Le multi-atlas “LMDZ patchwork” et l'évaluation des simulations LMDZ de 2016 à 2018

Ionela Musat, Journées LMDZ, 12 Juin 2018

Page d'accueil de la comparaison “RETRO6086”

https://vesg.ipsl.upmc.fr/thredds/fileServer/IPSLFS/fabric/lmdz/MultiSimu/RETRO6086/ACCUEIL.html

Série de simulations préparatoires à CMIP6, LMDZ-Orchidee, CTRL : AR4.0ada

ACCUEIL comparaisons | Atlas YEAR | Atlas DJF | Atlas JJA | ESM val tool | METRICS | Axes d'évaluation

RUN	Atlas YEAR	Atlas --DJF--	Atlas --JJA--	Outputs	Model Parameters	Tested Parameter	Period	bils	rt	rst	rlut	rlutcs	crest	crelt	cret	eva	pr	prw
CLIMATOS								7.097	0.7823	240.4	239.6	269.4	-47.05	29.84	-17.21	3.415	2.61	27.46
AR4.0ada	G - S	G - -	G - -	X	X	LMDZ5A	1982_1991	2.3313	2.262	242.251	239.989	269.468	-45.4436	29.479	-15.9646		2.82148	24.3664
NPv3.1ada	G - S	G - S	G - -	X	X	LMDZ5B	1982_1991	-1.5906	-2.408	237.567	239.975	267.2	-50.1772	27.225	-22.9522		2.86568	24.7668
LMDZv5.4	G - -	G - -	G - -	X	X	LMDZv5.4	1980_1999	-3.032	-3.0727	247.115	250.188	265.497	-41.8219	15.309	-26.5129		3.11406	24.319
LMDZv5.5	G - -	G - -	G - -	X	X	LMDZv5.5	1980_1999	2.5596	0.861	238.512	237.651	262.934	-49.1357	25.283	-23.8527		3.0326	25.9261
LMDZv5.70a	G - -	G - -	G - -	X	X	LMDZv5.70a	1980_1999	4.8724	3.668	239.86	236.192	261.743	-46.6778	25.551	-21.1268		2.94144	24.7437
LMDZv5.70aZ0	G - -	G - -	G - -	X	X	LMDZv5.70aZ0	1980_1999	3.2174	2.031	239.31	237.279	262.444	-47.5647	25.165	-22.3997		3.1217	26.7667
LMDZ608v3	G - -	G - -	G - -	X	X	LMDZ608v3, convection modifiée	1980_1999	3.517	1.961	243.37	241.409	263.065	-43.4943	21.656	-21.8383		3.13835	25.4671
LMDZ608v6	G - -	G - -	G - -	X	X	LMDZ608v6, avec ororgaphie modidiee	1980_1999	1.2798	1.4842	242.389	240.905	262.967	-44.3511	22.062	-22.2891		3.14293	25.2041
LMDZ608v6Wb3P05	G - -	G - -	G - -	X	X	LMDZ608v6, wbmax=3 , flag_wb=50	1980_1999	3.1942	3.4794	244.13	240.651	262.956	-42.7205	22.305	-20.4155		3.18044	25.4884
LMDZ608v6Wb3P05MyLm	G - -	G - -	G - -	X	X	LMDZ608v6Wb3P05, new_yamada4=y,lmixmin=0	1980_1999	3.1769	3.3834	243.814	240.431	262.746	-42.8959	22.315	-20.5809		3.18603	25.5334

Tour d'horizon du multi-atlas “LMDZ patchwork”

- Cartes (val. abs. ou biais) (J. Servonnat, L. Guez, I. Musat) ==> Atlas YEAR/ DJF/ JJA

- Des diagnostics spécifiques (régions, phénomènes,..) ==> Axes d'évaluation

- Métriques : Tuning (F. Hourdin), PCMDI (J. Servonnat) ==> METRICS

- Variabilité atmos.,atmos/océan: ESMVal (N. Kadygrov) ==> ESM val tool

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  Axe 1 : Continents : cycle diurne journalier t2m min/max (F. Cheruy)

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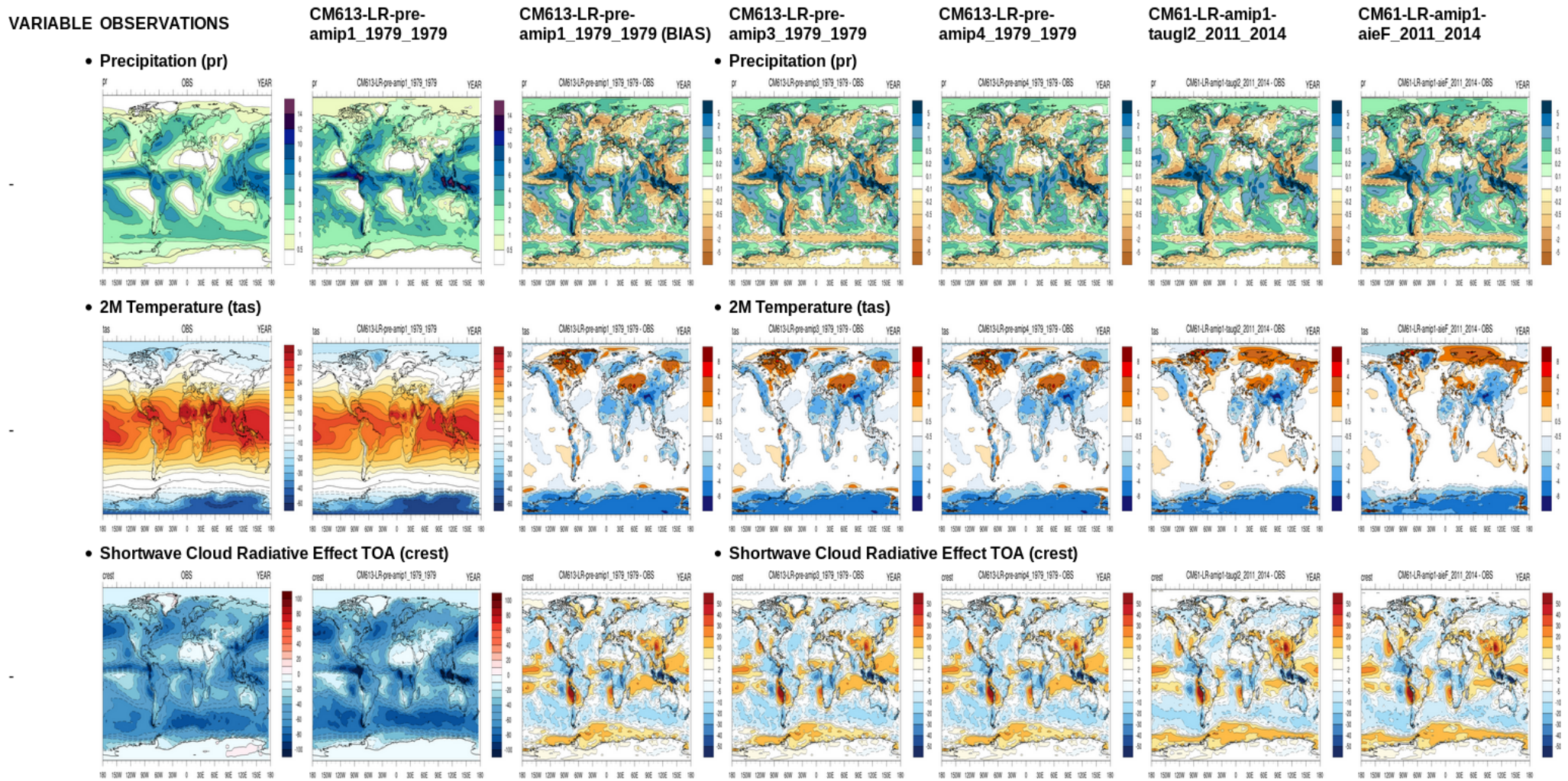
Atlas YEAR : les cartes des anomalies de pr, tas, crest, … en moyenne annuelle (1/2)

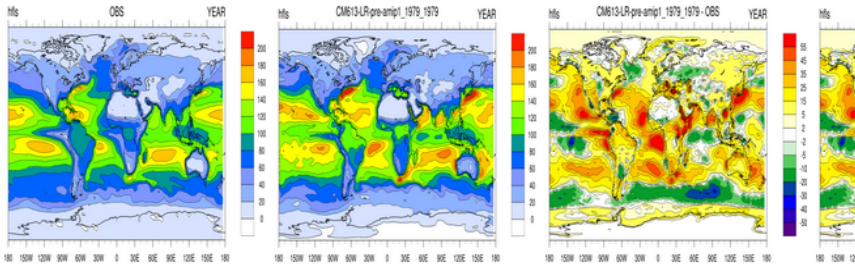
Multi atlas, YEAR, simulation de référence : CM613-LR-pre-amip1_1979_1979 (BIAS)

2d vars



Atlas YEAR : les cartes de hfls et les coupes (latitude,altitude) de ta, ua, hur en moyenne annuelle (2/2)

- **Latent Heat Flux (hfls)**



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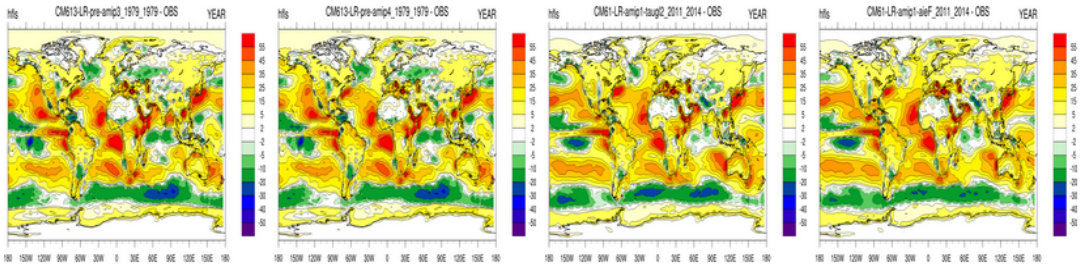
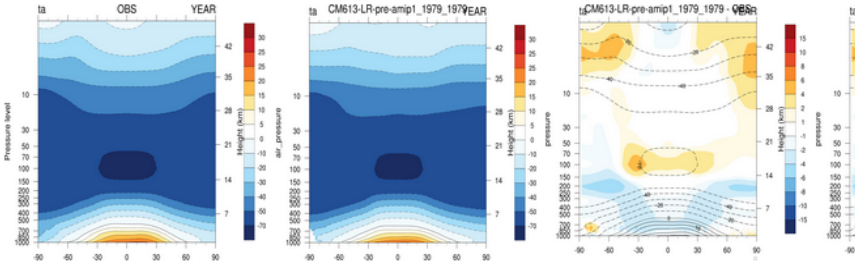


- **Air Temperature (ta)**



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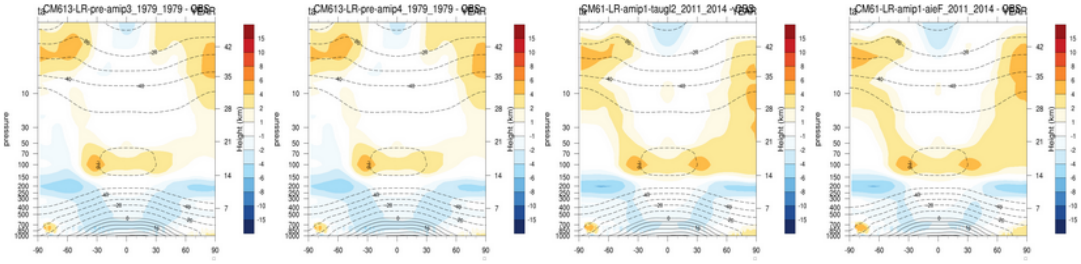
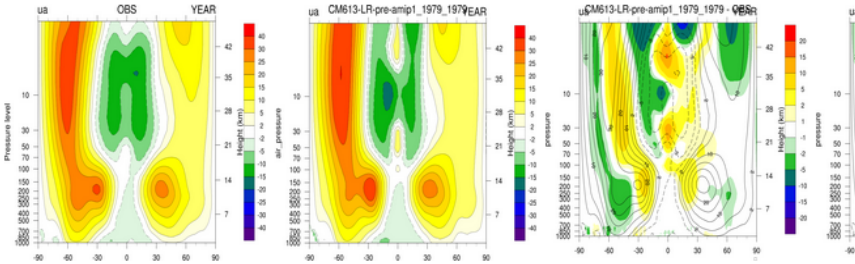


- **Zonal Wind (ua)**



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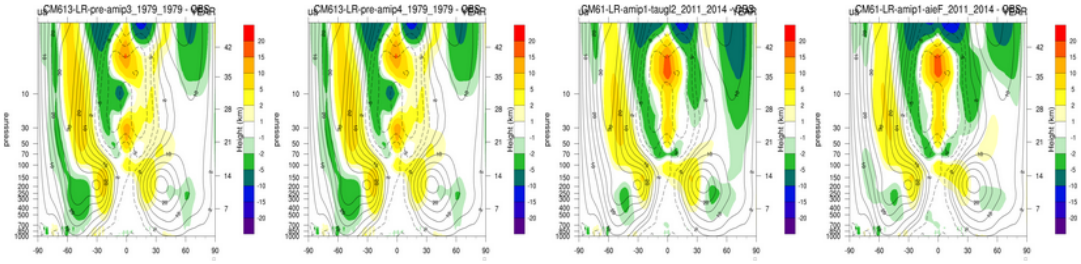
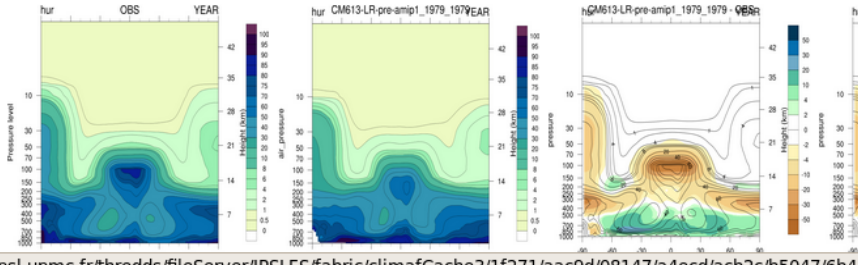


- **Relative Humidity (hur)**



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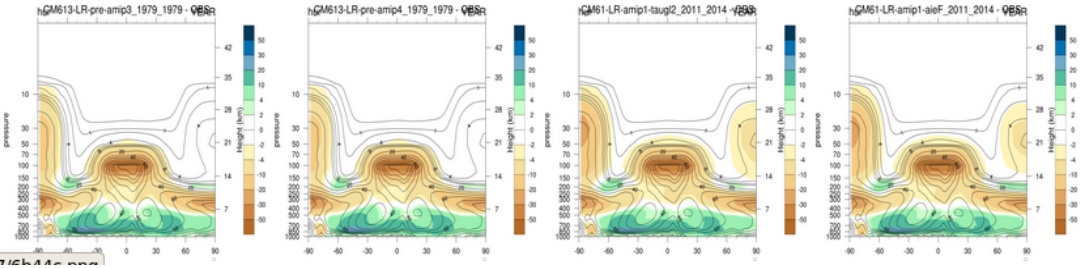

Page d'accueil d'une multi-comparaison :
Les axes d'évaluation

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Les axes d'évaluation du multi-atlas “LMDZ patchwork”

Des diagnostics spécifiques pour des régions et/ou phénomènes particuliers

==> 5/7 axes actifs

- Axe 1 : Continents : cycle diurne journalier t2m min/max (F. Cheruy)
- Axe 2 : Variabilité des précipitations tropicales (C. Rio, J.-Y. Grandpeix, M. Bonazolla, D. Cugnez, F. Hourdin)
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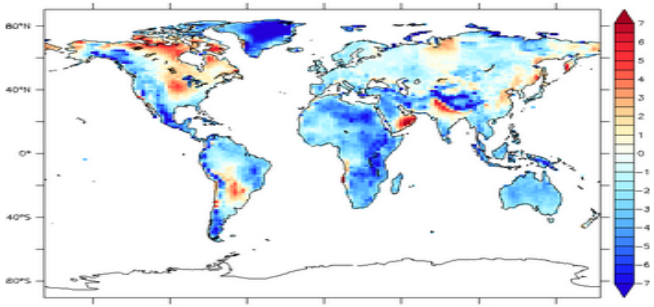
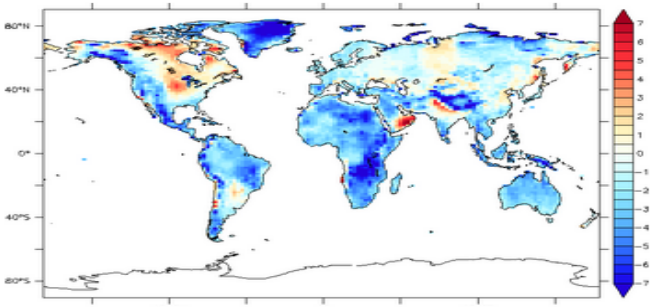
Axe 1 : surface continentale, t2m min/max DJF/JJA

Biais (LMDZ – CRU)

CM6010.2-LR-amip-G-02_biais.JJA



CM6011.3-LR-amip-cvoroH-G-02_biais.JJA



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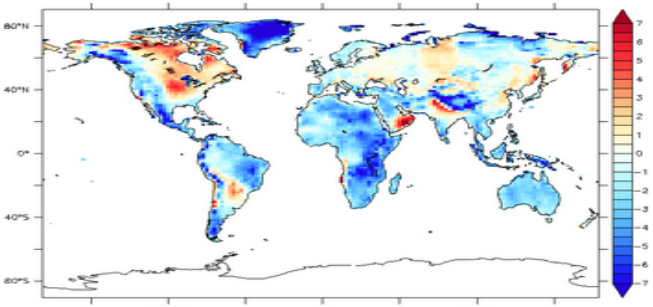
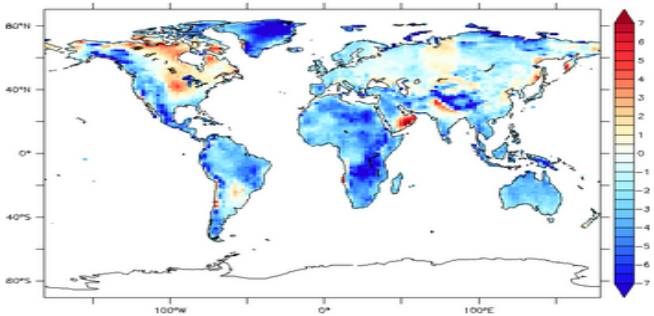
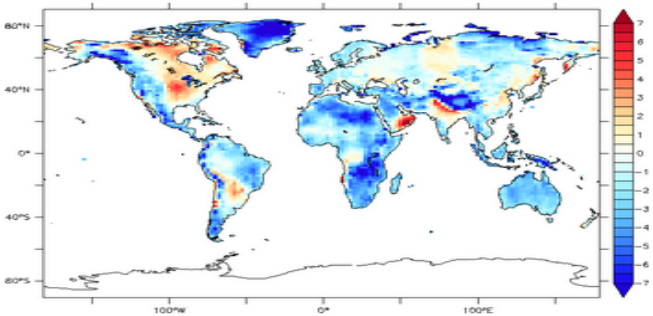


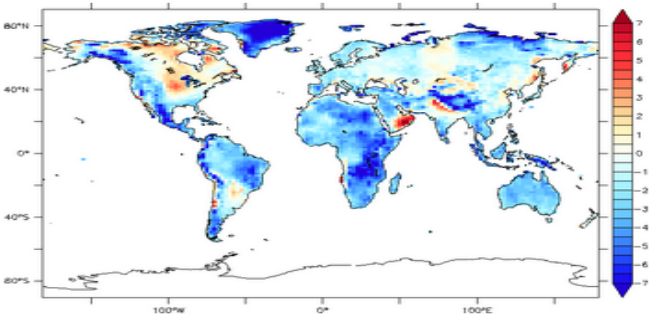
CM6011.3-LR-amip-split-G-02_biais.JJA



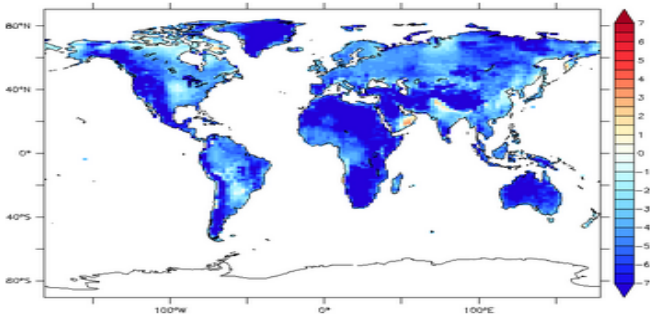
CM6011.3-LR-amip-trigB-G-02_biais.JJA



CM6011.3-LR-amip-ttop-G-02_biais.JJA



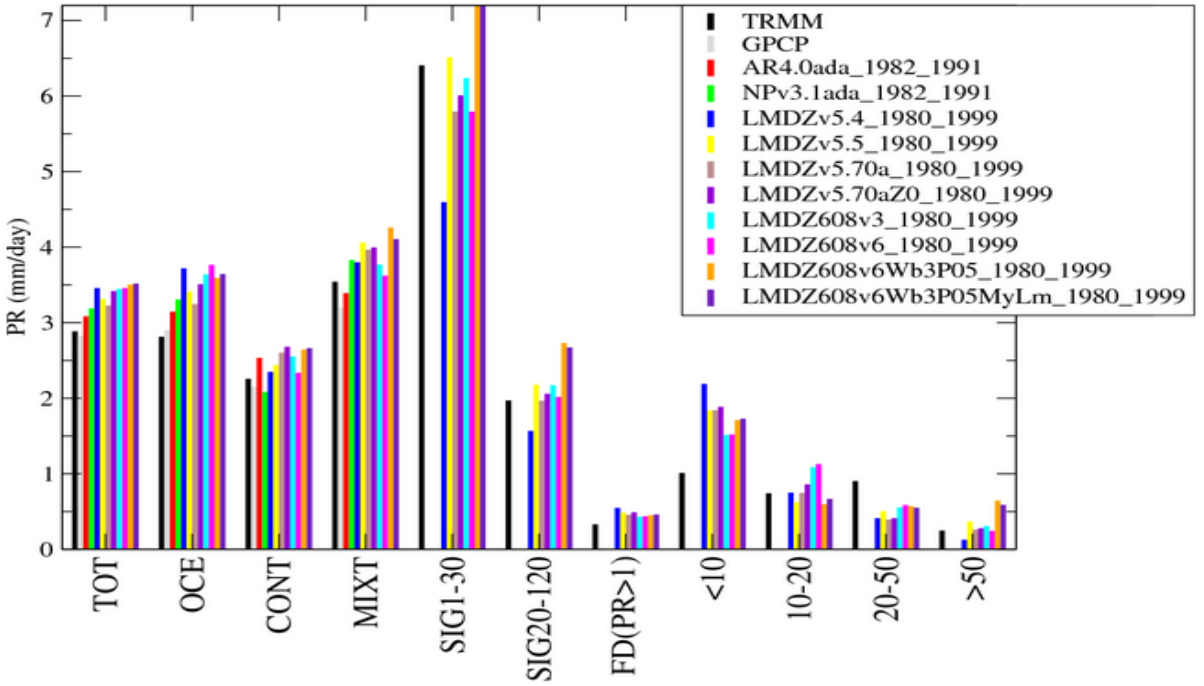
CM609-LR-amip-G-01_biais.JJA



Axe 2 : Variabilité des précipitations tropicales (glob, oce, ter, mixte) à différentes fréquences (<10, 10-20, 20-50, > 50) (1/3)

Axe 2: variabilité des précipitations tropicales

Responsable : Catherine Rio remplacée momentanéement par Jean-Yves Grandpeix et Marine Bonazzola
jyg@lmd.jussieu.fr,mbonaz@lmd.jussieu.fr



Liste de diffusion : lmdz_vartrop@mailhost.lmd.jussieu.fr

Analyse LMA (Local Modes Analysis)

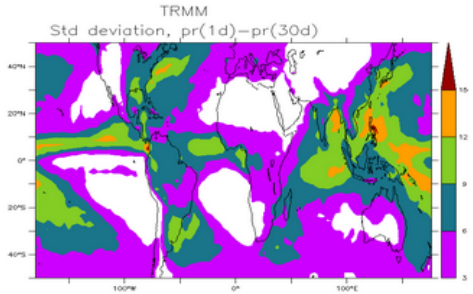
Variabilité des précipitations, comparée à TRMM

Variabilité des précipitations, comparée à TRMM (alternative)

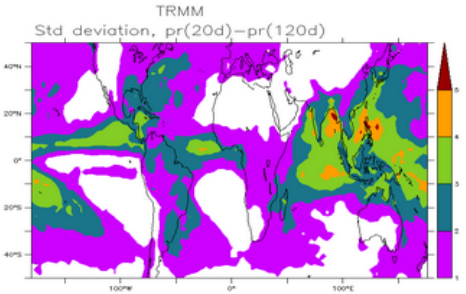
distribution moyenne précipitations, comparée à TRMM et GPCP (océan/continent)

Axe 2 : Variabilité des précipitations tropicales simulée par LMDZ et issue des observations TRMM (2/3)

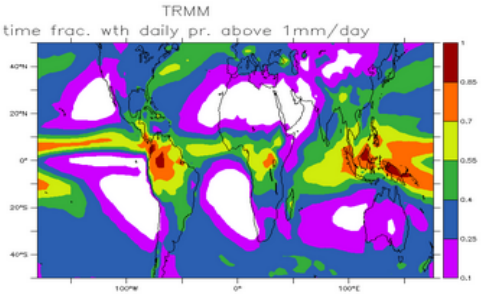
TRMM_hf



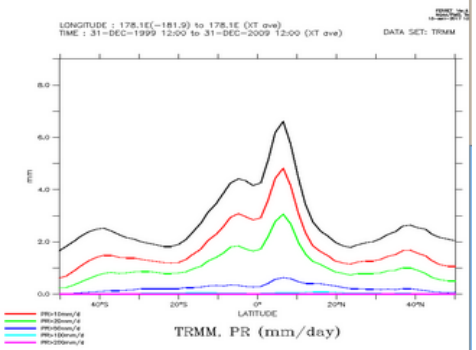
TRMM_is



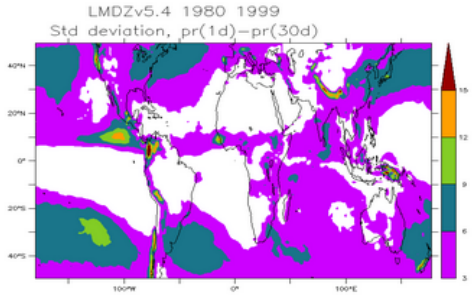
TRMM_nd



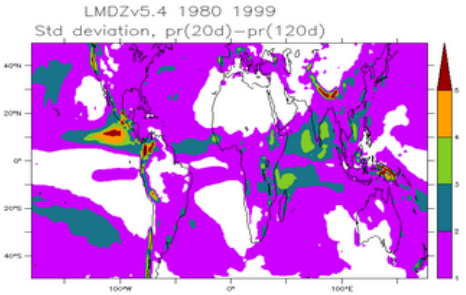
TRMM_zon



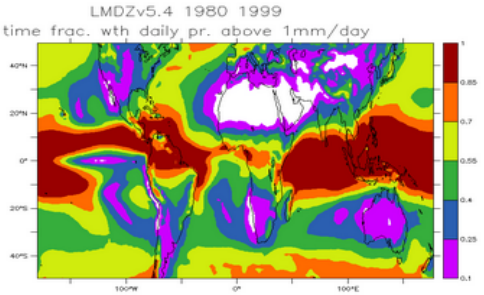
LMDZv5.4_1980_1999_hf



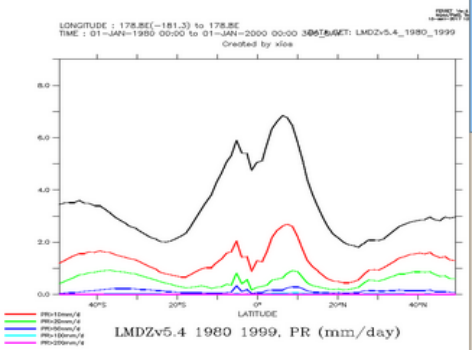
LMDZv5.4_1980_1999_is



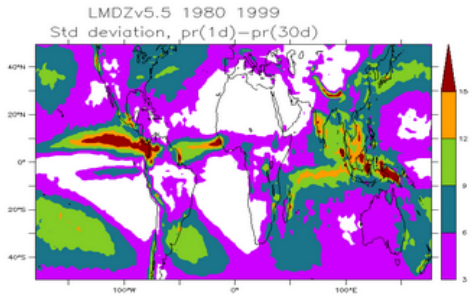
LMDZv5.4_1980_1999_nd



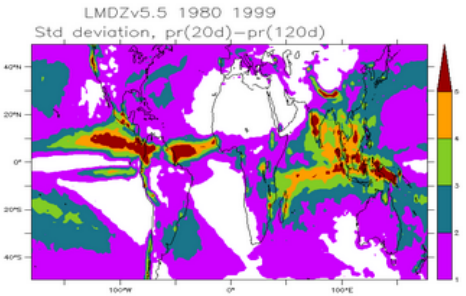
LMDZv5.4_1980_1999_zon



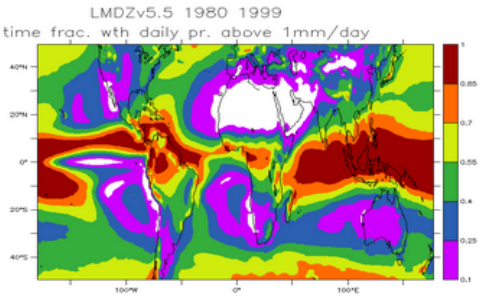
LMDZv5.5_1980_1999_hf



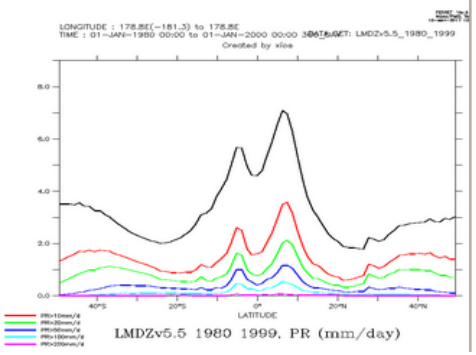
LMDZv5.5_1980_1999_is



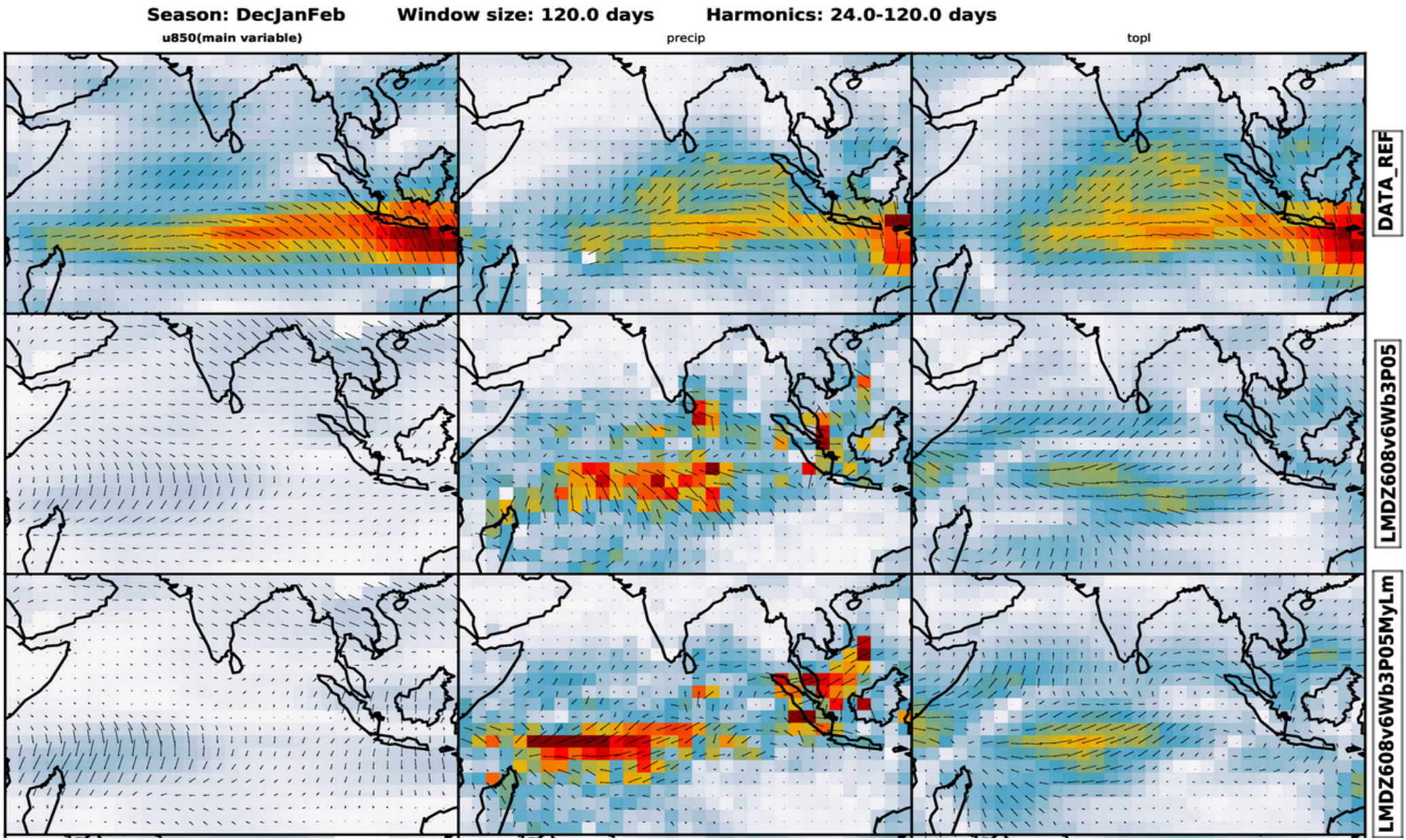
LMDZv5.5_1980_1999_nd



LMDZv5.5_1980_1999_zon



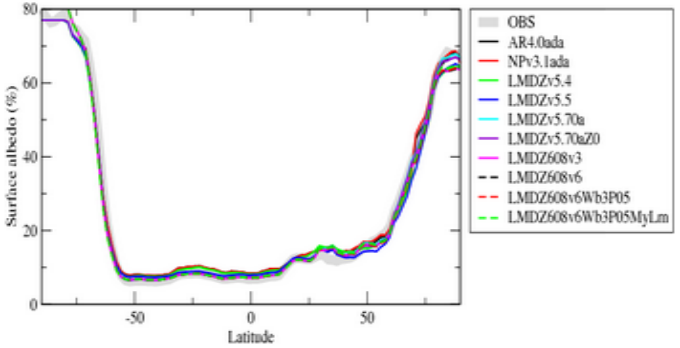
Axe 2 : Variabilité des précipitations en relation avec u850 et topl : résultats par la méthode LMA (3/3)



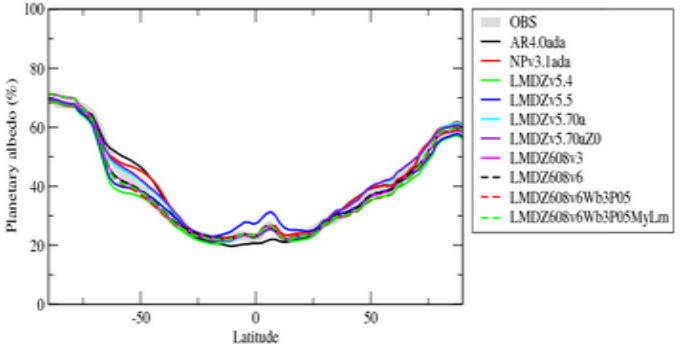
Axe 3 : Nuages et rayonnement (1/3)

Moyennes zonales PDF

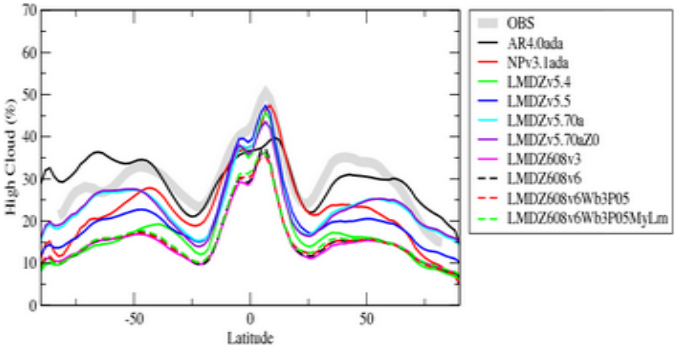
albszon



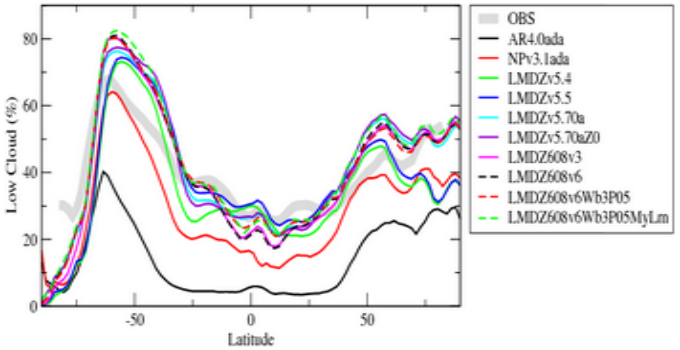
albtzon



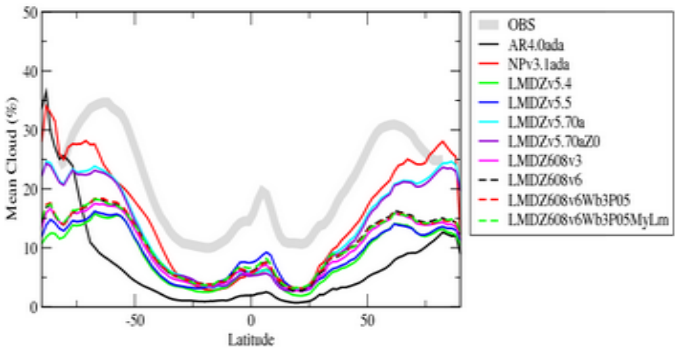
clhcalipsozon



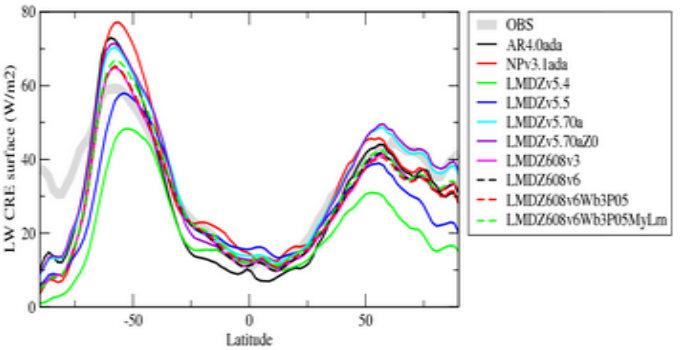
cllcalipsozon



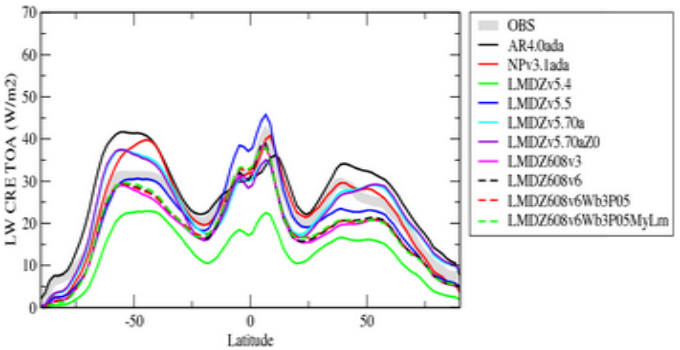
clmcalipsozon



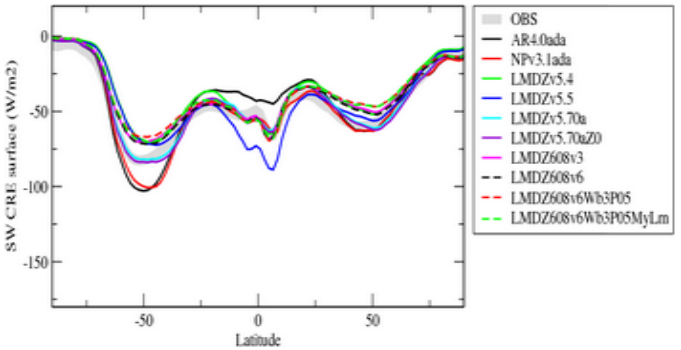
crelszon



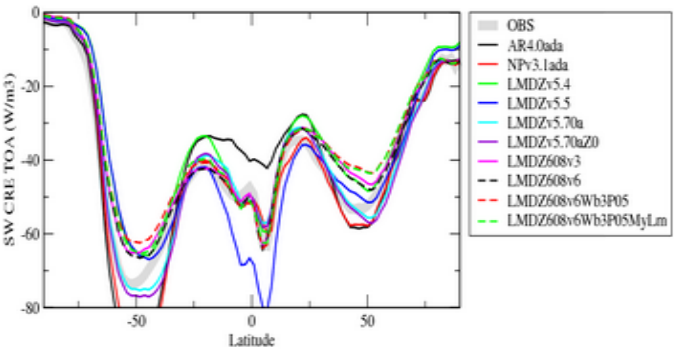
creltzon



cresszon



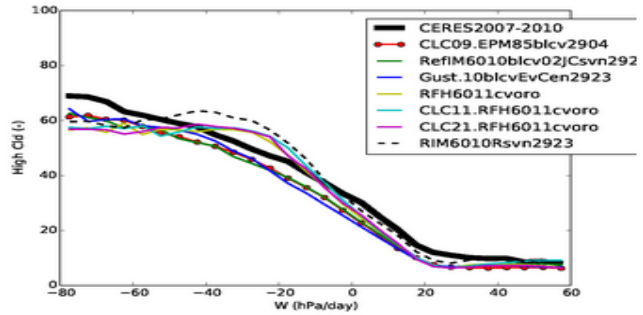
crestzon



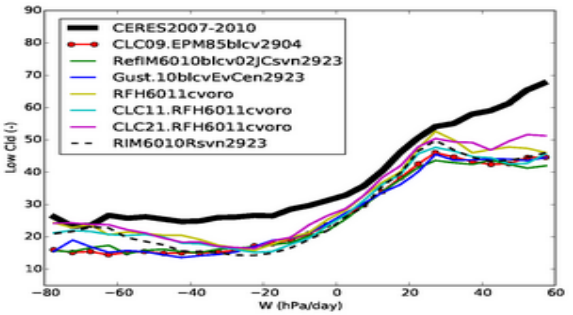
Axe 3 : Nuages et rayonnement (2/3)

Regimes dynamiques tropicaux PDF

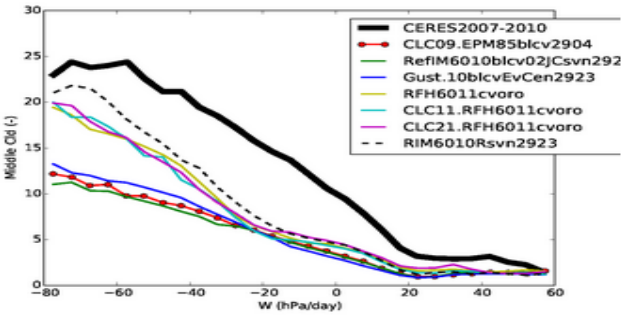
clhcalipso_Tun6011cvoro



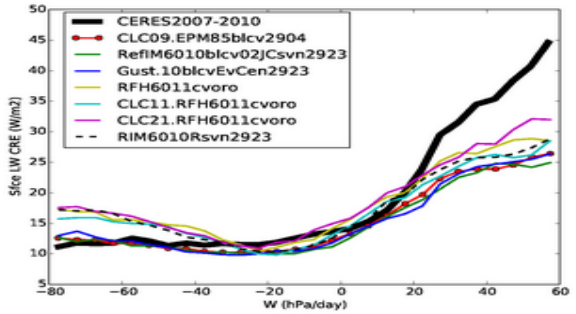
cllcalipso_Tun6011cvoro



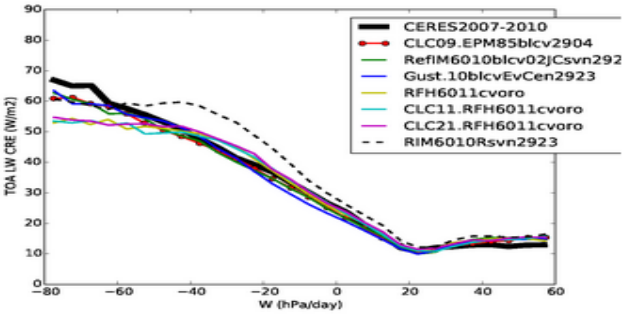
clmcalipso_Tun6011cvoro



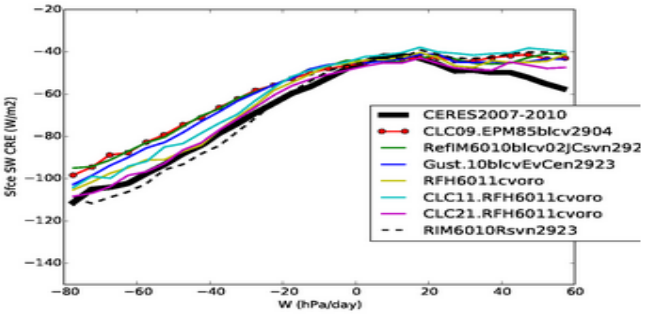
crels_Tun6011cvoro



crelt_Tun6011cvoro



cress_Tun6011cvoro



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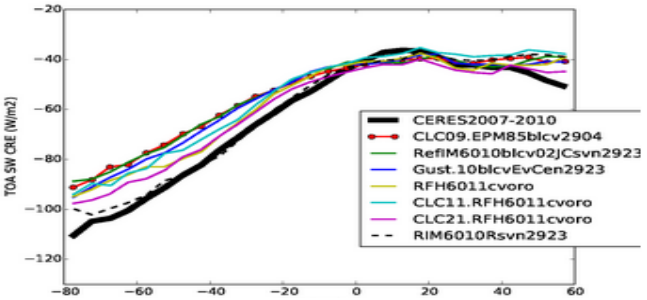
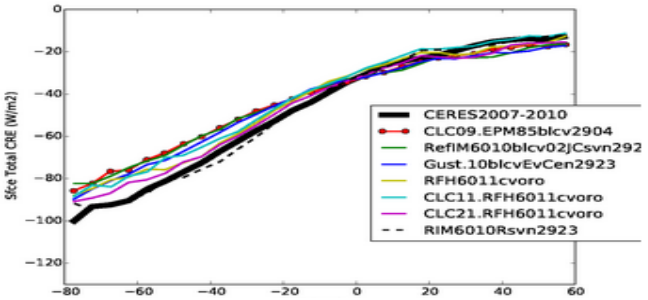
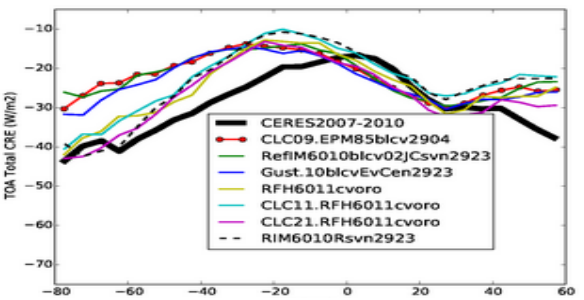


crets_Tun6011cvoro



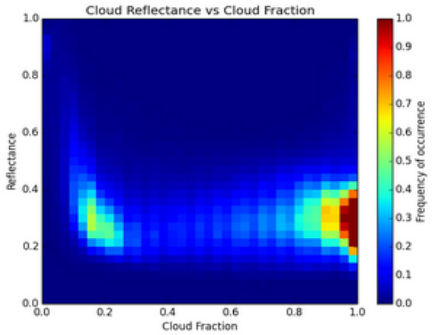
crett_Tun6011cvoro



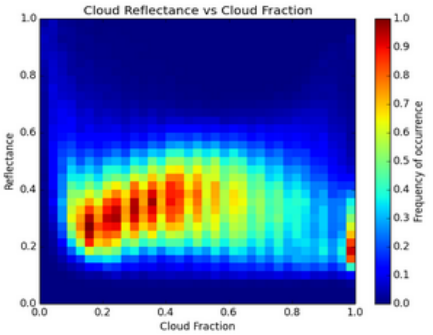
Axe 3 : Nuages et rayonnement (3/3)

Histogram Refl vs Cld PDF

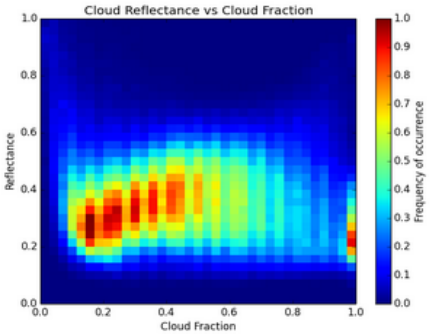
LMDZORv6010J_ReflCld



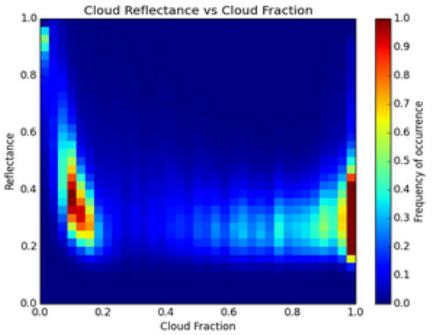
LMDZORv6011aero_ReflCld



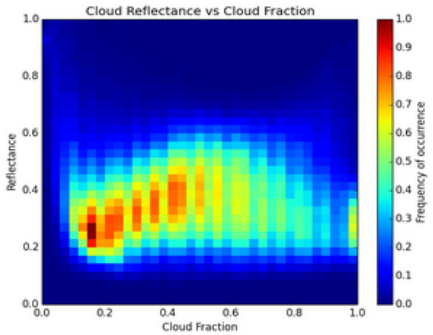
LMDZORv6011bosq_ReflCld



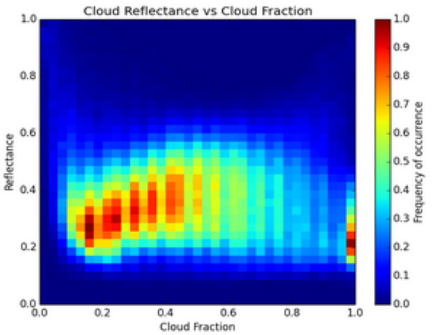
LMDZORv6011cvoro_ReflCld



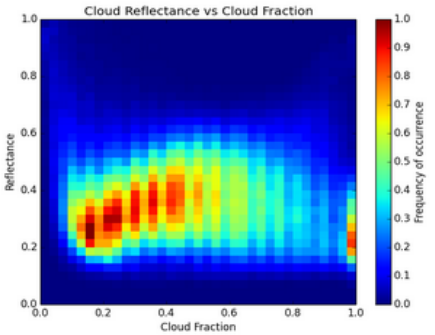
LMDZORv6011gust_ReflCld



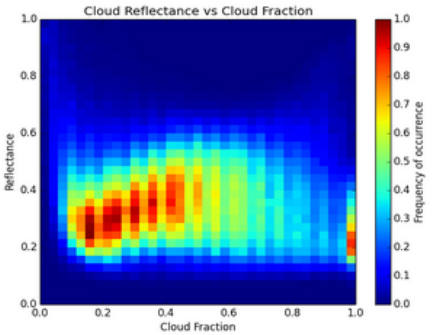
LMDZORv6011OrotkeA_ReflCld



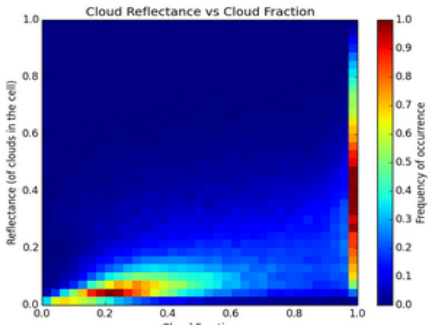
LMDZORv6011OrotkeC_ReflCld



LMDZORv6011_ReflCld



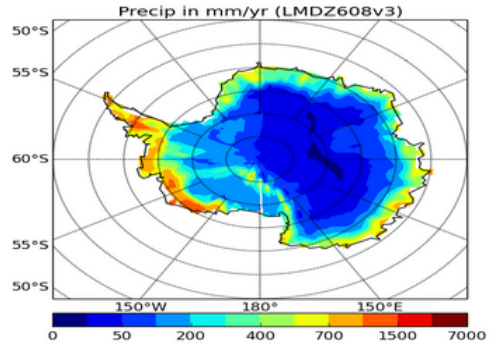
Obs_ReflCld



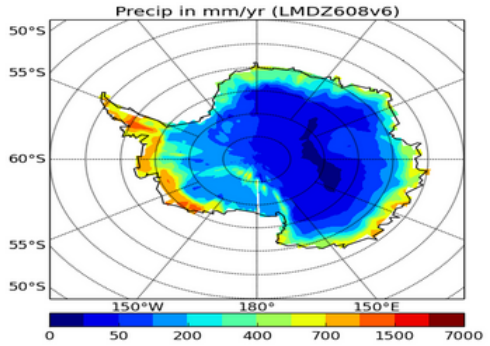
Axe 4 : Climats polaires
Précipitations LMDZ en Antartique et issues par Cloudsat (1/2)

Precip CloudSat PDF

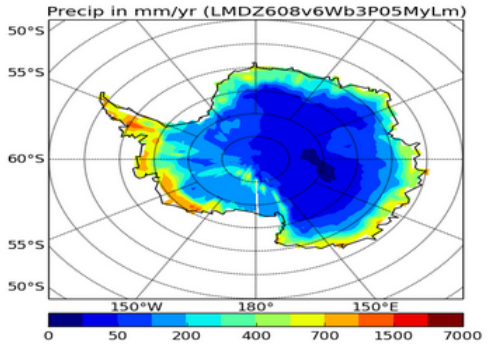
precipSH-LMDZ608v3



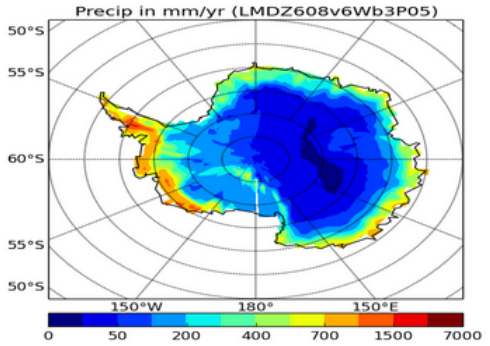
precipSH-LMDZ608v6



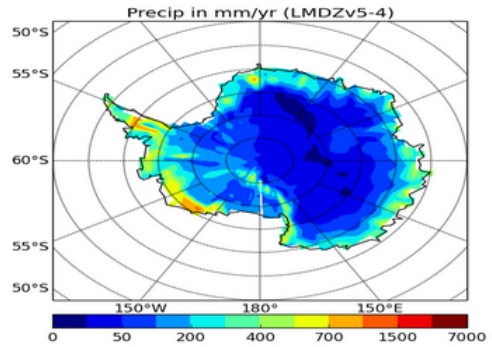
precipSH-LMDZ608v6Wb3P05MyLm



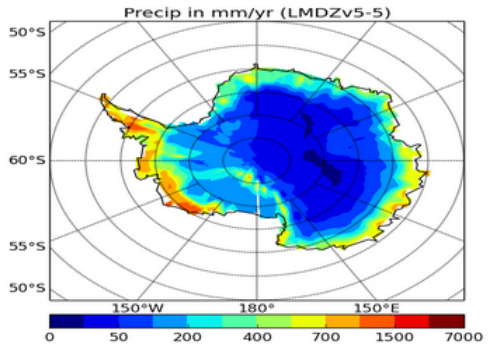
precipSH-LMDZ608v6Wb3P05



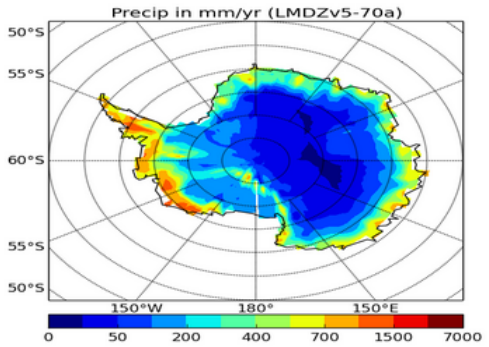
precipSH-LMDZv5-4



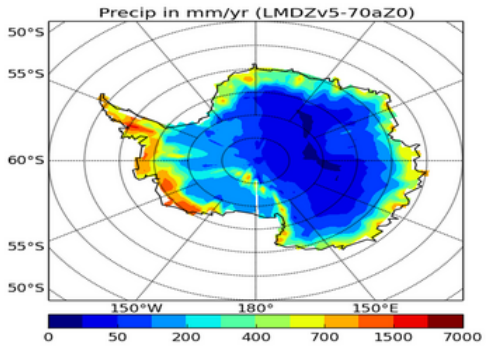
precipSH-LMDZv5-5



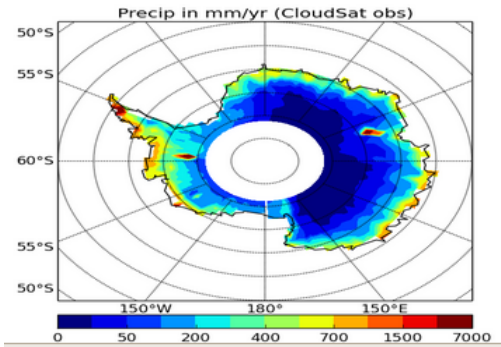
precipSH-LMDZv5-70a



precipSH-LMDZv5-70aZ0



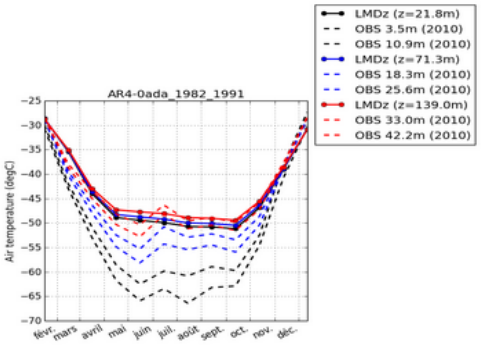
precipSH-OBS



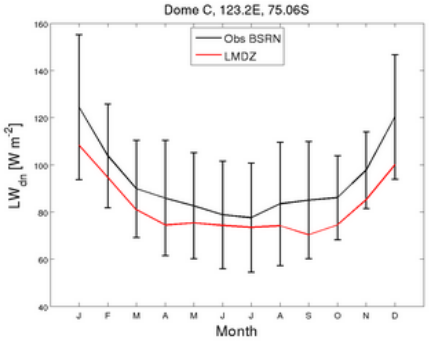
Axe 4 : Climats polaires
Cycles saisonniers au Dome C (2/2)

Tz1 dome C PDF

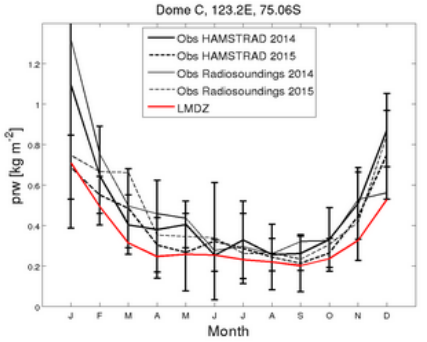
tempDC-AR4-0ada_1982_1991



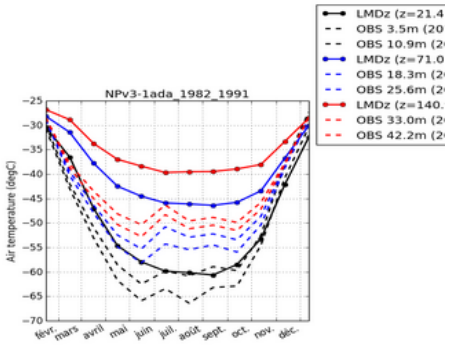
LWdnSFC_DC_AR4.0ada_1982_1991



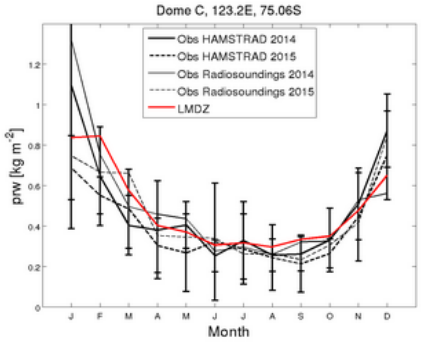
prw_DC_AR4.0ada_1982_1991



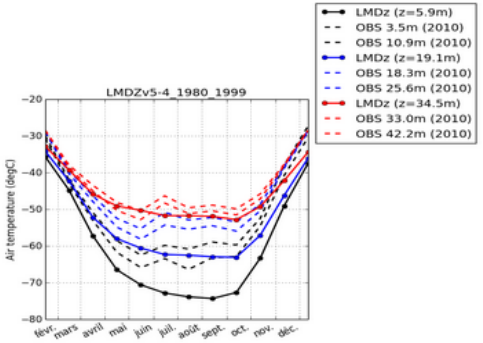
tempDC-NPv3-1ada_1982_1991



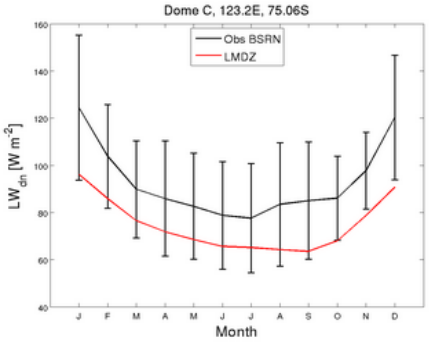
prw_DC_NPv3.1ada_1982_1991



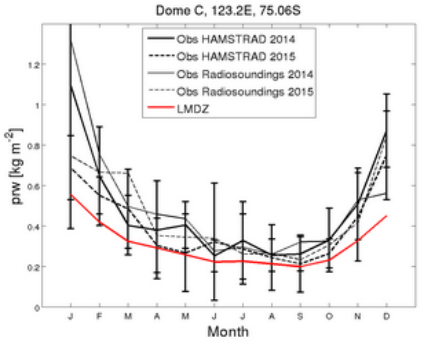
tempDC-LMDZv5-4_1980_1999



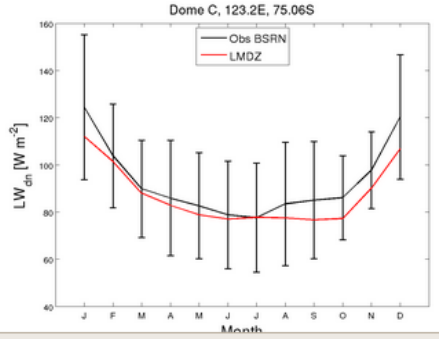
LWdnSFC_DC_LMDZv5.4_1980_1999



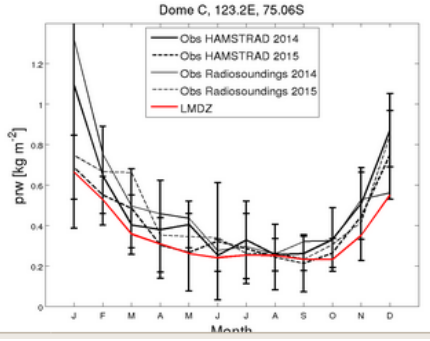
prw_DC_LMDZv5.4_1980_1999



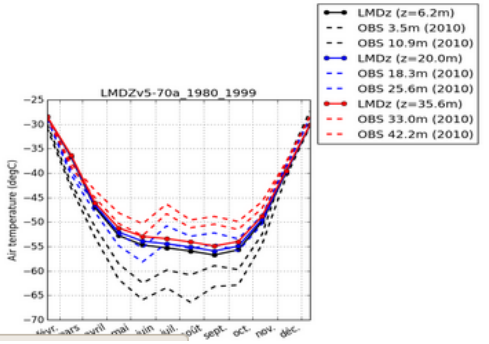
LWdnSFC_DC_LMDZv5.5_1980_1999



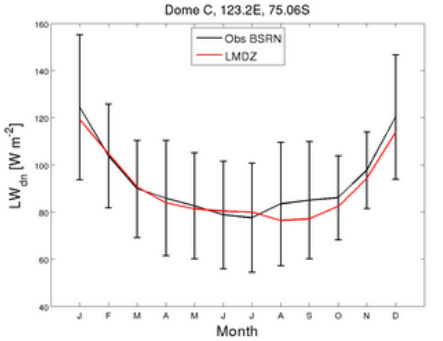
prw_DC_LMDZv5.5_1980_1999



tempDC-LMDZv5-70a_1980_1999

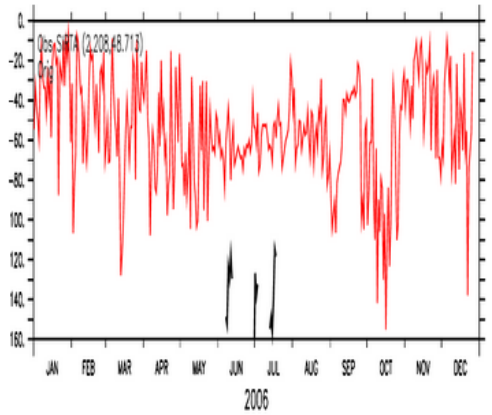


LWdnSFC_DC_LMDZv5.70a_1980_1999

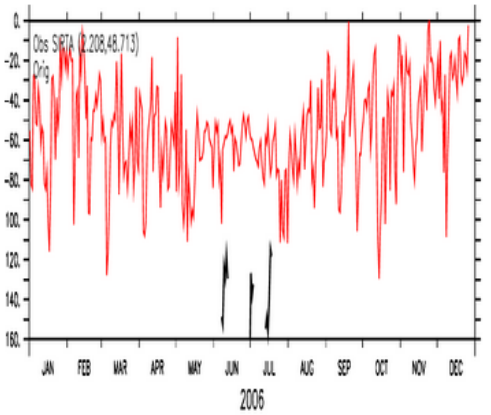


Axe 7 : Comparaison aux “stations” (AMMA/SIRTA ou bouées) (1/2)

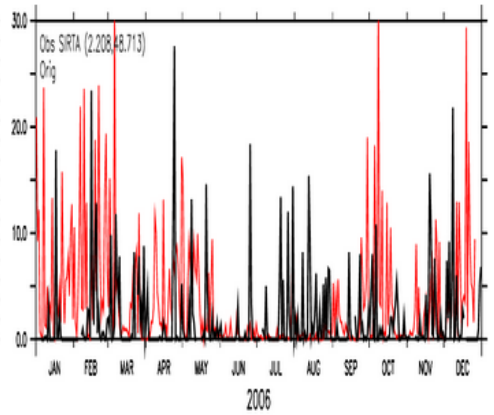
flat_SIRTA_FHXVLR10NPv6.0.9_2006



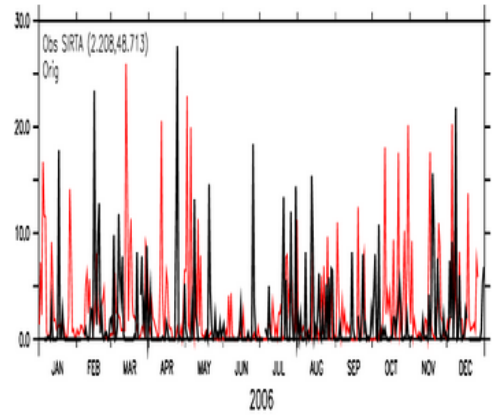
flat_SIRTA_FHXVLR10NPv6.0.10blcv_2006



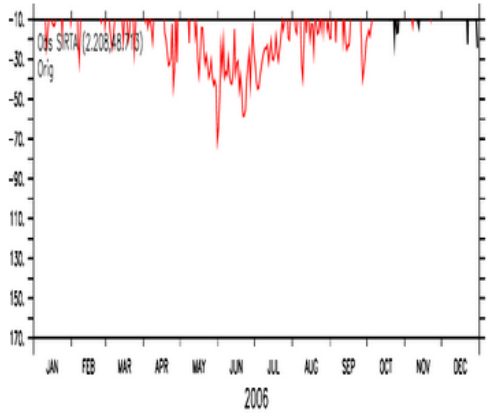
precip_SIRTA_FHXVLR10NPv6.0.9_2006



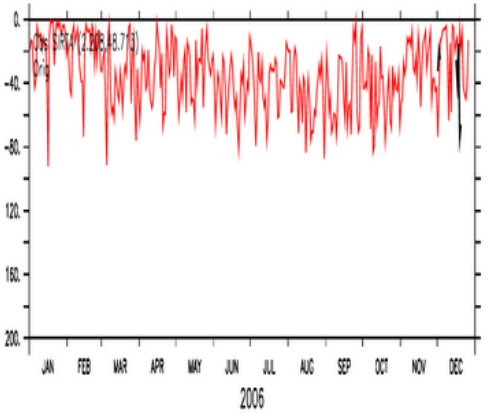
precip_SIRTA_FHXVLR10NPv6.0.10blcv_2006



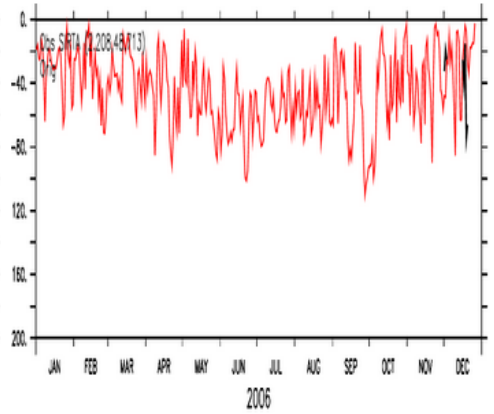
sens_SIRTA_FHXVLR10NPv6.0.10blcv_2006



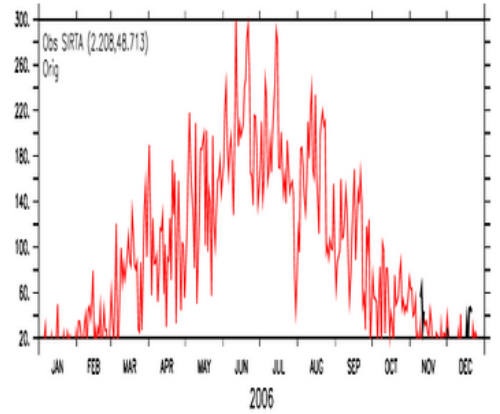
soll_SIRTA_FHXVLR10NPv6.0.9_2006



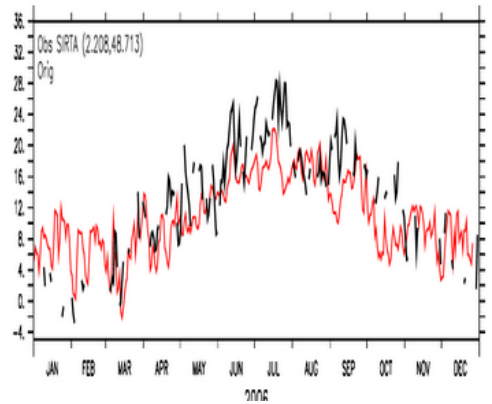
soll_SIRTA_FHXVLR10NPv6.0.10blcv_2006



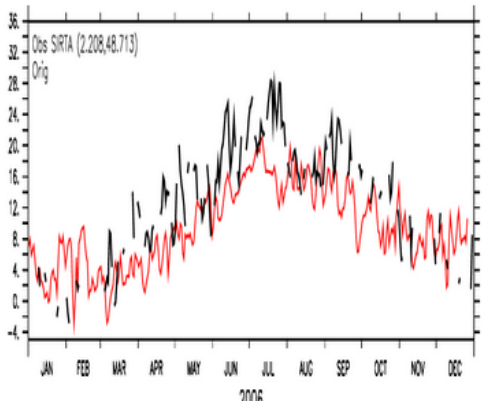
sols_SIRTA_FHXVLR10NPv6.0.9_2006



t2m_SIRTA_FHXVLR10NPv6.0.9_2006



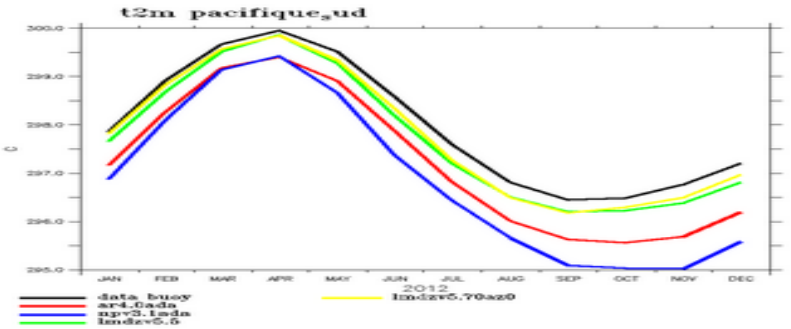
t2m_SIRTA_FHXVLR10NPv6.0.10blcv_2006



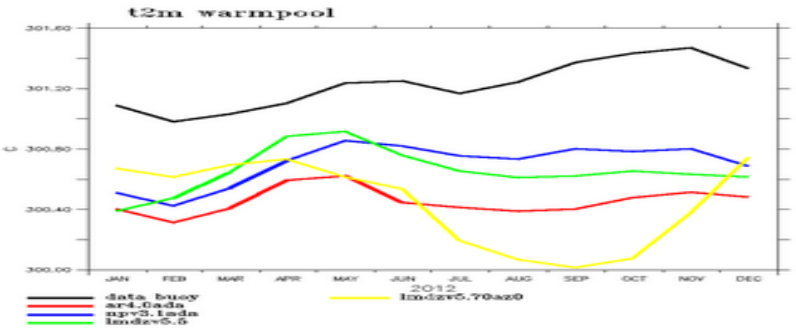
Ionela Musat, Journées LMDZ, 12 juin 2018

Axe 7 : Comparaison aux “stations” (AMMA/SIRTA ou bouées) (2/2)

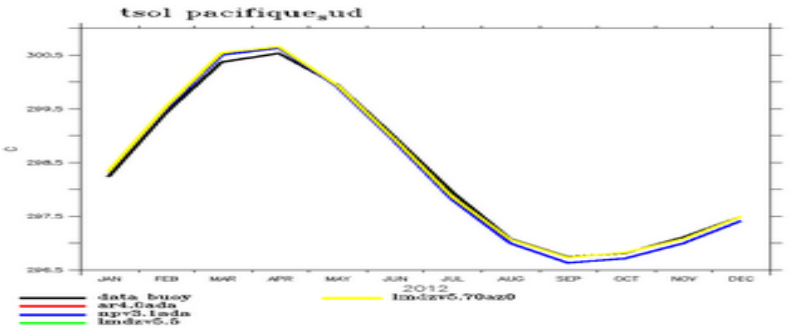
t2m_pacifique_sud



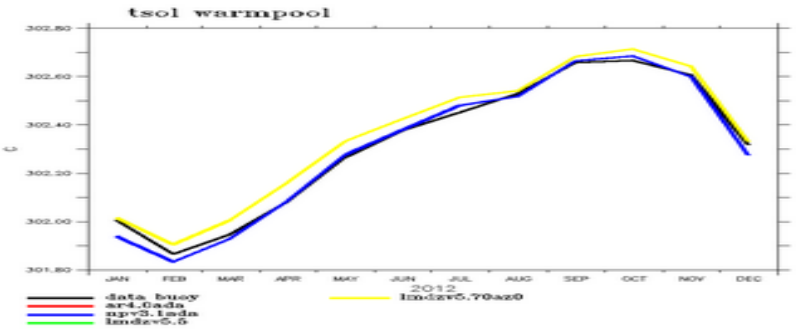
t2m_warmpool



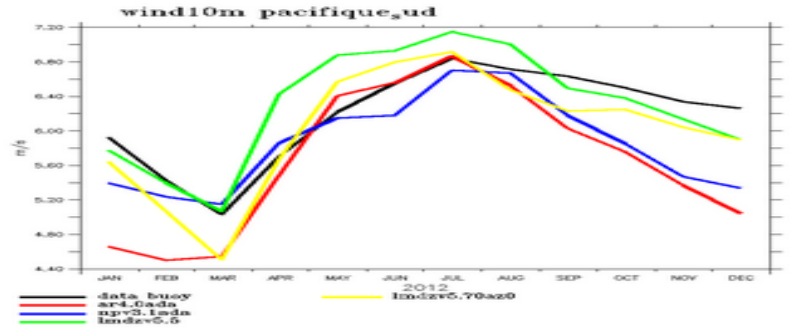
tsol_pacifique_sud



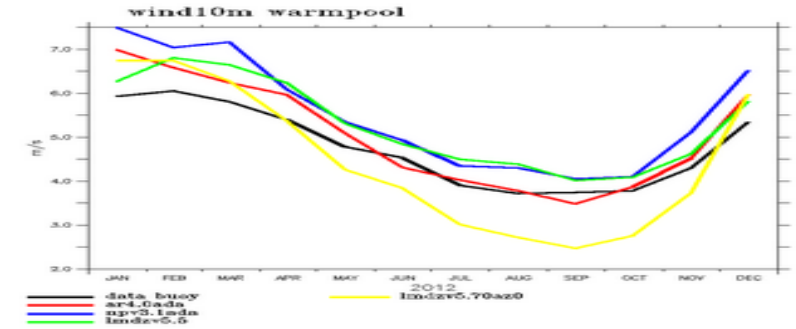
tsol_warmpool



wind10m_pacifique_sud



wind10m_warmpool



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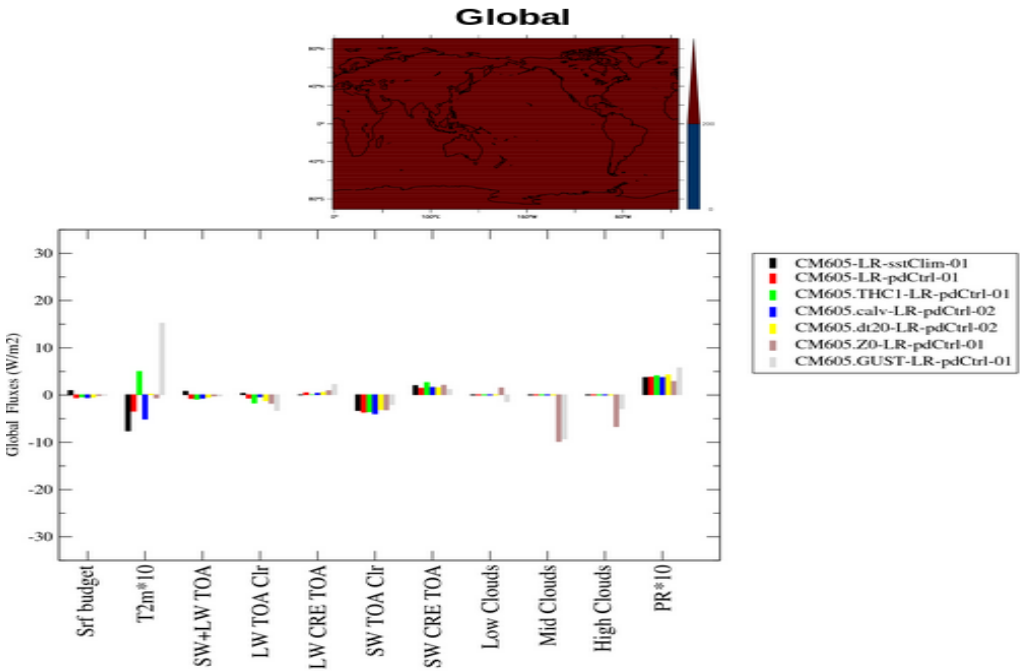
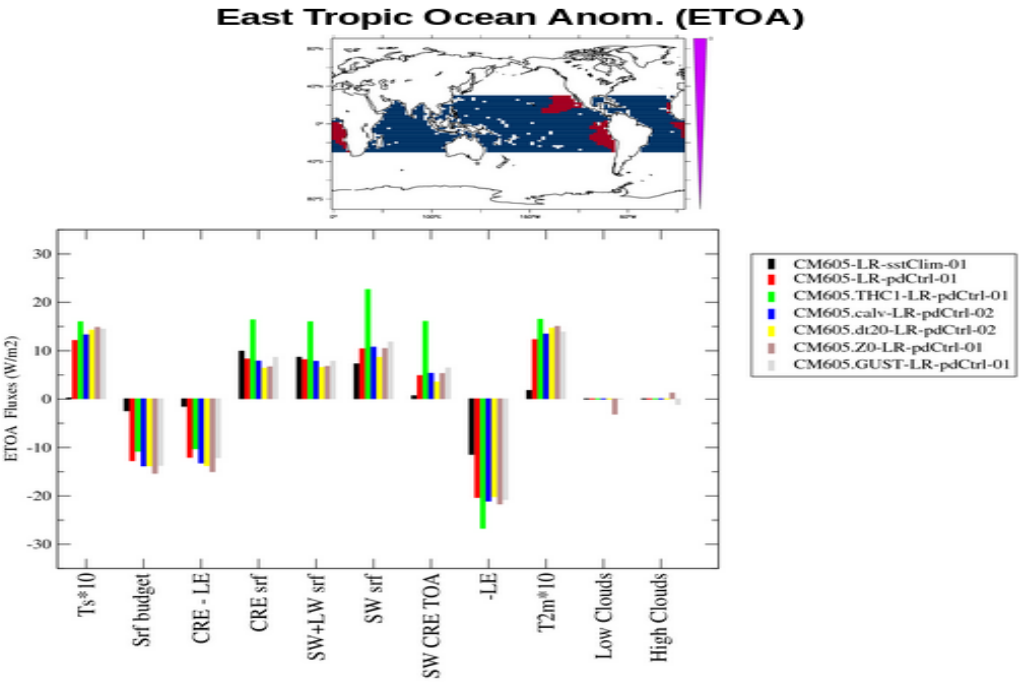
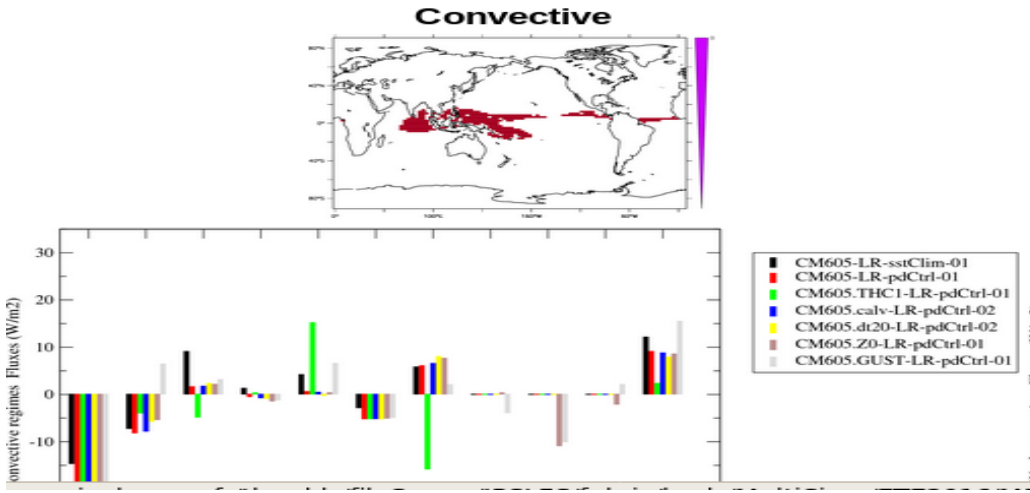
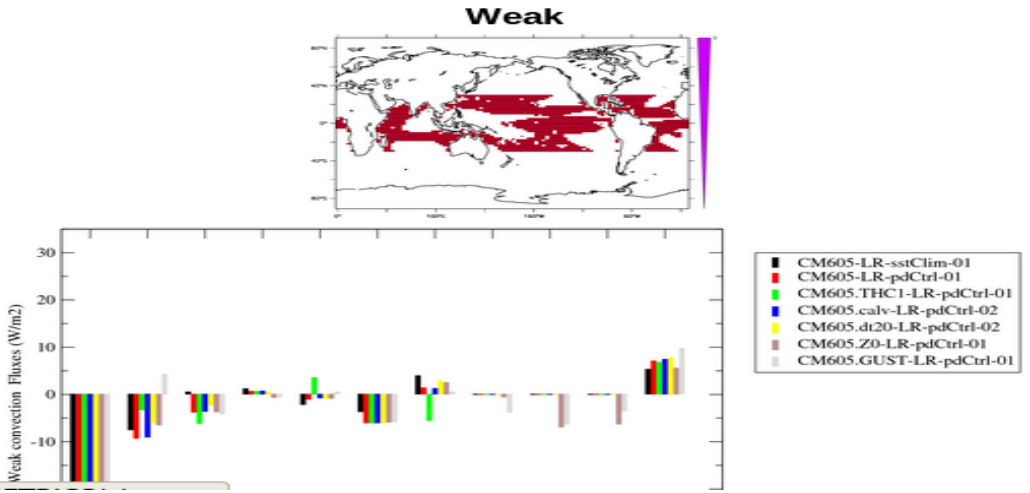
METRICS Tuning :
metriques moyennes ou biais (rouge – bleu) masques au dessus









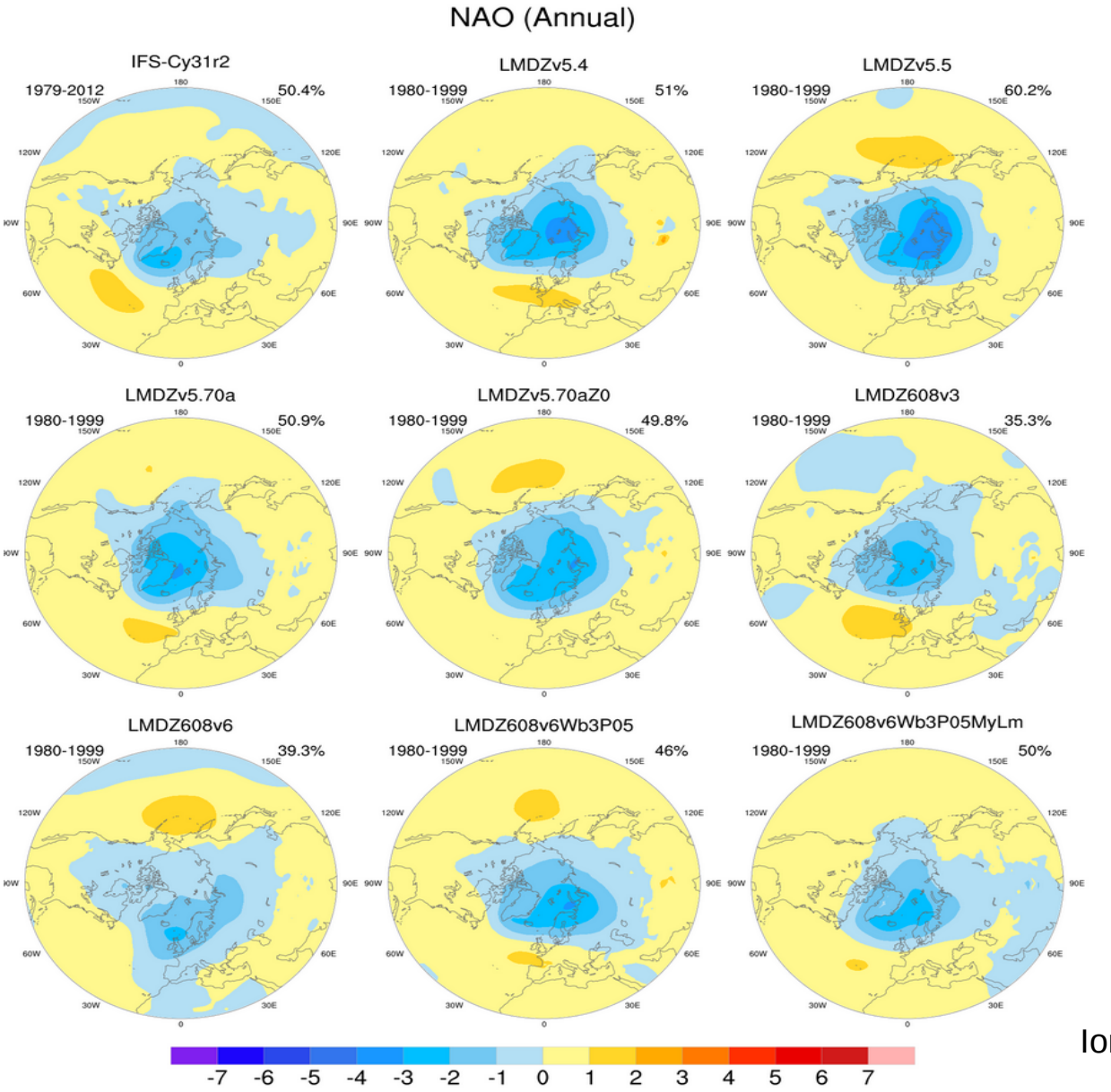
METRICS : PCMDI metrics (J.Servonnat)

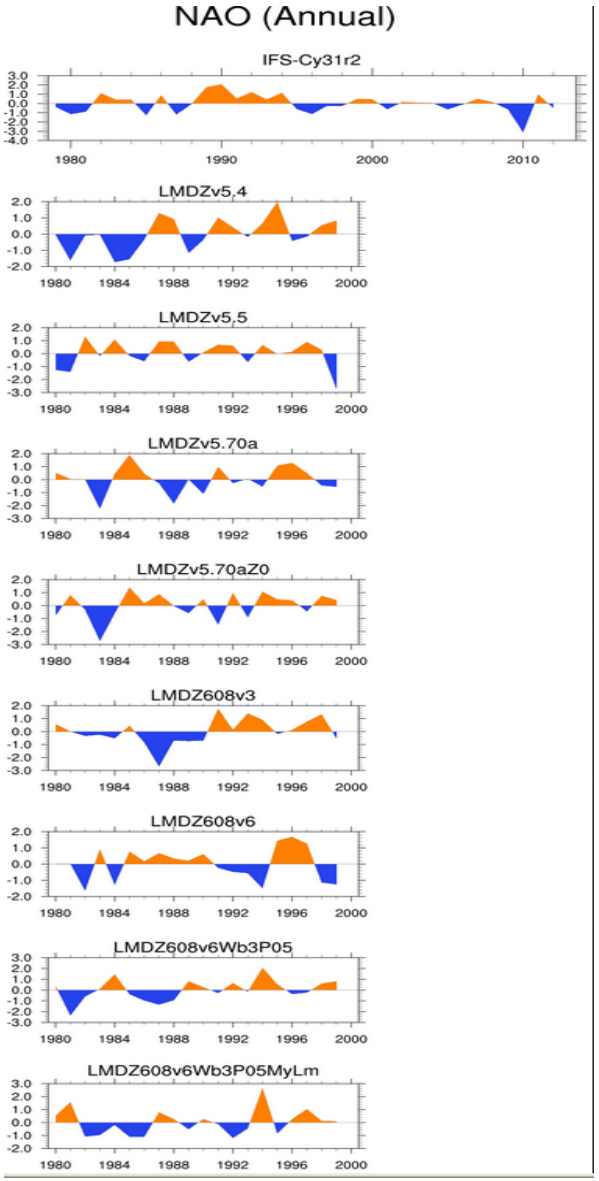
Metriques, reference CMIP5_historical , rms_xyt

			rms_xyt_ann_GLB																					Mean
		variable	pr			prw			psl			rlut	rlutcs	rsut	rsutcs	tas			uas			vas			
		referenceName	GPCP			RSS			ERAINT			CERES	CERES	CERES	CERES	ERAINT			ERAINT			ERAINT			
		maskingRegion	global	land	ocean	global	land	ocean	global	land	ocean	global	global	global	global	global	land	ocean	global	land	ocean	global	land	ocean	
simulationModel	simulationName	simulationPeriod																							
IPSLCM6	CM605-LR-pdCtrl-01	2060_2069	+4.32	-7.78	-6.78	+0.91	-13.75	-9.79	+4.67	+34.23	-8.72	-4.03	-11.69	-9.49	-0.91	+0.94	+9.40	-0.86	-6.30	-21.75	-2.55	-9.27	-14.23	-8.16	-3.71
		2070_2079	+6.21	-6.01	-4.15	+1.41	-13.63	-7.38	+5.83	+37.55	-10.13	-1.05	-10.32	-8.30	+0.15	+1.21	+9.93	-1.11	-5.57	-19.45	-2.85	-7.12	-12.09	-6.01	-2.40
	CM605-LR-sstClim-01	2060_2069	+4.31	-6.62	-29.46	+2.63	-11.64	-27.49	+6.24	+40.20	-15.14	-15.69	-30.11	-14.96	-14.90	-25.38	+3.65	-53.61	-10.97	-21.70	-9.93	-18.53	-15.34	-24.16	-13.12
		2070_2079	+3.27	-7.56	-30.12	+2.32	-11.97	-27.73	+10.52	+46.42	-11.77	-15.63	-30.67	-14.85	-15.52	-25.91	+2.35	-52.28	-9.81	-22.44	-7.67	-18.32	-16.22	-23.44	-12.59
	CM605.GUST-LR-pdCtrl-01	2060_2069	+19.70	+4.17	+12.49	+23.28	+1.00	+66.32	+5.98	+28.92	-4.88	+14.49	+8.61	-1.12	+15.09	+43.89	+31.86	+52.94	-9.81	-18.70	-9.27	-6.82	-12.38	-6.12	+11.80
		2070_2079	+18.42	+1.75	+11.32	+23.28	+0.99	+66.92	+8.30	+34.34	-1.59	+13.83	+9.85	-1.03	+17.69	+46.83	+33.23	+57.33	-2.90	-19.18	+0.59	-6.18	-11.60	-4.76	+13.52
	CM605.THC1-LR-pdCtrl-01	2060_2069	+11.34	+16.58	-11.65	+9.57	-7.76	+18.03	+10.85	+43.38	-2.12	+15.03	-8.85	+13.66	+1.30	+2.45	+4.44	+7.64	-3.86	-20.22	+0.39	-4.98	-9.84	-3.87	+3.71
		2070_2079	+9.99	+16.45	-14.51	+10.08	-7.25	+16.57	+9.24	+43.54	-6.35	+14.62	-9.08	+14.06	+1.01	+1.77	+7.45	+3.82	-3.35	-18.49	+0.42	-6.28	-7.52	-7.08	+3.14
	CM605.Z0-LR-pdCtrl-01	2060_2069	+8.99	-2.29	-4.55	+0.07	-14.74	-7.54	+18.71	+57.43	-2.75	-1.16	-3.57	-5.55	+10.09	+10.59	+15.14	+12.76	+1.12	-16.07	+4.39	-5.46	-8.43	-6.30	+2.77
		2070_2079	+6.08	-3.67	-7.09	+0.42	-14.28	-9.20	+11.96	+48.37	-8.88	-4.78	-4.42	-6.54	+10.86	+11.03	+14.97	+14.45	-2.76	-16.81	-1.20	-7.36	-9.40	-8.73	+0.59
	CM605.calv-LR-pdCtrl-02	2060_2069	+3.95	-5.65	-6.74	+0.52	-14.15	-8.02	+8.52	+42.39	-10.80	-3.97	-15.49	-10.34	-3.75	-7.95	+8.83	-16.77	-8.62	-19.89	-7.16	-8.85	-13.17	-8.52	-4.80
		2070_2079	+4.93	-4.58	-6.32	+0.55	-14.12	-8.94	+3.40	+31.72	-9.62	-4.83	-15.21	-10.47	-2.54	-6.64	+10.48	-16.13	-9.35	-20.77	-7.38	-9.55	-12.92	-8.90	-5.33
	CM605.dt20-LR-pdCtrl-02	2060_2069	+6.58	+0.75	-2.50	+0.63	-14.54	-4.67	+14.62	+30.60	+11.01	+1.81	-7.01	-4.75	+0.15	+7.50	+10.19	+9.71	-5.24	-19.68	-3.23	-7.19	-14.12	-6.61	+0.18
ACCESS1-0	r1i1p1	--	+6.76			-3.70			-23.64			-10.80	-22.08	-24.50	-31.90	-14.34			-25.80			-18.80			-16.88
ACCESS1-3	r1i1p1	--	+12.33			+0.73			-19.44			-0.90	-6.42	-13.23	-9.85	-14.34			-16.35			-14.08			-8.16
BNU-ESM	r1i1p1	--	-9.02			+4.58			+8.14			-7.15	-1.58	-4.05	+33.59	+14.92			+21.48			+10.47			+7.14
CCSM4	r1i1p1	--	-10.41	-21.77	-9.57	+5.30	+4.34	-3.96	-5.19	+0.43	-11.50	-10.95	-28.05	-7.90	+1.18	-12.62	-16.28	-10.00							-8.56
CESM1-BGC	r1i1p1	--	-7.16			+5.30			-4.50			-8.13	-28.92	-6.18	-2.54	-15.21									-8.42
CESM1-CAM5	r1i1p1	--	-12.27			+2.08			-34.65			-18.03	+1.90	-15.92	-12.68	-8.75									-12.29
CESM1-CAM5-1-FV2	r1i1p1	--										-3.34													-3.34
CESM1-FASTCHEM	r1i1p1	--	-9.02			+5.87			-0.44			-8.97	-28.54	-6.33	+0.51	-14.77									-7.71
CESM1-WACCM	r1i1p1	--	-11.34			+9.01			+7.56			+5.72	-26.18	+4.02	-6.72	-4.44									-2.80
CMCC-CESM	r1i1p1	--	+6.30			+11.59			+9.52			+21.62	+22.78	+21.33	+15.41	+20.52			+12.02			+6.69			+14.78
CMCC-CM	r1i1p1	--	+3.98	+9.27	+7.61	+6.59	+5.26	-7.10	-34.04	-40.00	-29.16	-8.74	-3.94	-5.01		+8.90	+31.40	+0.31	-23.62	-38.41	-19.07	-20.69	-33.16	-15.13	-9.75
CMCC-CMS	r1i1p1	--	-3.91			+8.73			-26.66			-5.62	-5.68	-4.20		-4.01			-15.62			-17.86			-8.31
CNRM-CM5	r1i1p1	--	-15.98	-14.54	-17.71	-6.63	-7.21	-0.83	-36.14	-35.32	-28.85	-10.65	-1.70	+8.69	+9.53	+2.01	-3.18	-5.12	-18.53	-36.70	-15.61	-21.63	-33.16	-23.62	-14.22
CSIRO-Mk3-6-0	r1i1p1	--	+25.79	-6.04	+34.29	+0.80	+8.32	-0.83	+10.54	+23.33	+11.09	+5.34	-11.27	+15.24	+34.11	+32.14	+45.59	+28.50	+4.75	+5.21	+2.37	+14.25	+19.16	+15.99	+14.49

ESMVal : Climate Variability Diagnostic Package
(N. Kadygrov)

- moyennes, écart-types, modes de variabilité couplée (AMO, PDO,ENSO), atmosphérique (NAM, SAM, NAO, PNA, etc) et océanique (AMOC), etc





Ionela Musat, Journées LMDZ, 12 juin 2018

De l'avenir du multi-atlas “LMDZ patchwork” vs “CliMAF ESMEP” ou autre (1/2)

Quels diagnostics ajouter, intégrer dans les “multi-atlas LMDZ patchwork”

- cartes biais vs. sim. réf, diag. MJO Clivar, proj. polaires, nouv. champs
- travailler sur l'intégration des diagnostics ESMval et des métriques PCMDI dans notre moulinette (?)

LA question : capitaliser OU passer à tout CliMAF OU repartir à 0 (python, R,...) ?

Atouts du “multi-atlas LMDZ patchwork”

- il existe et est “facile” d'utilisation : * 1 fichier (“runs.txt”) à compléter avec les simulations à comparer
  * 2 fichiers (def.txt, atlas.def) à créer
  * 1 script principal (job_multi.sh) à lancer
- il est facile à enrichir <==> fournir un script (bash + ferret/grads/matlab/python,..) produisant un graphe
- pas de contraintes sur le langage/logiciel à utiliser

Atouts du multi-atlas “CliMAF ESMEP”

- il existe ; facile d'utilisation (?)
- les ++ : TS, “métriques tuning” (RMS annual mean, annual cycle SST), proj. polaires, diag. ENSO Clivar/mousson,..

De l'avenir du multi-atlas “LMDZ patchwork” vs “CliMAF ESMEP” ou autre (2/2)

Les points bloquants pour passer à un autre “logiciel-cible” (CliMAF, python, R, ..?) :

- le manque de savoir-faire et connaissances sur les fonctionnement/potentialités de CliMAF, python, etc
- la perte de temps pour interfacer le langage-diagnostic au logiciel-cible
- comment ça marche ? (Les étapes pour ajouter, intégrer, développer nouveaux diagnostics ?)

Les multi-atlas CliMAF ESMEP de Jérôme Servonnat

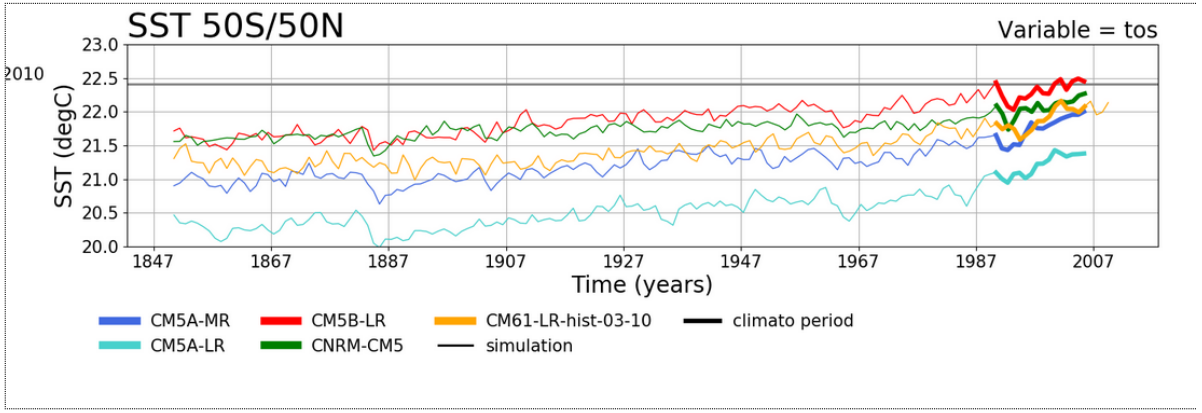
Comparison setup: Journees_LMDz_Juin_2018_historical

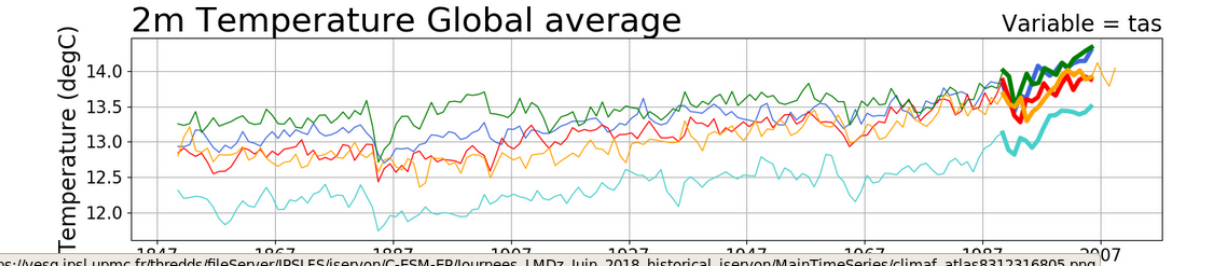
- IGCM meetings main time series
- Metrics for model tuning
- Parallel Coordinates - PMP PCMDI
- Atmosphere Surface - seasonal
- NH Polar St. - Atmosphere Surface
- SH Polar St. - Atmosphere Surface
- Atmosphere Standard press. lev. - seasonal
- NH Polar St. - Atmosphere Standard press. lev.
- SH Polar St. - Atmosphere Standard press. lev.
- Atmosphere Zonal mean - seasonal
- NEMO - general diagnostics
- NEMO - T & S @depth
- NEMO zonal means
- PISCES
- ENSO CLIVAR Diagnostics
- ORCHIDEE
- Turbulent Air-Sea Fluxes (GB2015)
- Monsoons Diagnostics

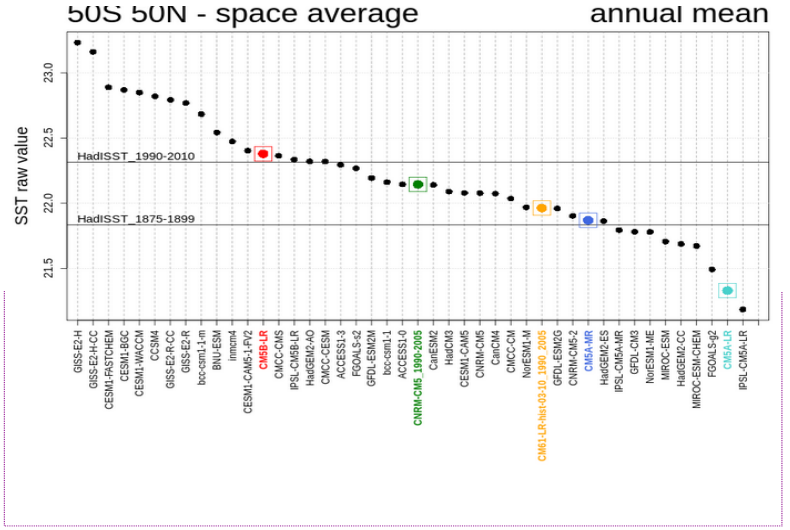
CliMAF : TS SST, T2m des runs couplés CMIP5, CMIP6 & “Metrics for model tuning” de J. Servonnat (1/6)

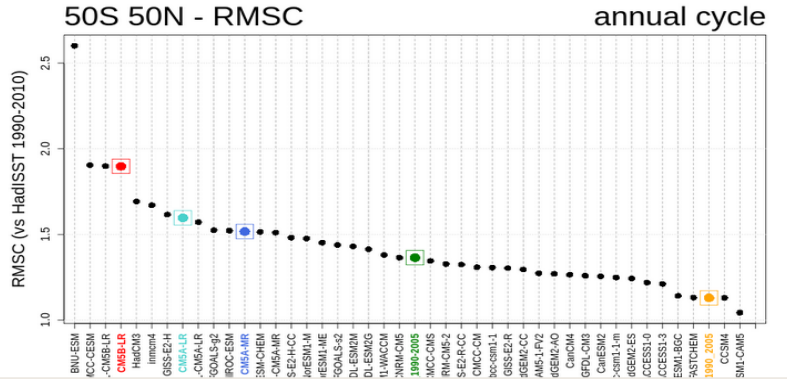
IGCM meetings main time series

Main Time Series







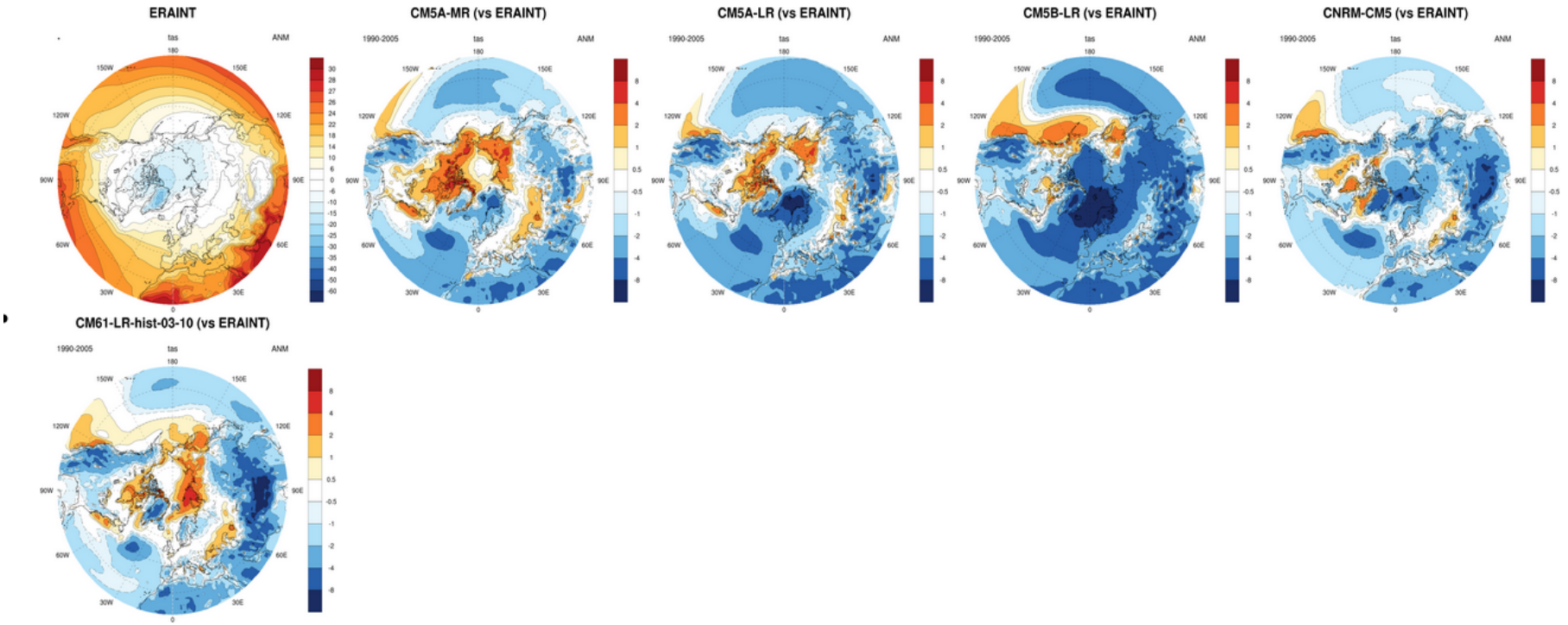


Proj. st. polaires par CliMAF de J. Servonnat (2/6)

NH Polar St. - Atmosphere Surface

Atmosphere

2M Temperature (tas) ; season = ANM ; REF = ERAINT

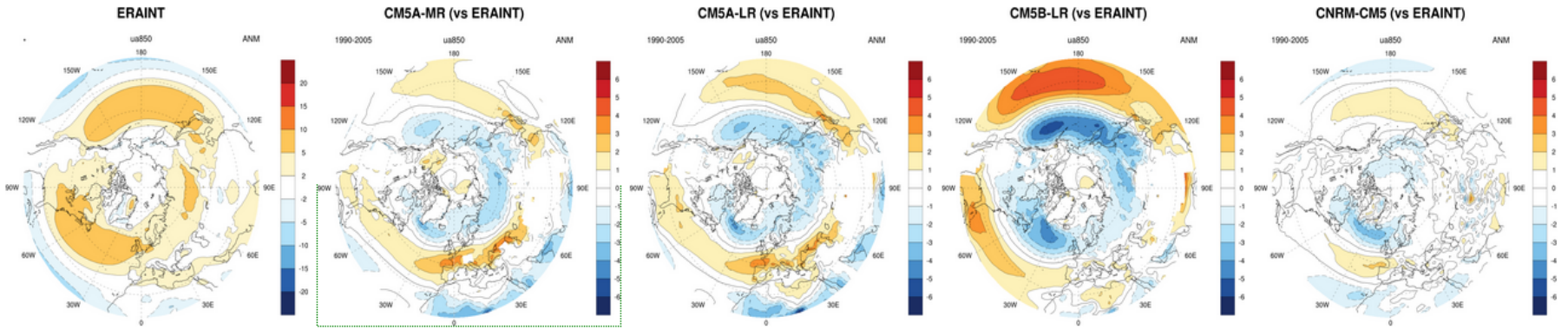


Proj. st. polaires aux niveaux pressions par CliMAF de J. Servonnat (3/6)

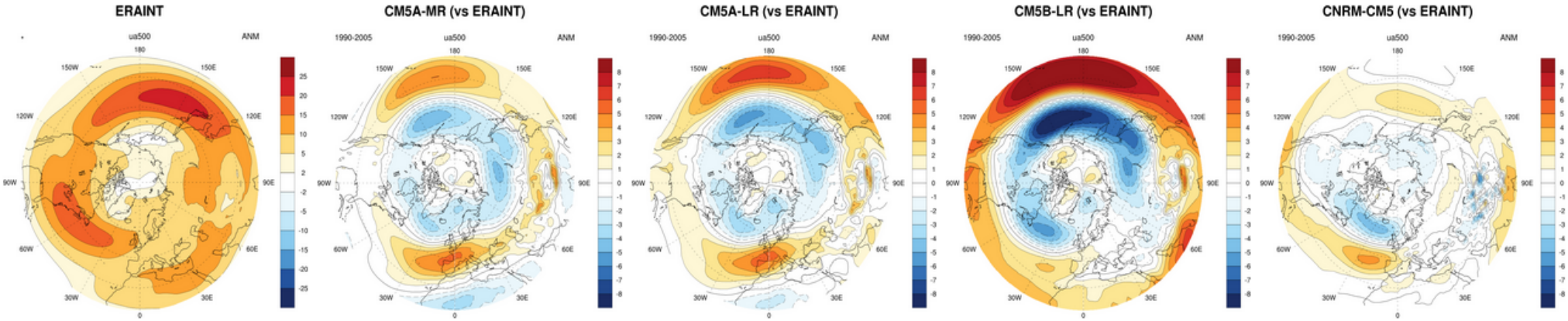
NH Polar St. - Atmosphere Standard press. lev.

Atmosphere

- **Zonal Wind at 850mb (ua850) ; season = ANM ; REF = ERAINT**



- **Zonal Wind at 500mb (ua500) ; season = ANM ; REF = ERAINT**

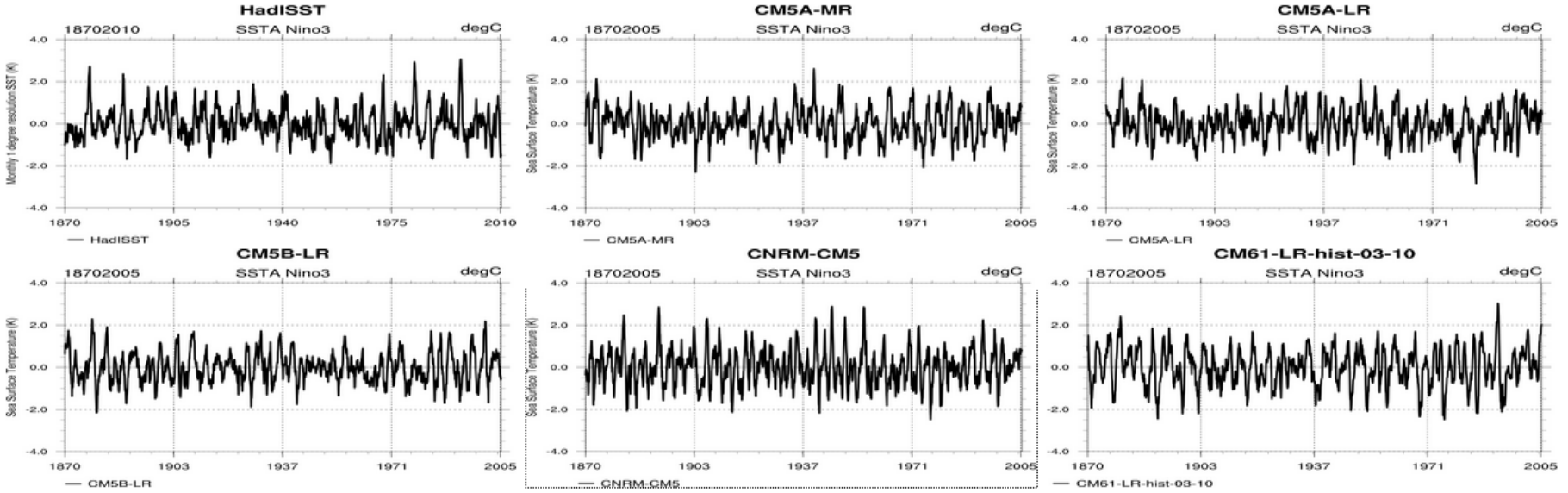


Diag. ENSO Clivar dans CliMAF de J. Servonnat (4/6)

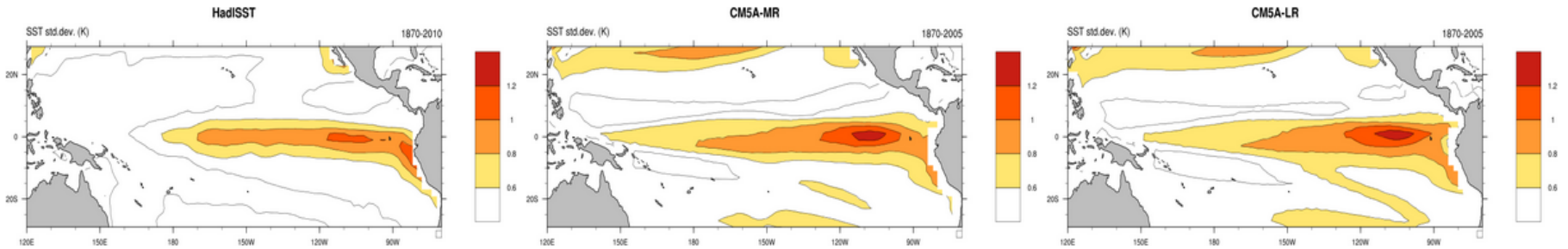
ENSO CLIVAR Diagnostics

ENSO - CLIVAR diagnostics

- **Time Series of Nino3 SST anomalies (departures from annual cycle)**



- **Standard Deviation of SST anomalies (deviations from annual cycle)**

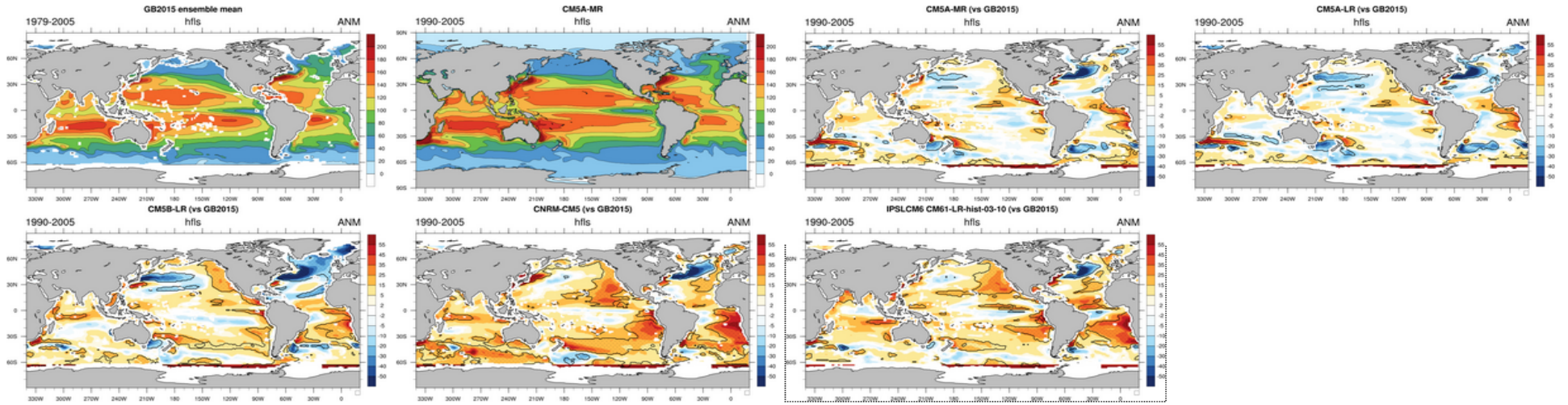


New flux air-mer par CliMAF de J. Servonnat (5/6)

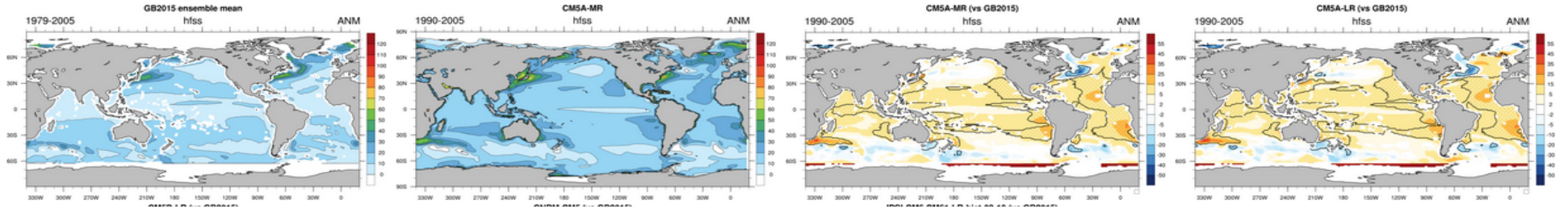
Turbulent Air-Sea Fluxes (GB2015)

Turbulent Fluxes Annual Mean

- **GLOBAL Annual Mean Latent Heat Flux (hfls)**



- **GLOBAL Annual Mean Sensible Heat Flux (hfss)**

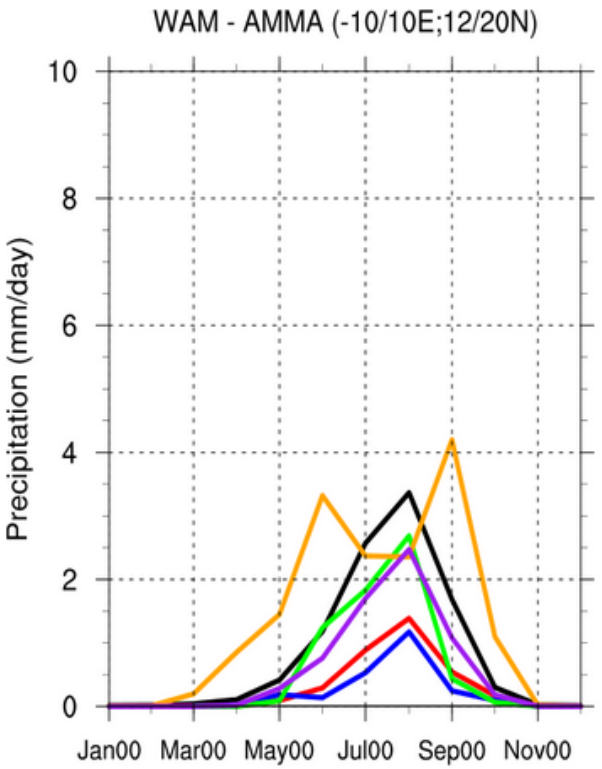


Les ind. moussons Afr. et Ind. par CliMAF de J. Servonnat (6/6)

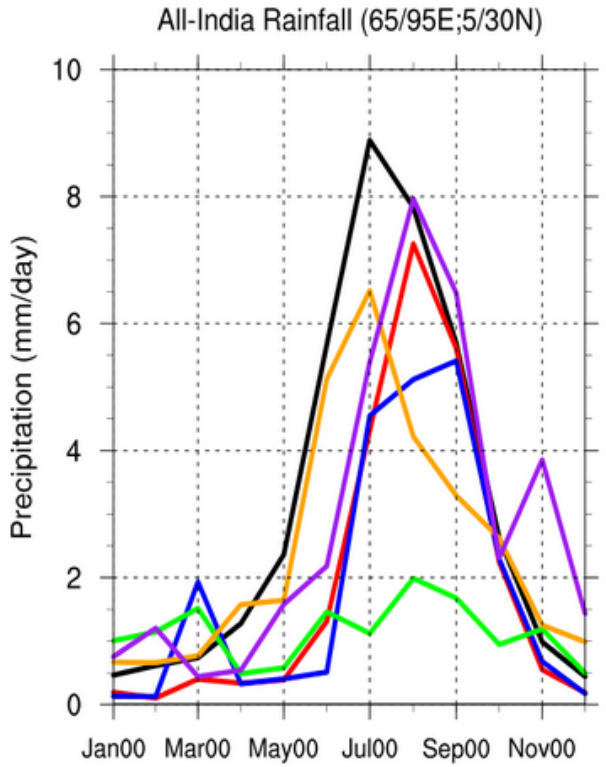
Monsoons - precipitation annual cycles diagnostics

GPCP — CNRM-CM5

- **WAM - AMMA (-10/10E;12/20N)**



- **All-India Rainfall (65/95E;5/30N)**



Le multi-atlas “LMDZ patchwork” en 4 pas !

1/ copier/rendre visibles (curie) vos fichiers “SE” sur ciclad

2/ ajouter vos simulations et leur $Path dans ~/LMDZ/MultiSimu/runs.txt

MaSimul $Path/MaSimul

LMDZOR14httop /ccc/store/cont003/thredds/.../LMDZOR14httop

3/ créer votre répertoire de comparaison MyCompa

cd /prodigfs/ipslfs/dods/fabric/lmdz/MultiSimu

mkdir -p /prodigfs/ipslfs/dods/fabric/lmdz/MultiSimu/MyCompa

contenant 2 fichiers : def.txt (liste des simulations) et atlas.def (la liste des variables cmor-isées pour avoir les cartes)

more MyCompa/def.txt

```
v3.historical1  1990_1999   IPSL-CM5A-LR
CM61-LR-hist-03-10  1990_1999   IPSL-CM6A-LR
```

more MyCompa/atlas.def

```
YEAR GLOB pr,tas,hurs,hfls,hfss,albt,crest,crelt,crett,psl,ua,va,ta,tauu,tauv
DJF GLOB pr,tas,ua
```

4/ lancer la multi-comparaison : ~/LMDZ/MultiSimu/job_multi.sh My_compa