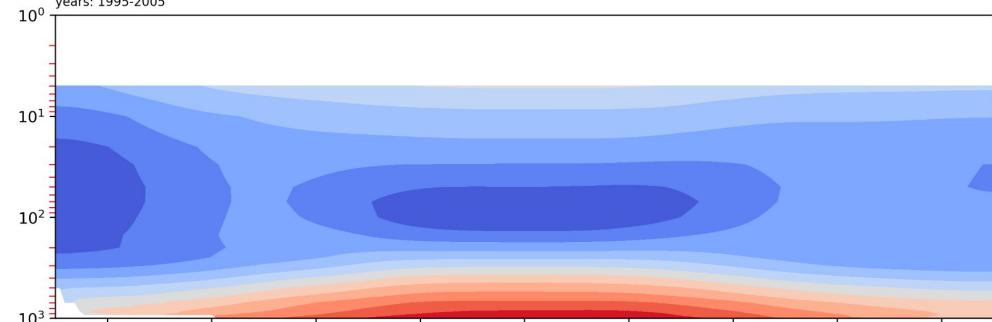
Test : f.cam6_3_112.FLTHIST_v0c.ne30.non-ogw-ubcT-effgw0.3-rdg_beta0.5.001
years: 1995-2005



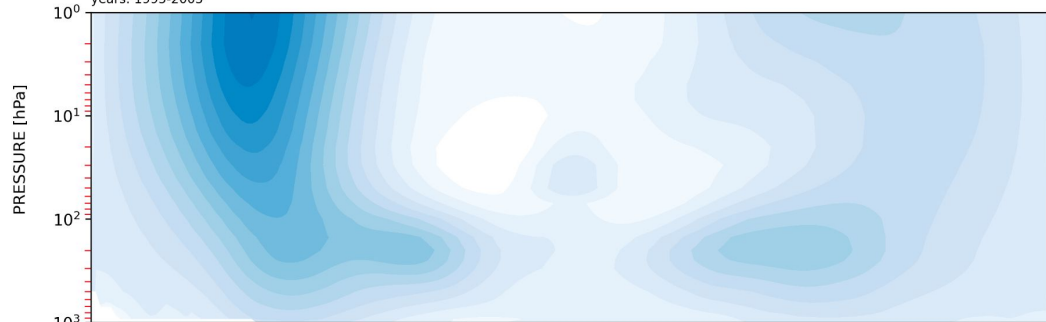
FLT

T - ANN - Zonal - logp

Test : f.cam6_3_112.FLTHIST_v0c.ne30.non-ogw-ubcT-effgw0.3-rdg_beta0.5.001
years: 1995-2005

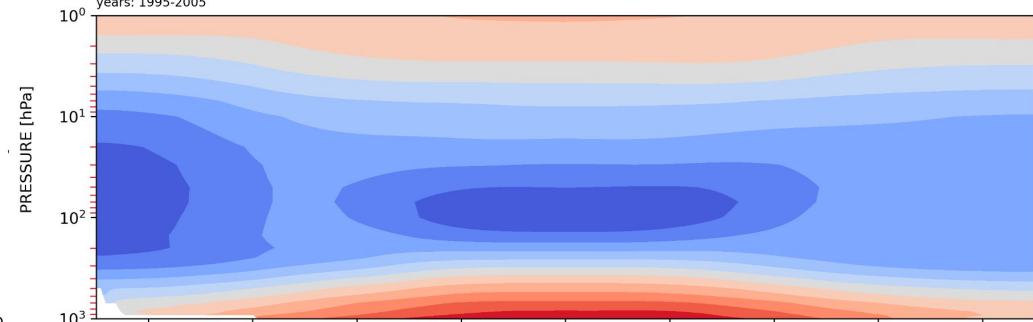


Baseline : f.cam6_3_112.FMTHIST_v0c.ne30.non-ogw-ubcT-effgw0.7.001
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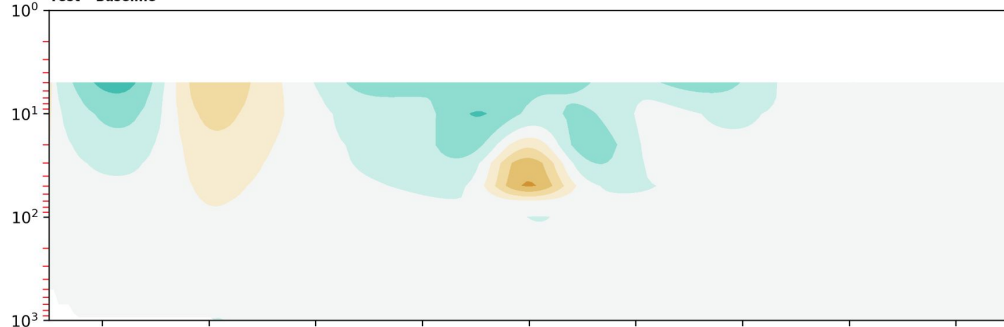


FMT

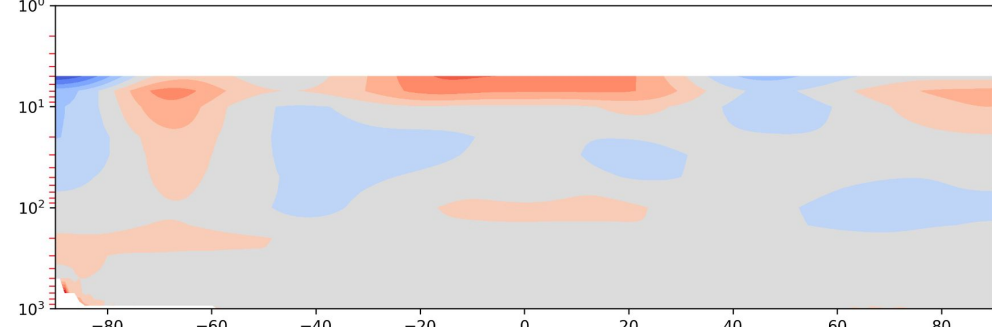
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years: 1995-2005



Test - Baseline



Test - Baseline

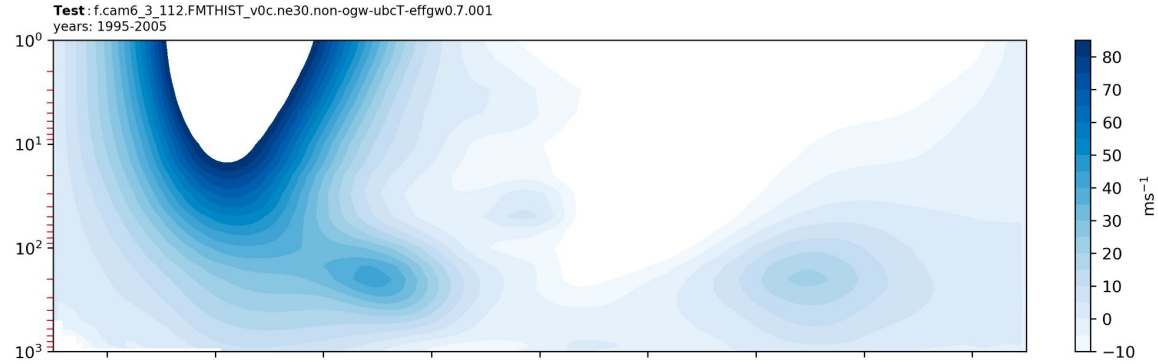


LATITUDE

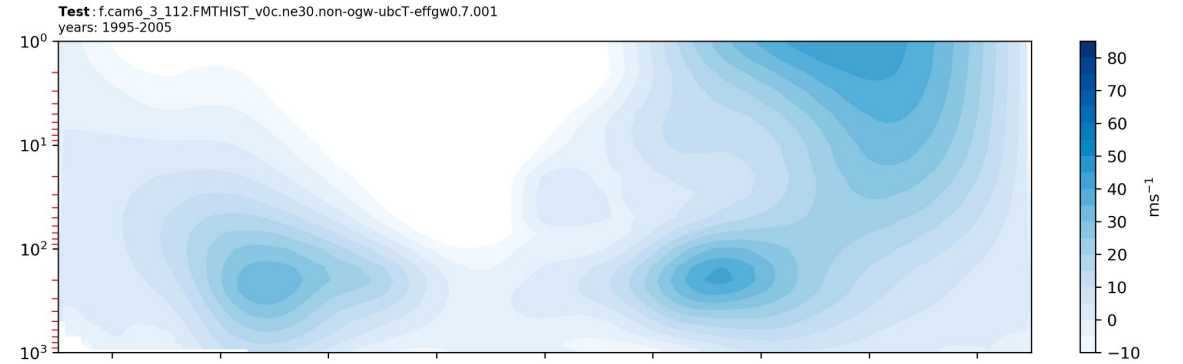
LATITUDE

As often happens OGW tuning leads to decent NH climatology but not so good in SH

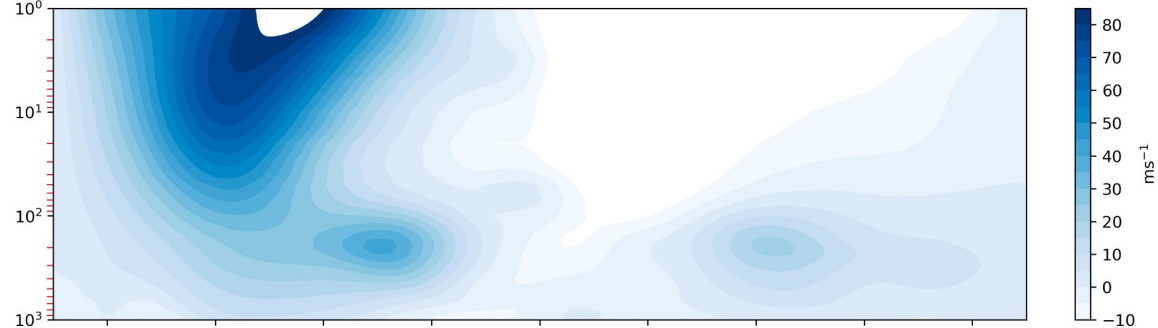
U - JJA - Zonal - logp



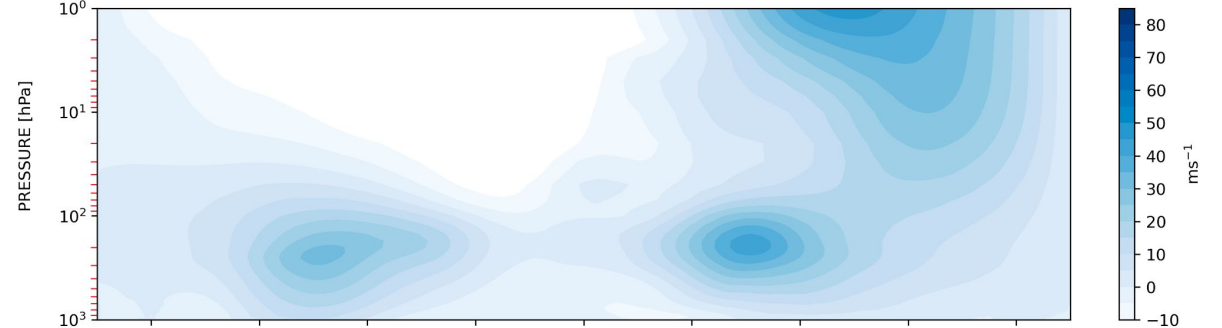
U - DJF - Zonal - logp



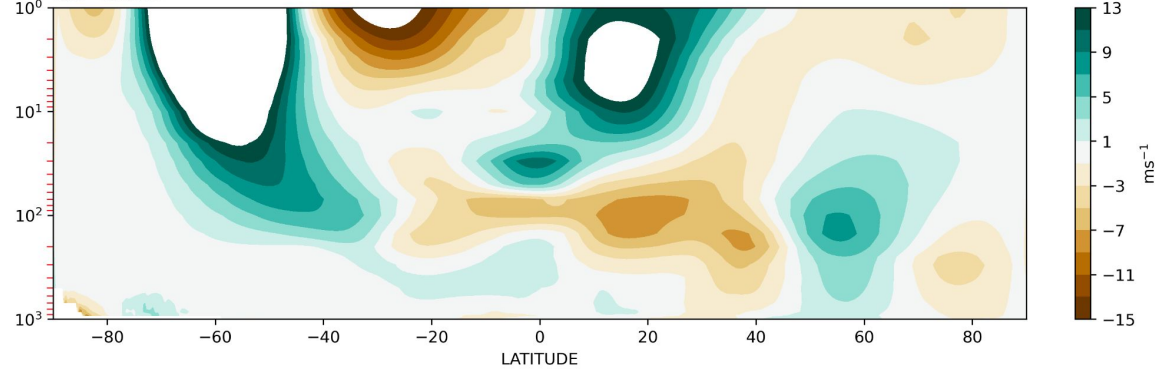
Baseline : U_ERA5_monthly_climo_197901-202112
Variable : U



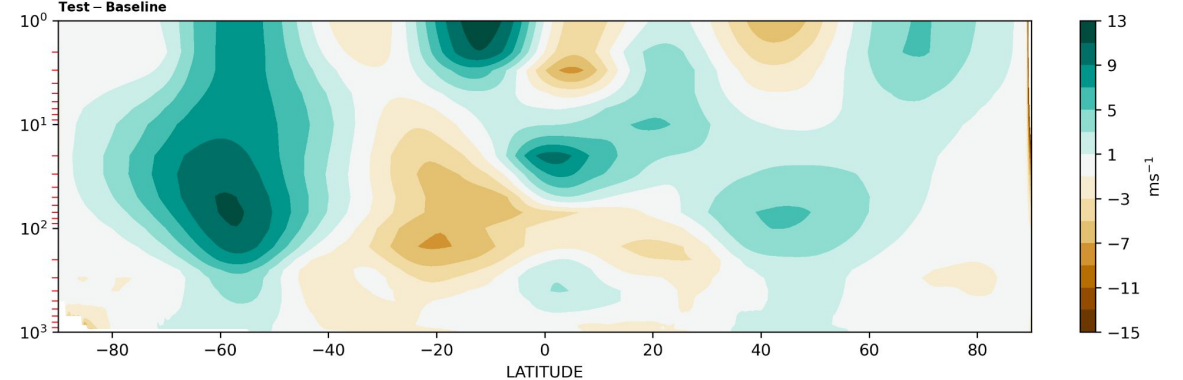
Baseline : U_ERA5_monthly_climo_197901-202112
Variable : U



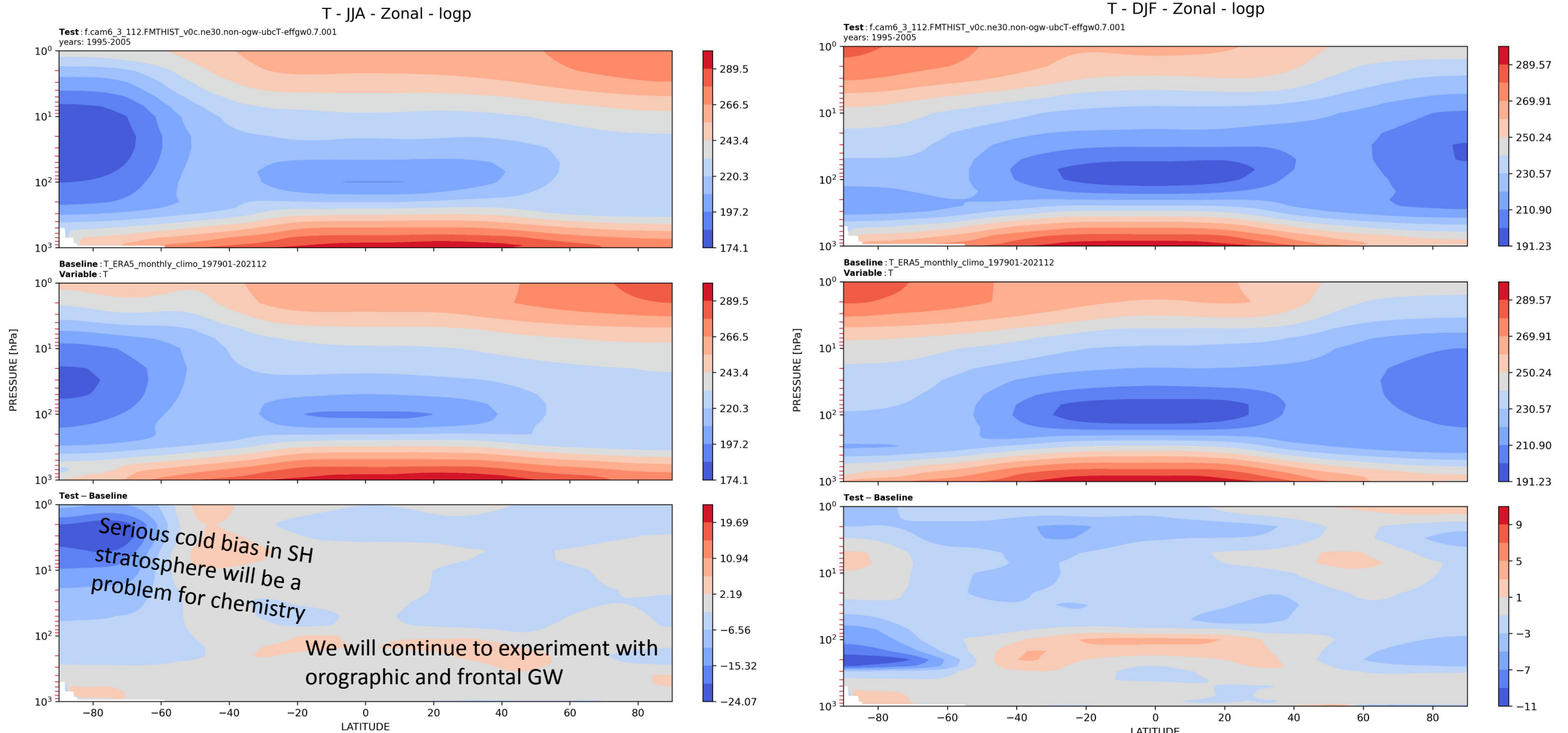
Test - Baseline



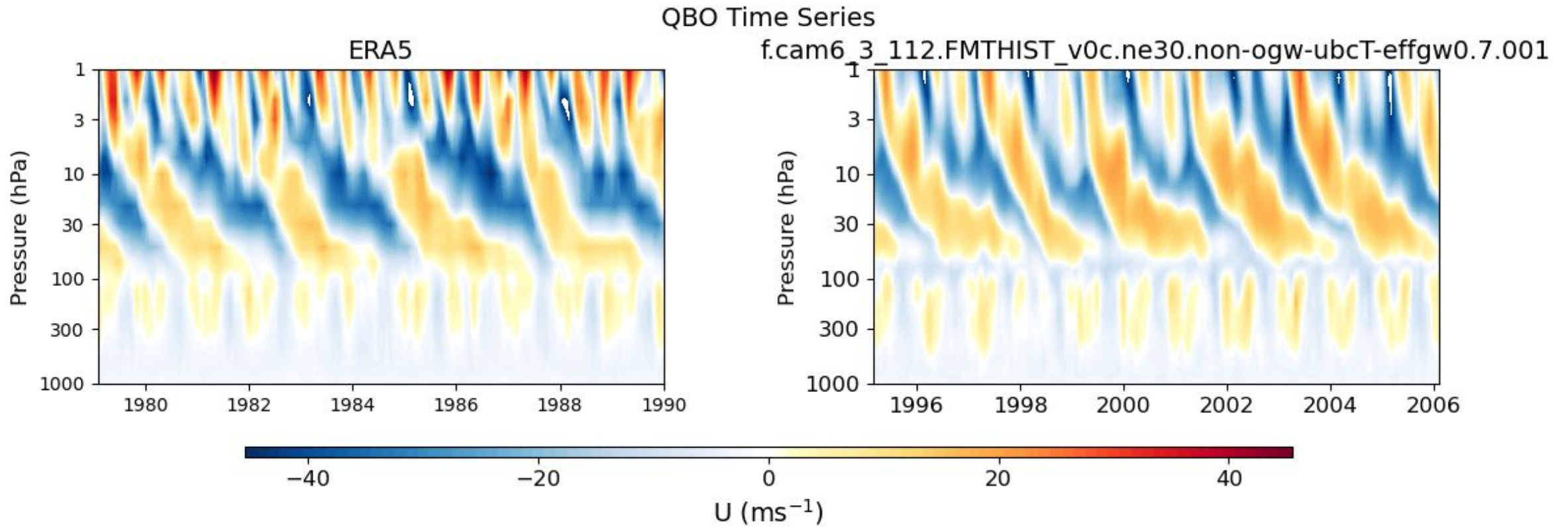
Test - Baseline



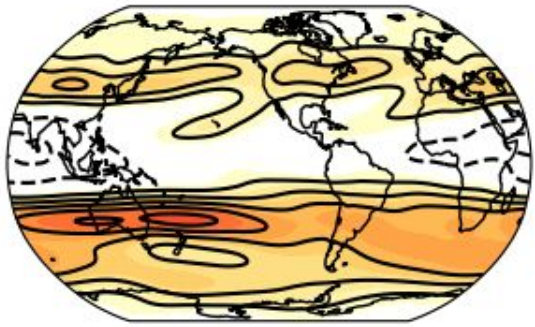
As often happens OGW tuning leads to decent NH climatology but not so good in SH



QBO is looking pretty good



ERA5

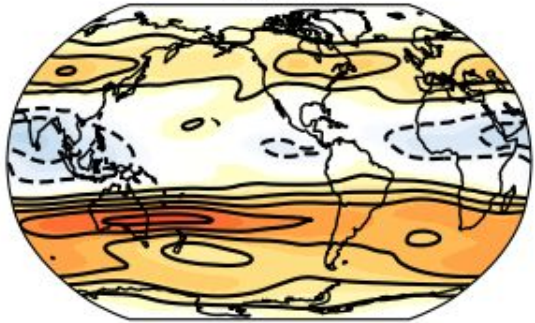


200hPa U, JJA

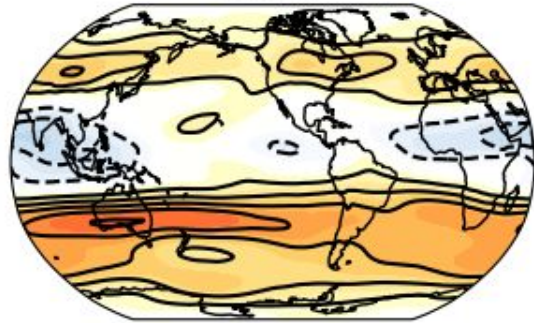
Other issues to keep in mind (*Isla Simpson*)

North Pacific jet isn't looking too great in the summertime

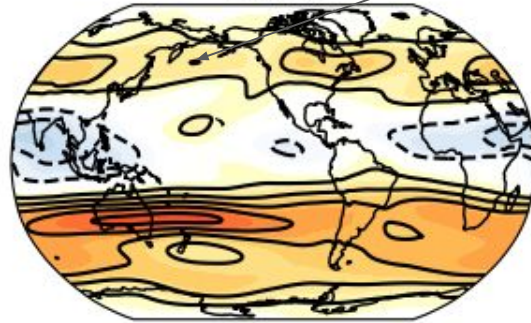
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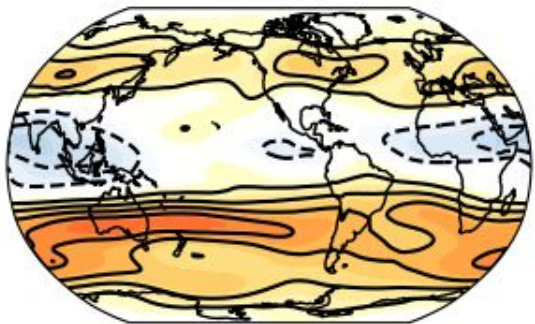
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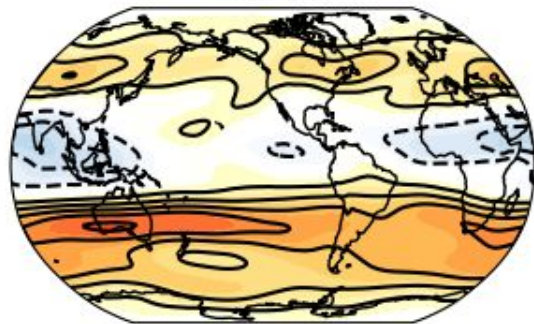
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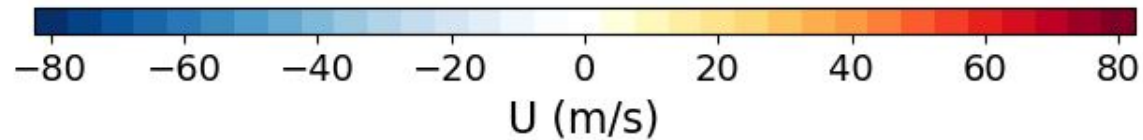
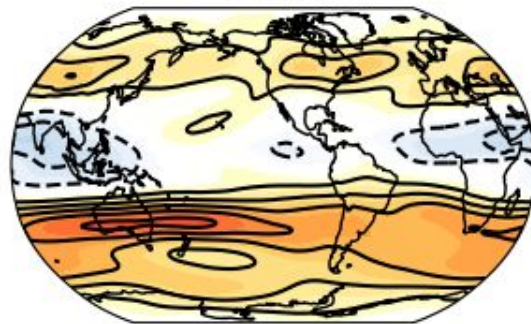
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#268

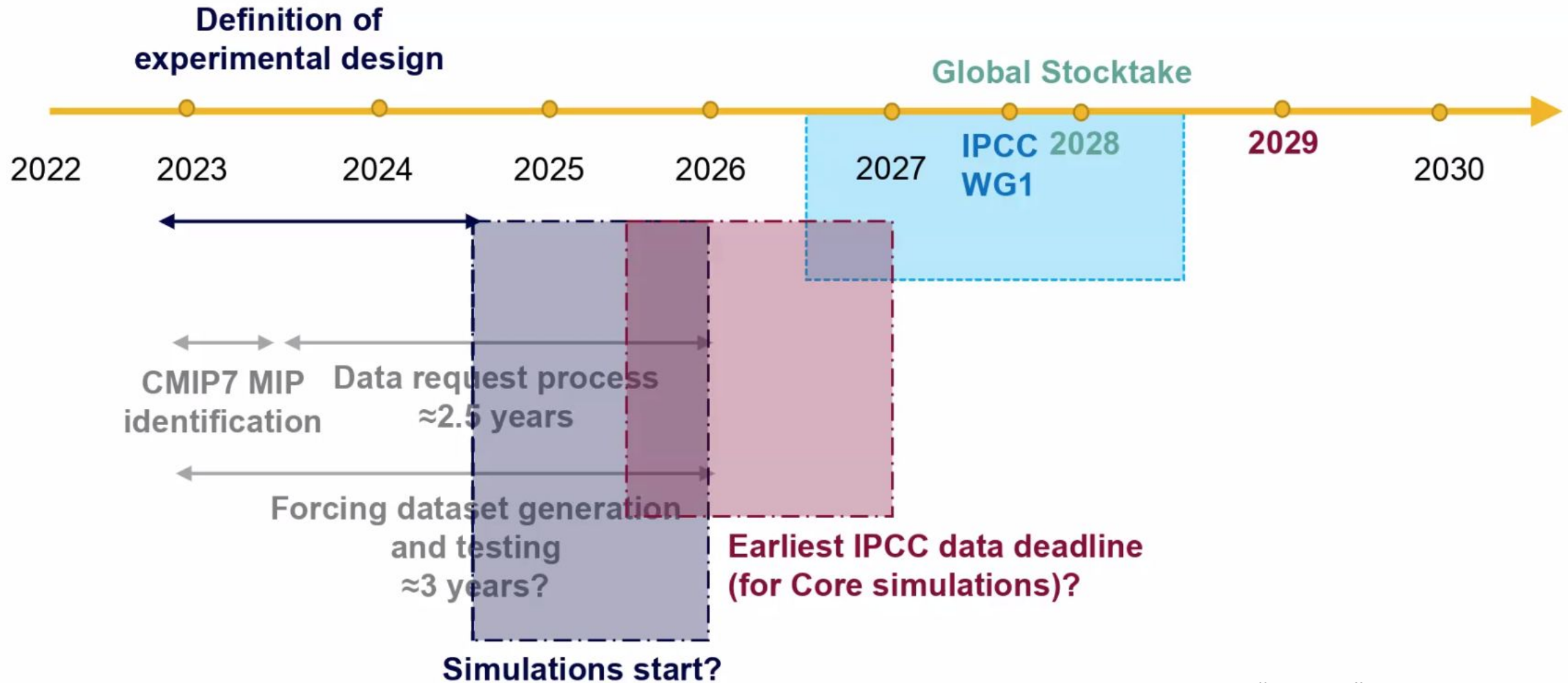


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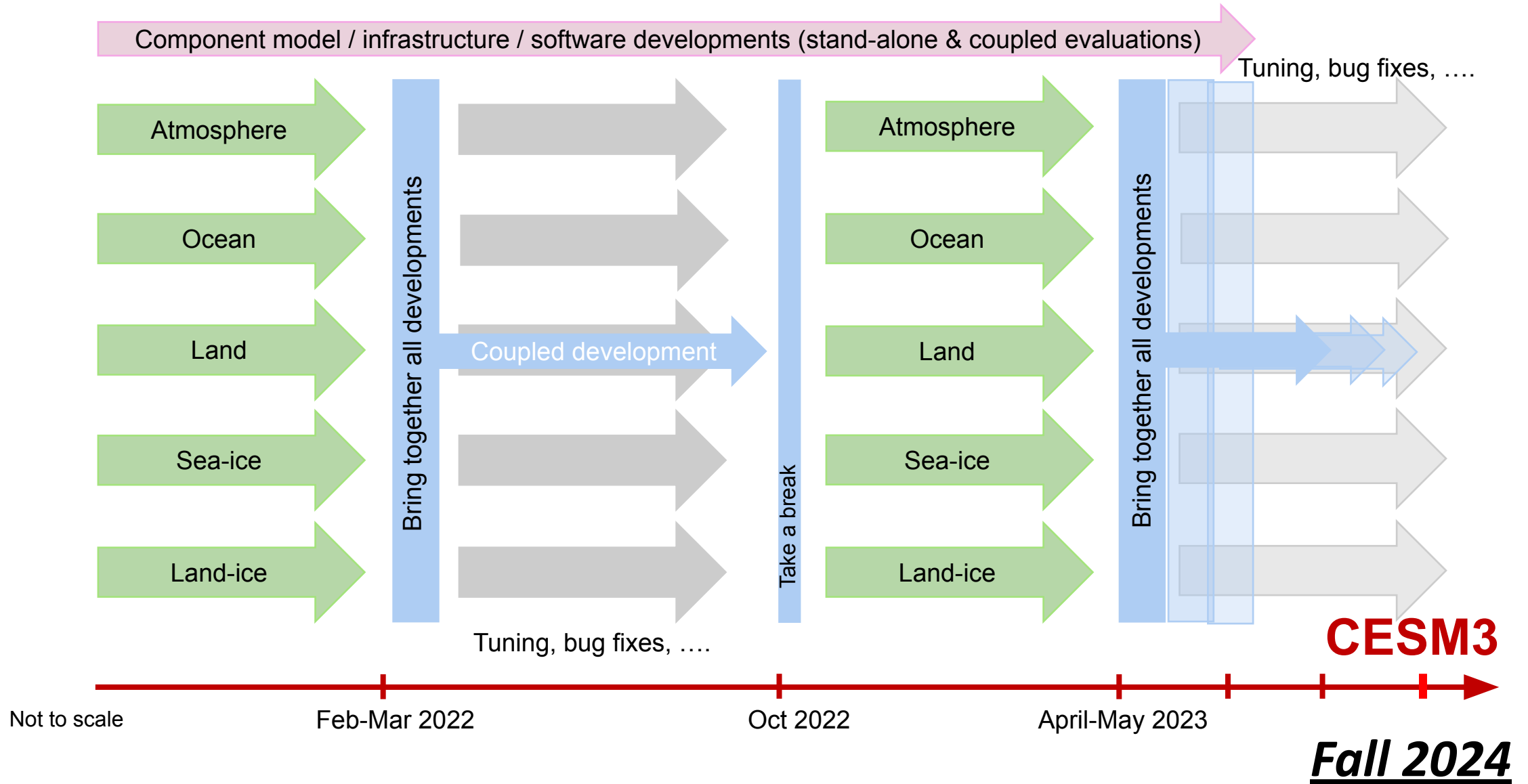
Where are we in the
development timeline

Proposed DECK and Core timeline (for discussion)



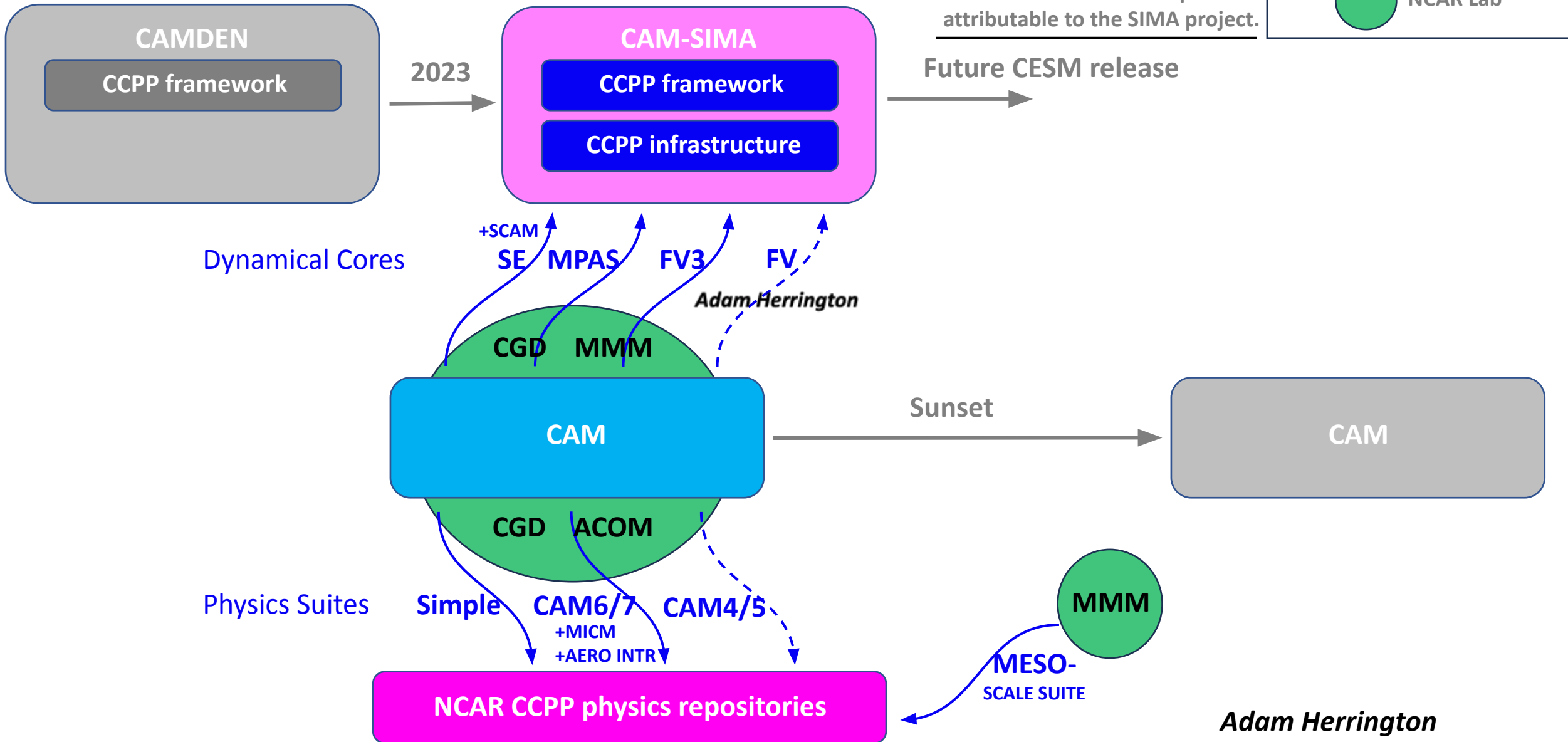
From a recent CMIP “drop-in” session, via Gokhan

Towards CESM3



From CAM to CAM-SIMA

The future – CCPP compliant – atmospheric component of CESM



Thank You!