

Briefing mensuel

Suivi MJO et ondes équatoriales pour le bassin SOOI

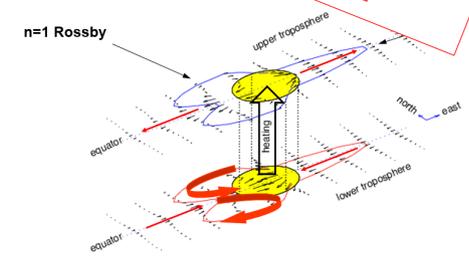
DATE : 30/03/2023

S. Langlade, L. Carré, E. Kapikian, H. Vérèmes, P. Peyrillé et F. Bonnardot

support produit le 28/03/2023
sur bulletin ECMWF du 27/03
et figures du 27/03

S1 : 27 mars-02 avril
S2 : 03 avril-09 avril
S3 : 10 avril-16 avril
S4 : 17 avril-23 avril
S5 : 24 avril-30 avril

ATTENTION :
Changement de
formalisme des
semaines !!!!
S0 est devenu S1 mais
correspond toujours à la
semaine en cours.



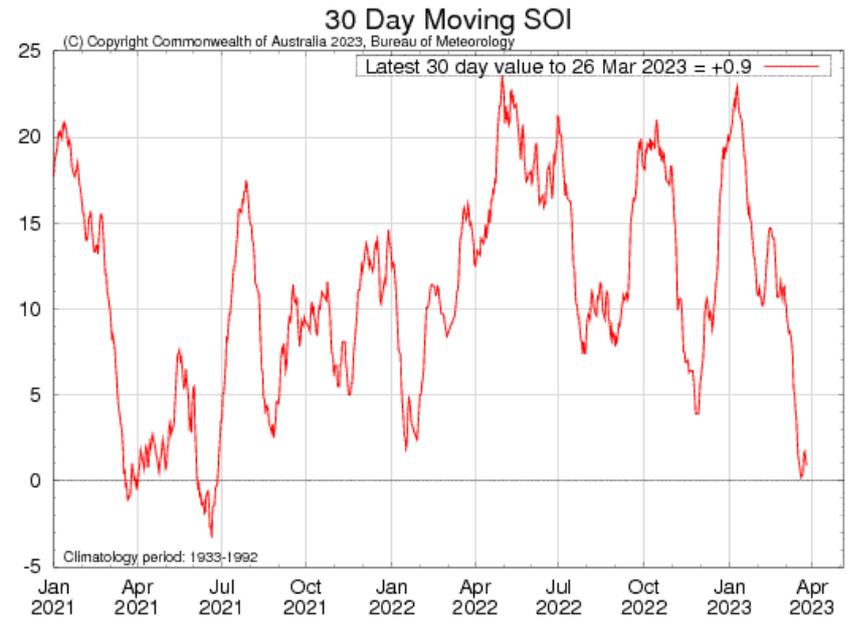
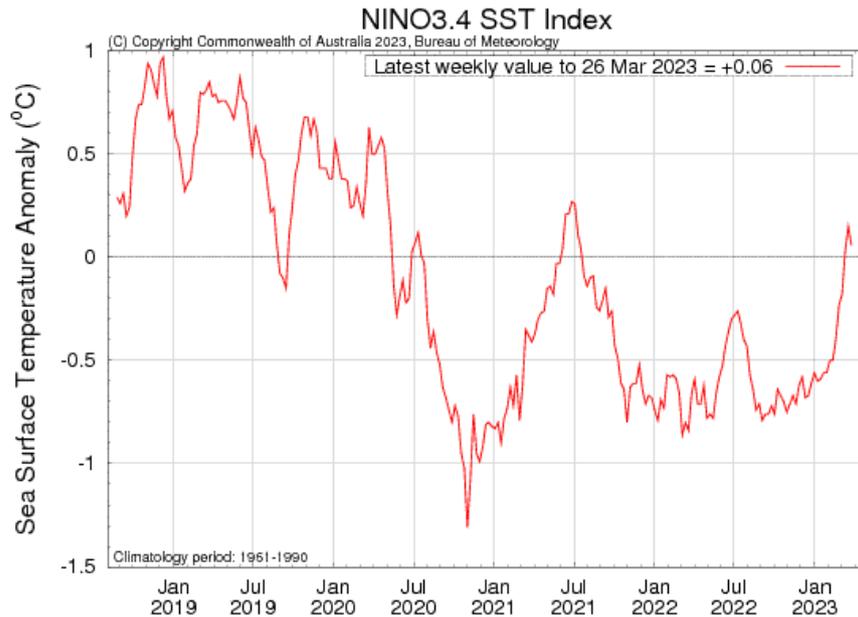
Matsuno, 1966
Webster, 1972
Gill, 1980

INTRODUCTION

1. Prévision - Basse fréquence

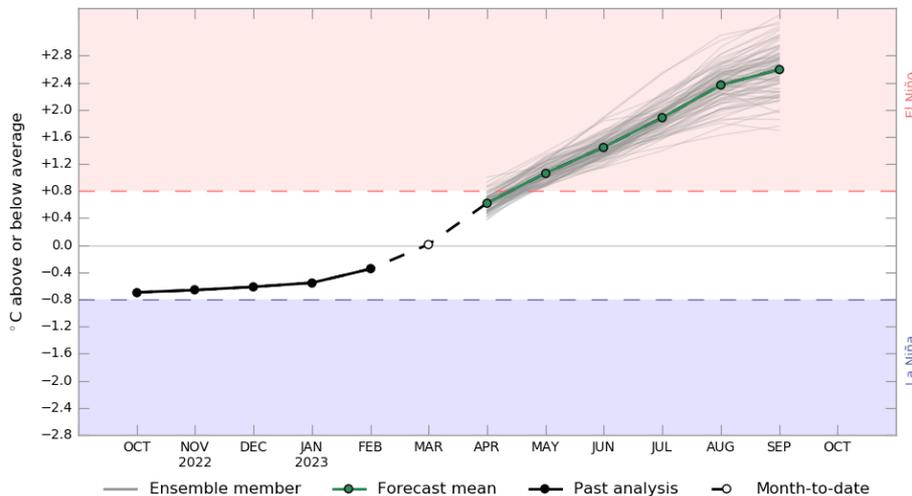
Signal Basse Fréquence

Contexte ENSO



Prévision ENSO

Monthly sea surface temperature anomalies for NINO3.4 region

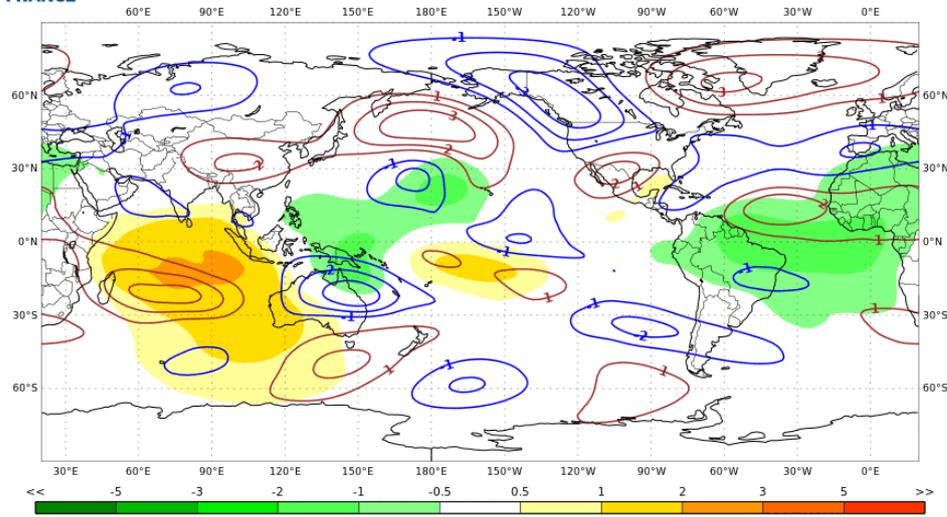


Signal Basse Fréquence

VP 200 prévu



Meteo-France system 8 - Forecast
For MAM 2023 (issued March 2023)

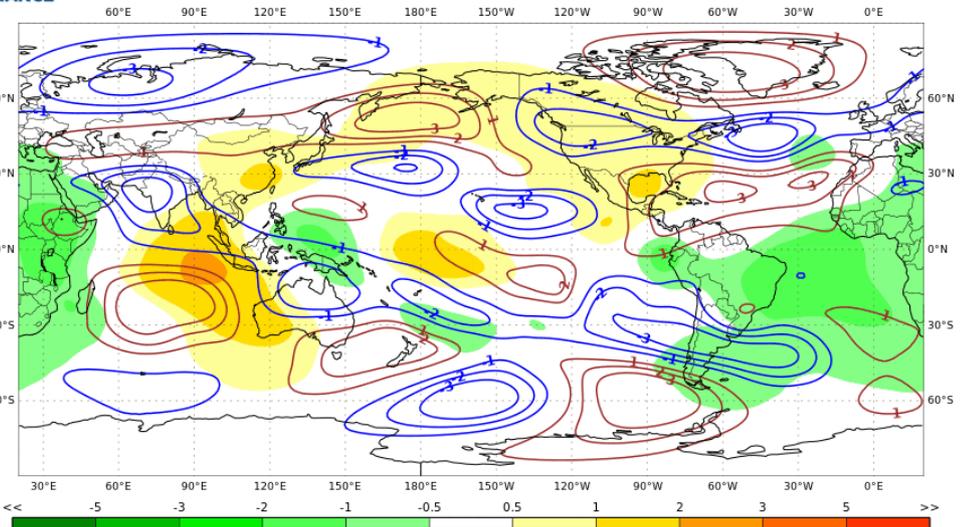


200hPa velocity potential and 200hPa streamfunction - zonal mean
3-months ensemble mean anomaly

unit : km2/s



ECMWF SEAS5 - Forecast
For MAM 2023 (issued March 2023)



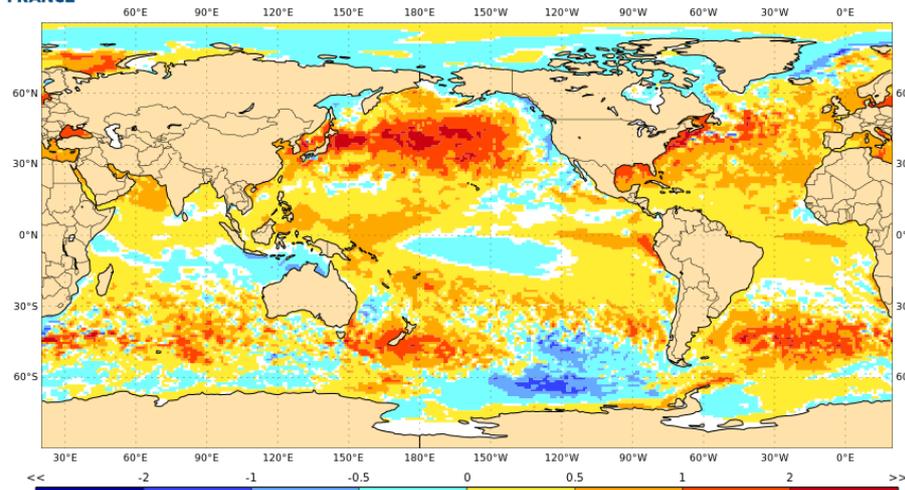
200hPa velocity potential and 200hPa streamfunction - zonal mean
3-months ensemble mean anomaly

unit : km2/s

SST prévue



Meteo-France system 8 - Forecast
For MAM 2023 (issued March 2023)

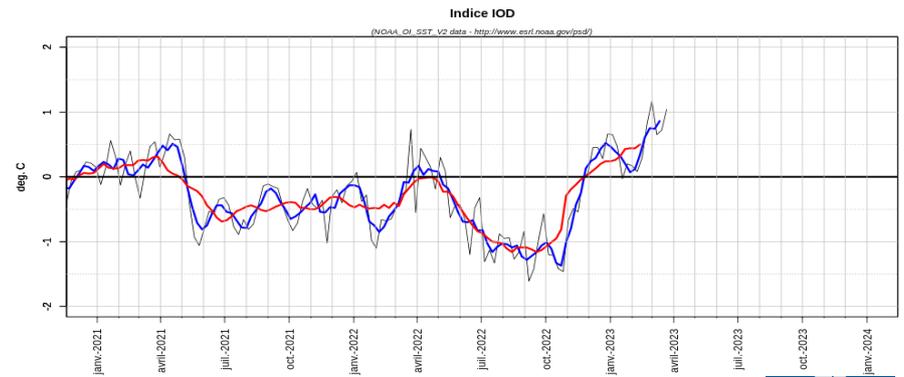
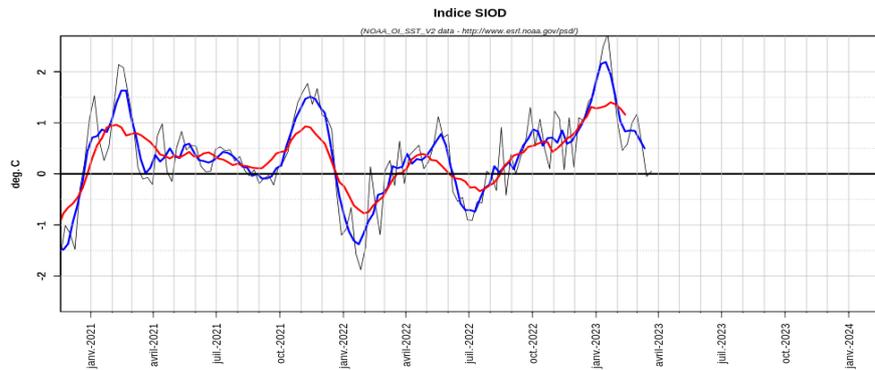
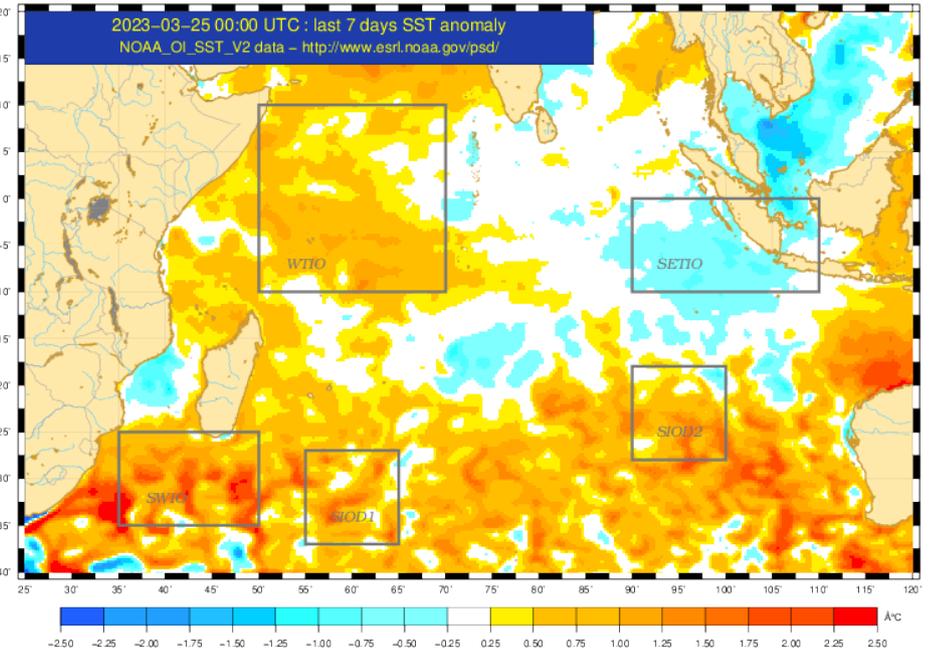
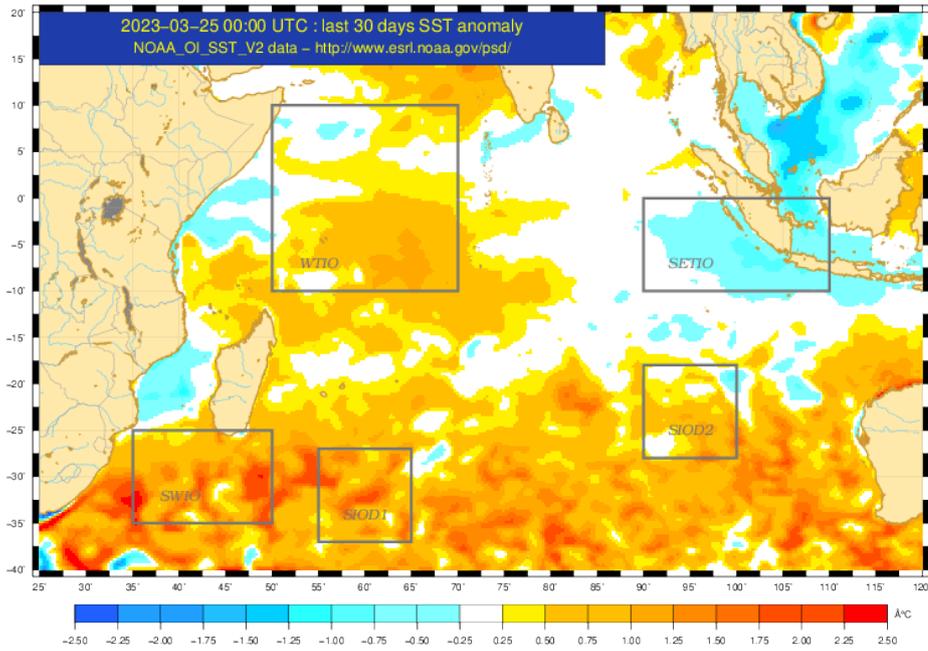


sea surface temperature
3-months ensemble mean anomaly

unit : °C (white = no signal)

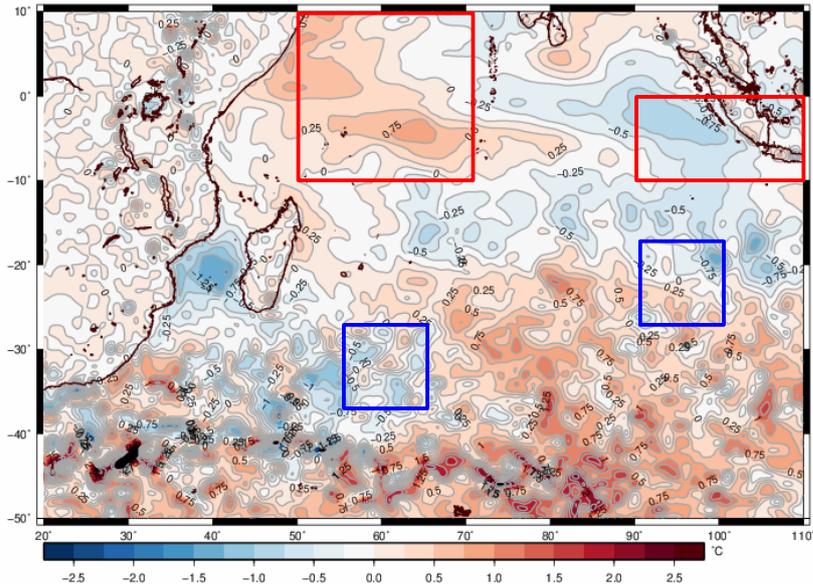


Signal Basse Fréquence - Zoom sur l'OI

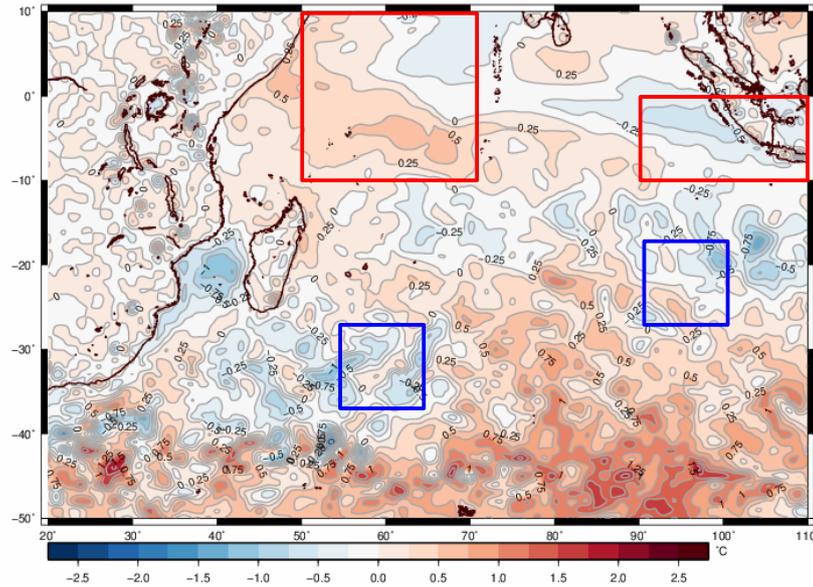


Signal Basse Fréquence – Prévission SST OI

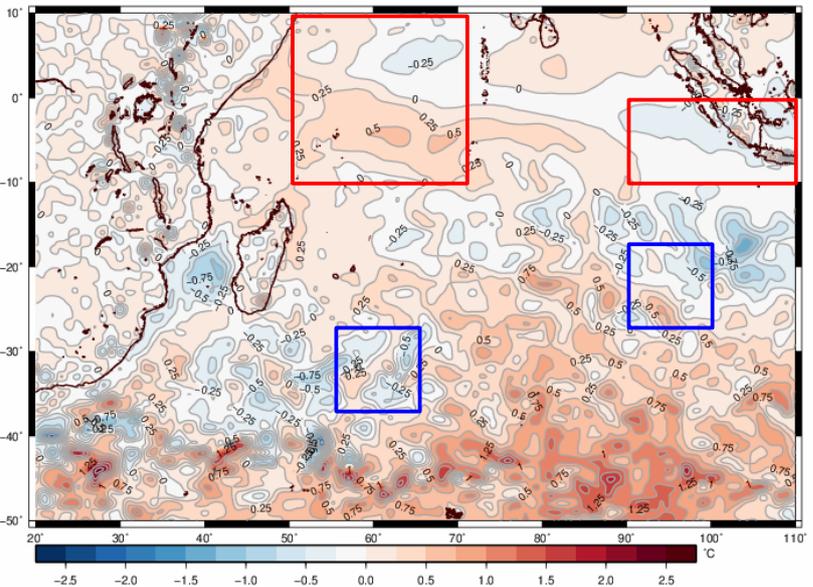
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période du 2023-03-27 au 2023-04-03
Prévission mensuelle CEPMMT base 2023-03-27



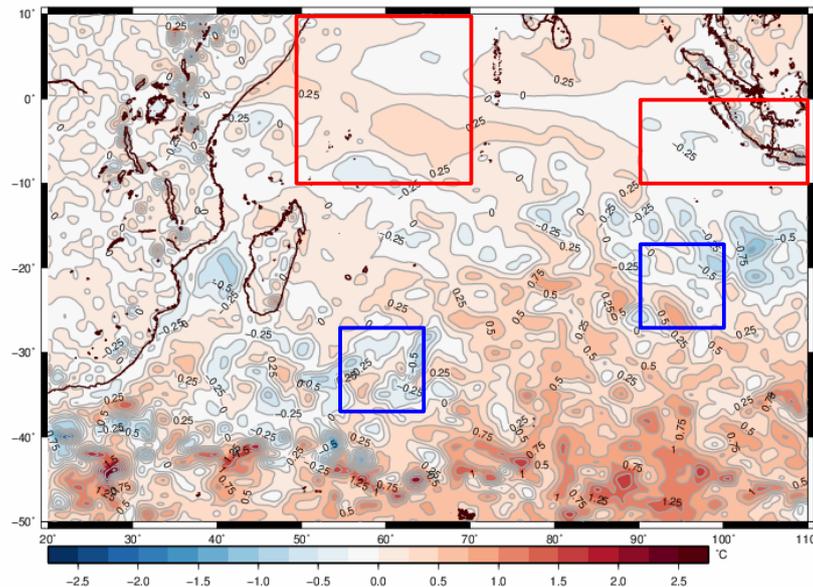
Anomalie de température de surface océanique
période du 2023-04-03 au 2023-04-10
Prévission mensuelle CEPMMT base 2023-03-27



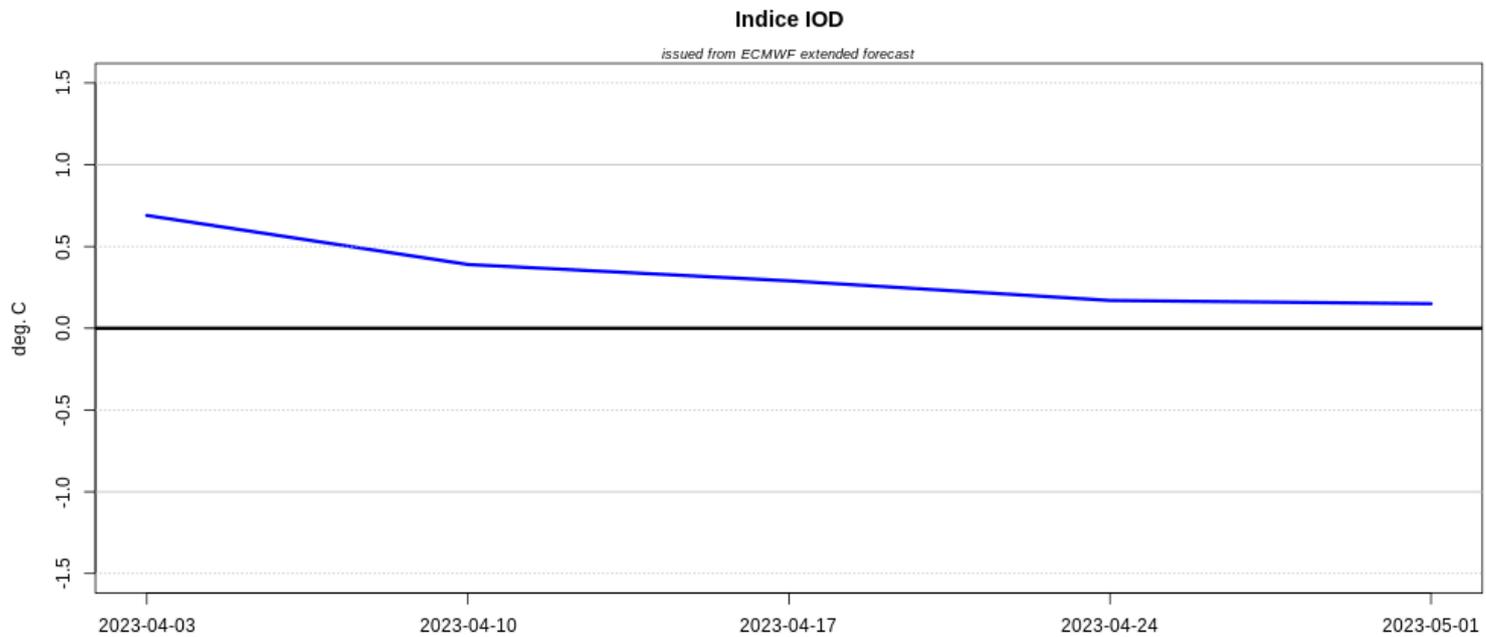
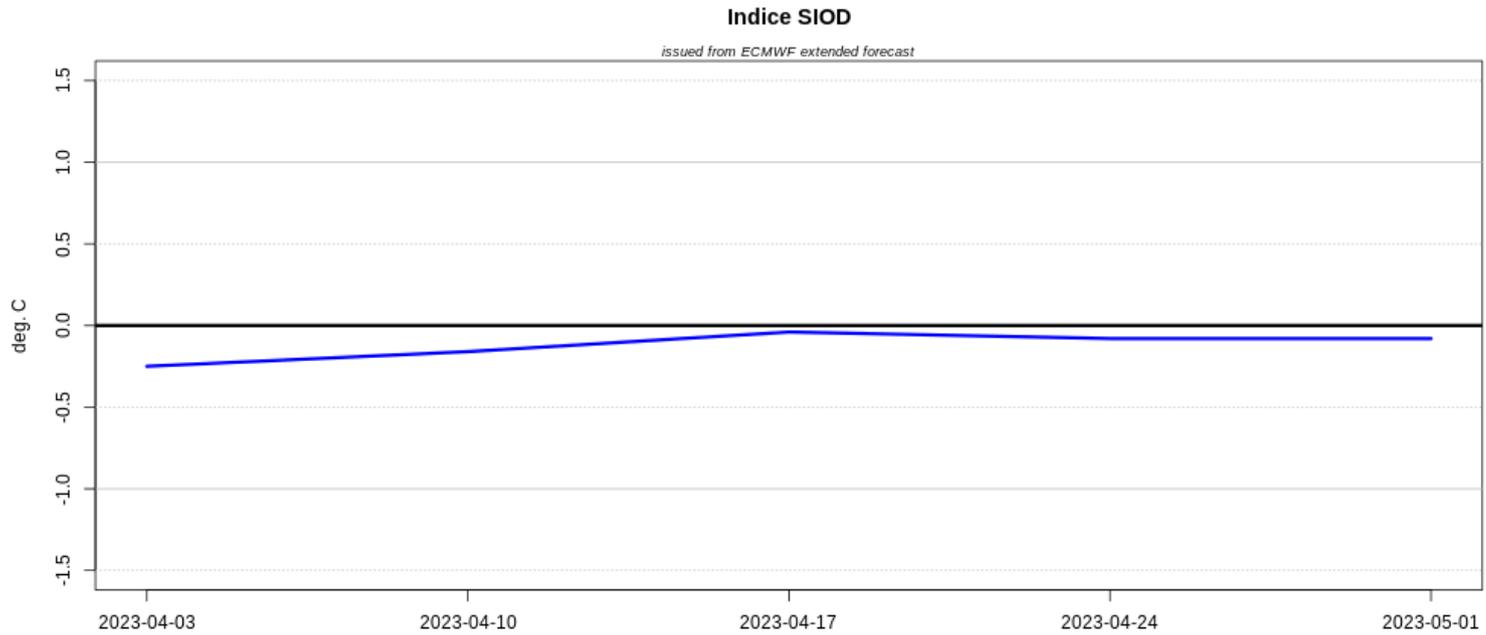
Anomalie de température de surface océanique
période du 2023-04-10 au 2023-04-17
Prévission mensuelle CEPMMT base 2023-03-27



Anomalie de température de surface océanique
période du 2023-04-17 au 2023-04-24
Prévission mensuelle CEPMMT base 2023-03-27



Signal Basse Fréquence – Prévision SST OI



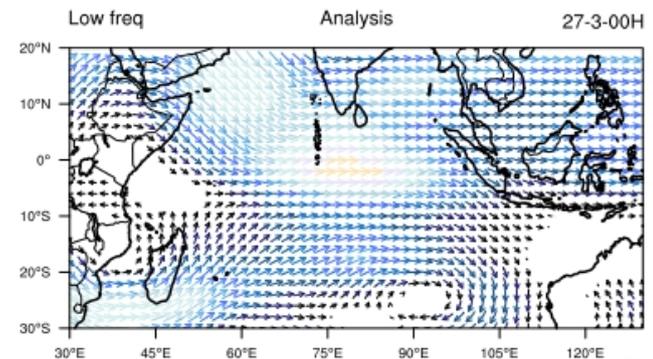
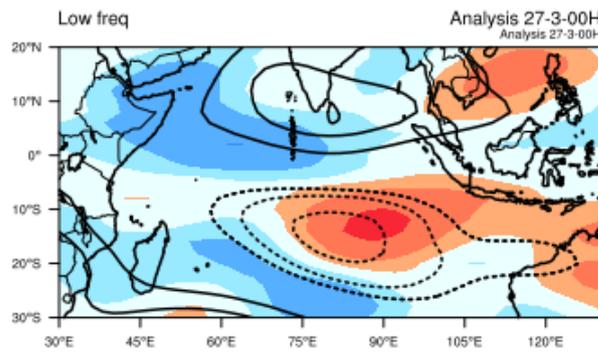
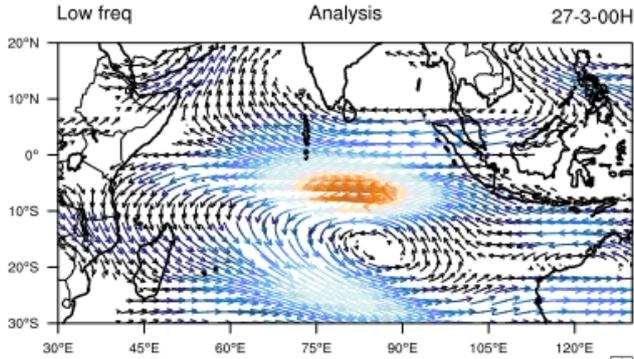
Signal Basse Fréquence - Zoom sur l'OI

J0

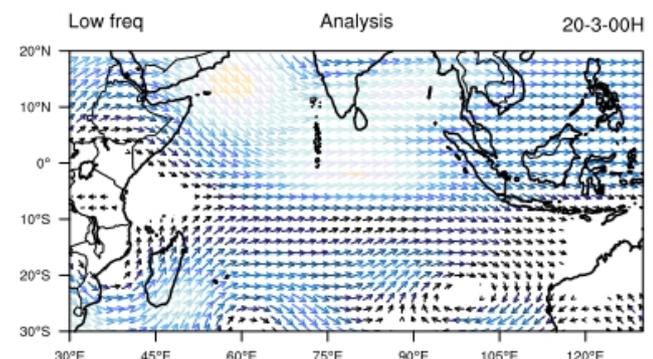
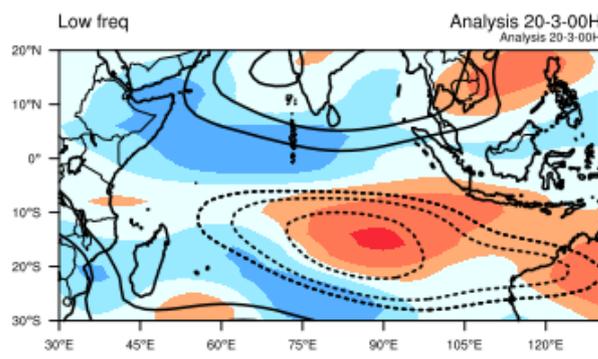
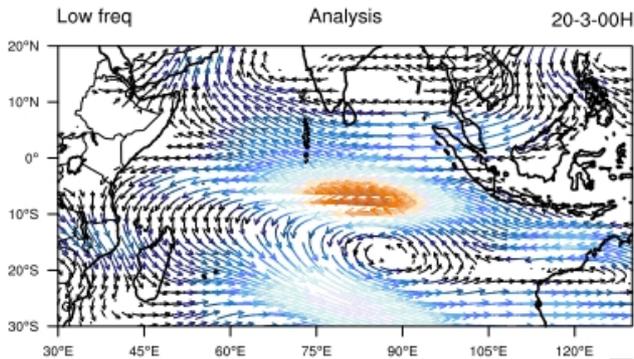
U850

PW+SF850

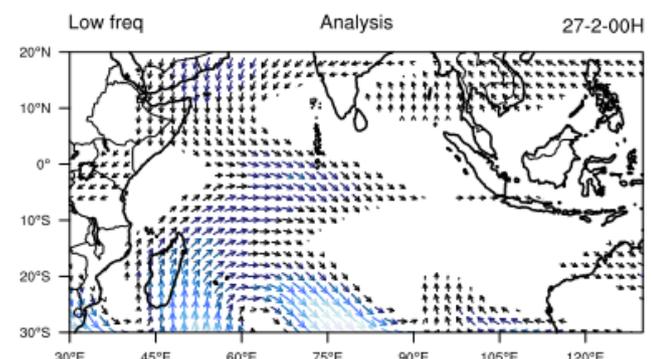
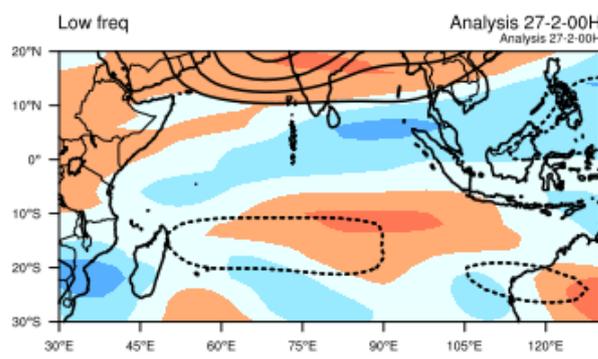
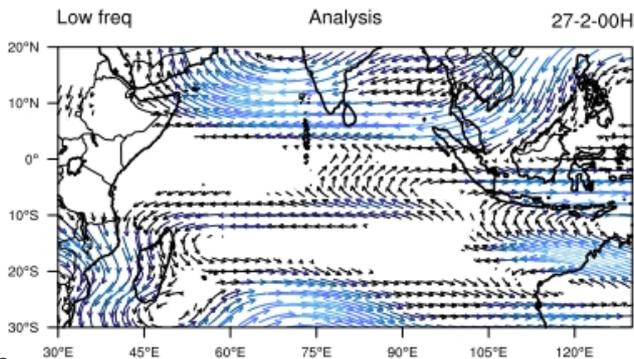
U200



J-8



J-29

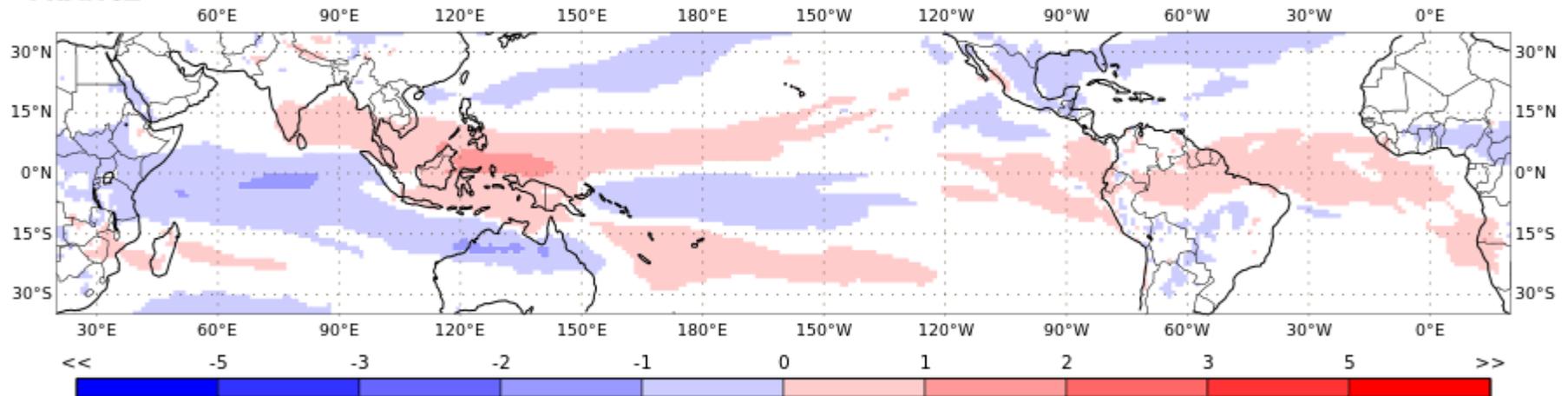


Signal Basse Fréquence

U 850 prévu



Meteo-France system 8 - Forecast
For AMJ 2023 (issued March 2023)



850hPa U wind component
3-months ensemble mean anomaly

unit : m/s (white = no signal)



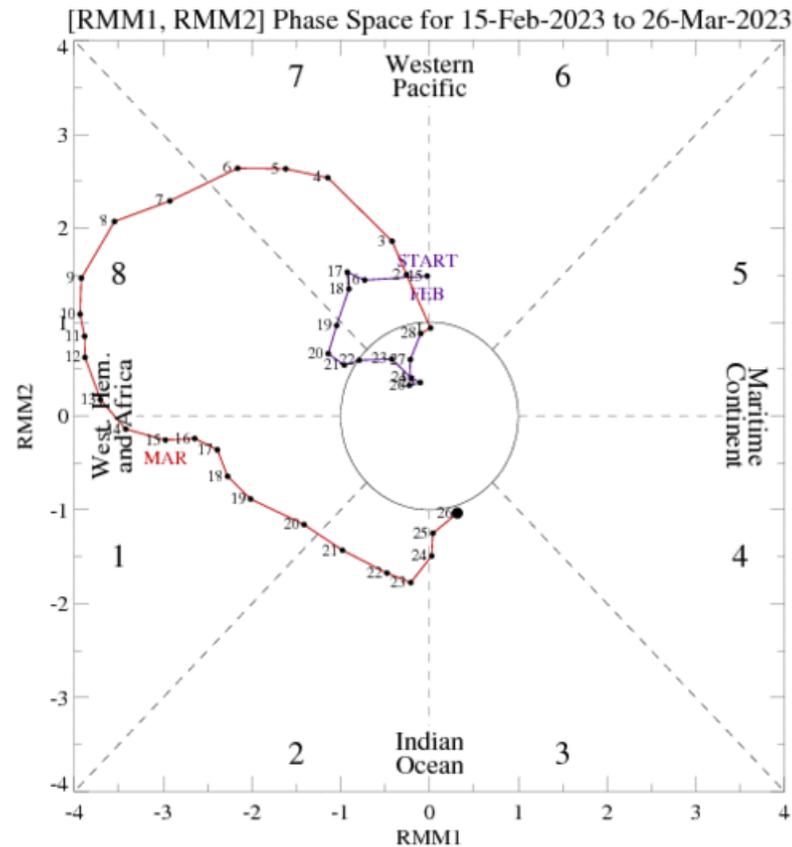
Signal Basse Fréquence – Climatologie

Climate conf.	Number of Weeks	Probability %	Anomaly %
ALL	636	30,7	0
NINA	89	34,8	4,1
NINO	93	38,7	8
SIOD-	84	35,7	5
SIOD+	69	43,5	12,8
NINA - SIOD+	9	33,3	2,6
NINA - SIOD-	3	100	69,3
NINA - IOD-SIOD			
Neutral	60	33,3	2,6
NINO - SIOD+	4	50	19,3
NINO - SIOD-	20	45	14,3
NINO - IOD-SIOD			
Neutral	56	30,4	-0,3
ENSONeutral - SIOD+	56	44,6	13,9
ENSONeutral - SIOD-	61	29,5	-1,2
IOD-	57	38,6	7,9
IOD+	36	13,9	-16,8
NINA - IOD-	13	15,4	0
NINA - IOD+	5	40	0
NINO - IOD-	14	0	0
NINO - IOD+	0		0
ENSONeutral - IOD+	31	6,5	-24,2
ENSONeutral - IOD-	30	30	-0,7
All Neutral	286	26,6	-4,1

Source : Bonnardot et al. (en préparation) :
Inter-annual variability of TC-activity and associated impacts over SWIO basin.

2. Prévision - MJO

2. MJO observée, indice RMM

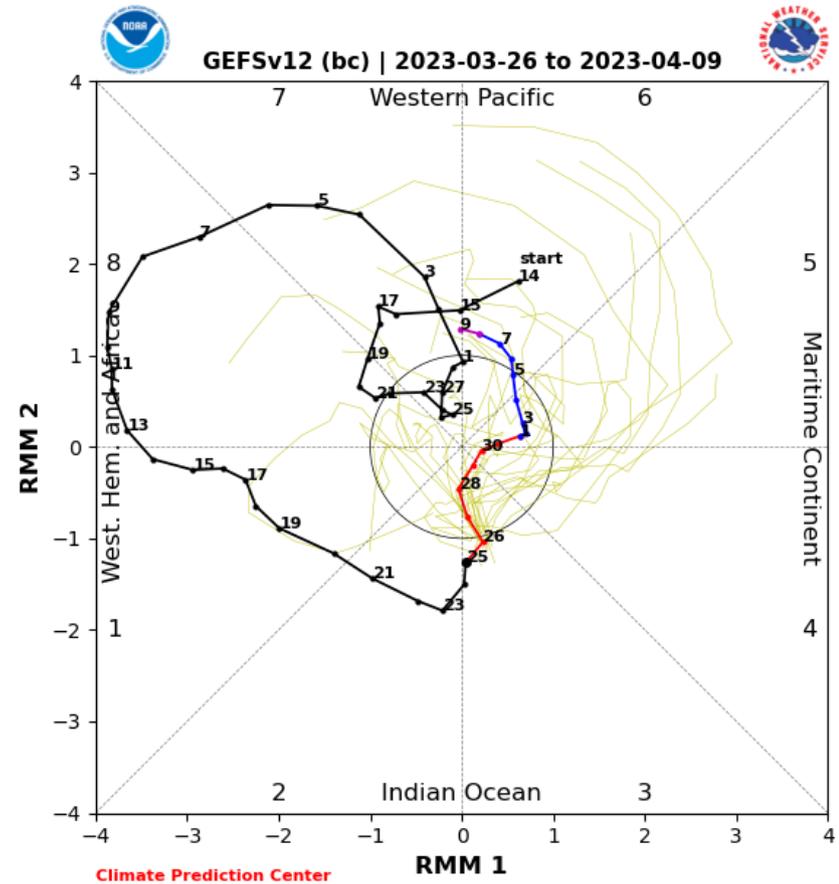
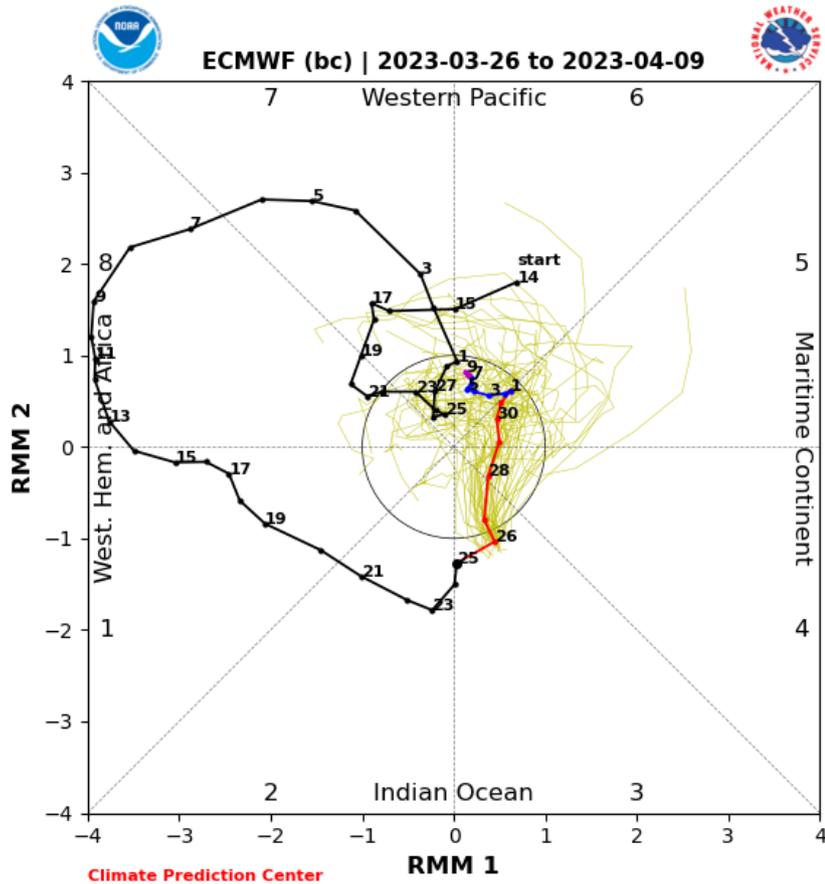


Retour sur les derniers briefings :

⁽⁻¹⁾ briefing du 24/01
⁽⁻²⁾ briefing du 28/02

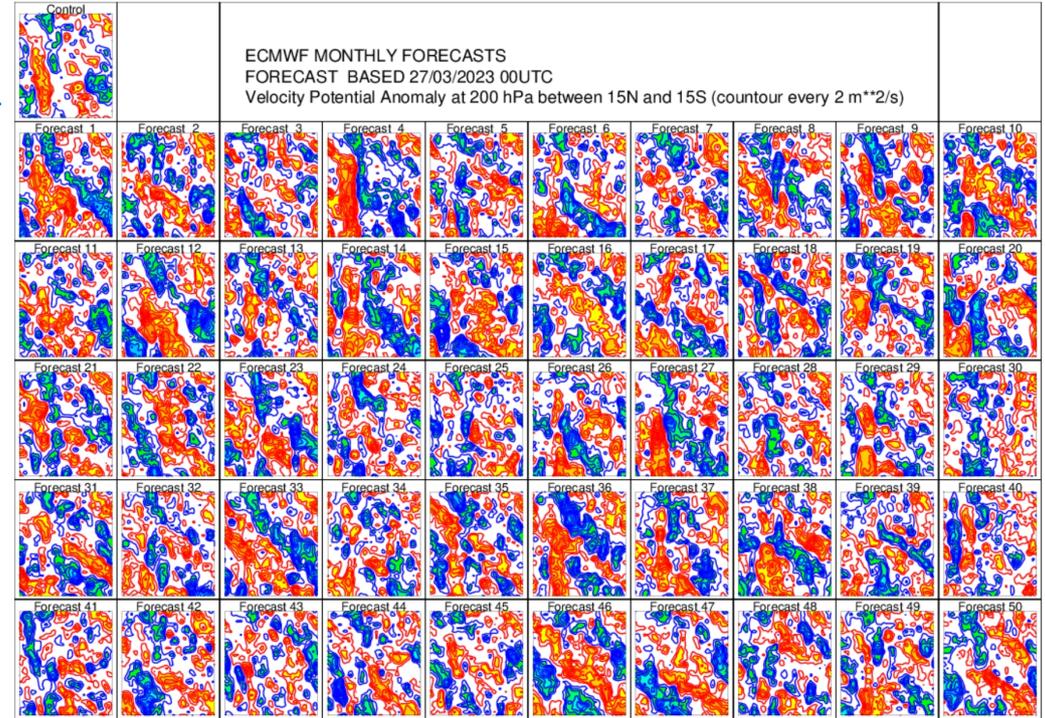
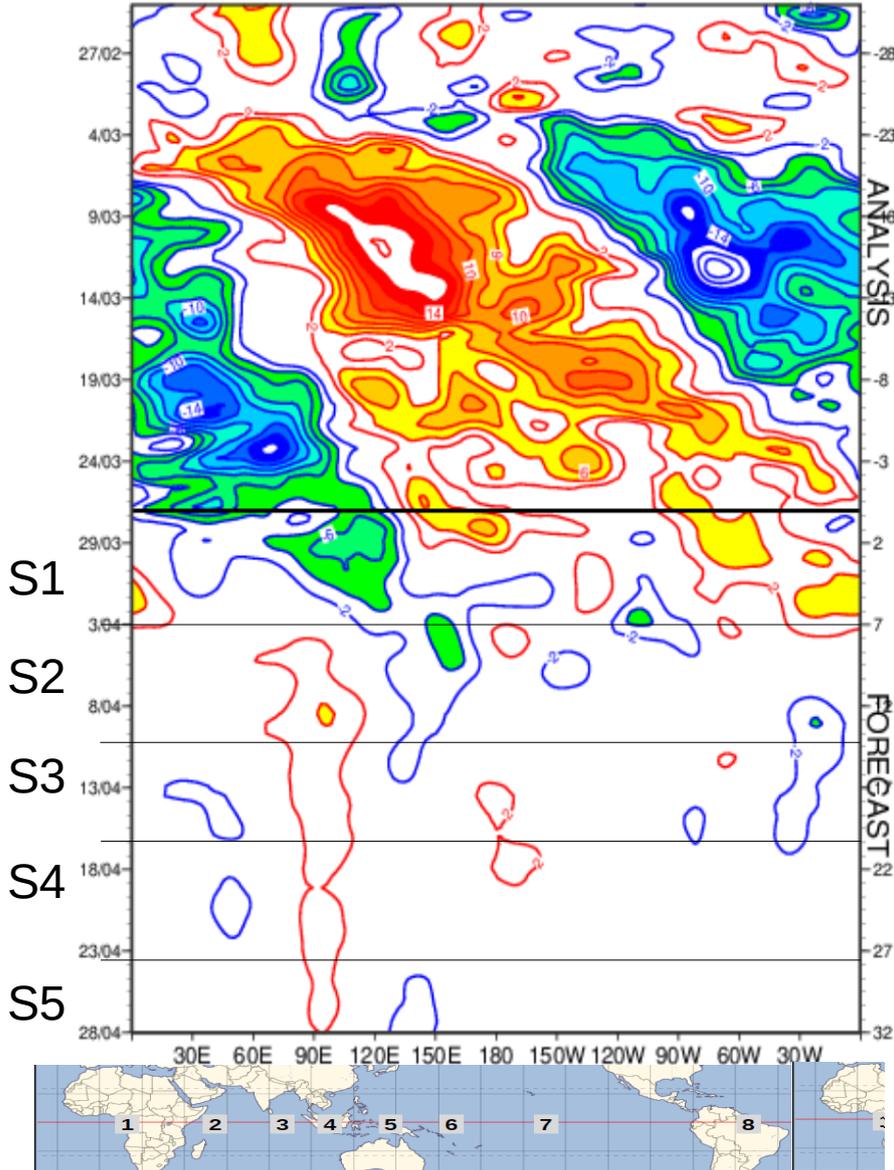
	13 – 19 fév	20 – 26 fév	27 fév - 5 mars	6 - 12 mars	13 – 19 mars	20 – 26 mars
Phase MJO observée	6/7/8	8	7	7/8	8/1	1/2/3
Intensité	Forte	Faible à mod.	Faible à forte	Forte	Forte	Mod. à faible
Phase MJO prévue	7	8/1	7	8	8/1	1/2
Intensité	Faible à mod.	Faible à mod.	Faible à mod.	Faible à mod.	Forte	Mod. À forte
Confiance	<i>Moyenne</i> ⁽⁻¹⁾	<i>Moyenne</i> ⁽⁻¹⁾	<i>Bonne</i> ⁽⁻²⁾	<i>Bonne</i> ⁽⁻²⁾	<i>Moyenne</i> ⁽⁻²⁾	<i>Moyenne</i> ⁽⁻²⁾

MJO prévue indice RMM multi modèles



Moyenne EPS

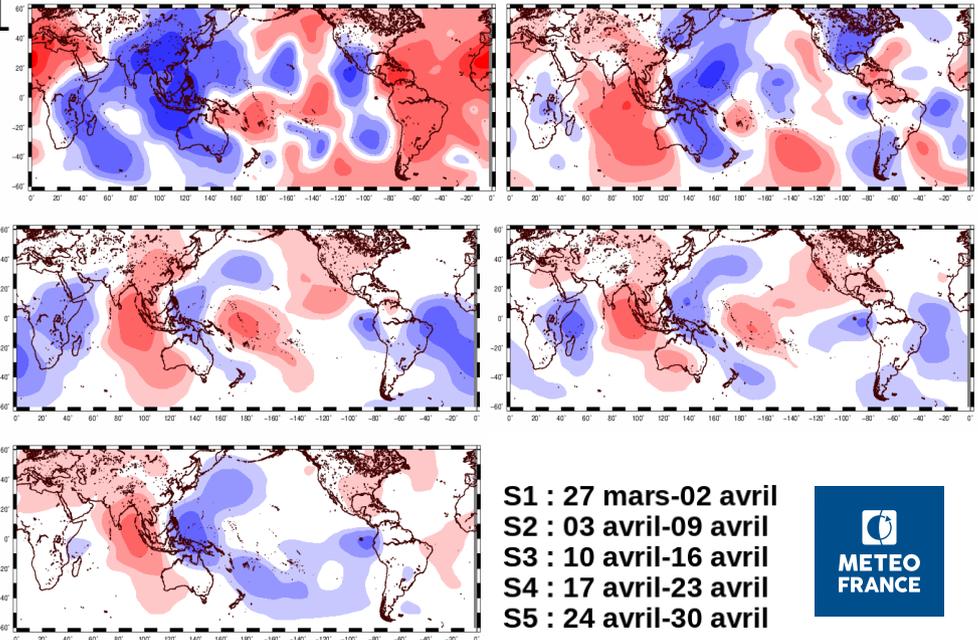
VELOCITY POTENTIAL AT 200 HPA
Ensemble mean between Lat 15S and 15N
FORECAST BASED 27/03/2023 00UTC



S1
S2
S3
S4
S5

S1
S3
S5

S2
S4



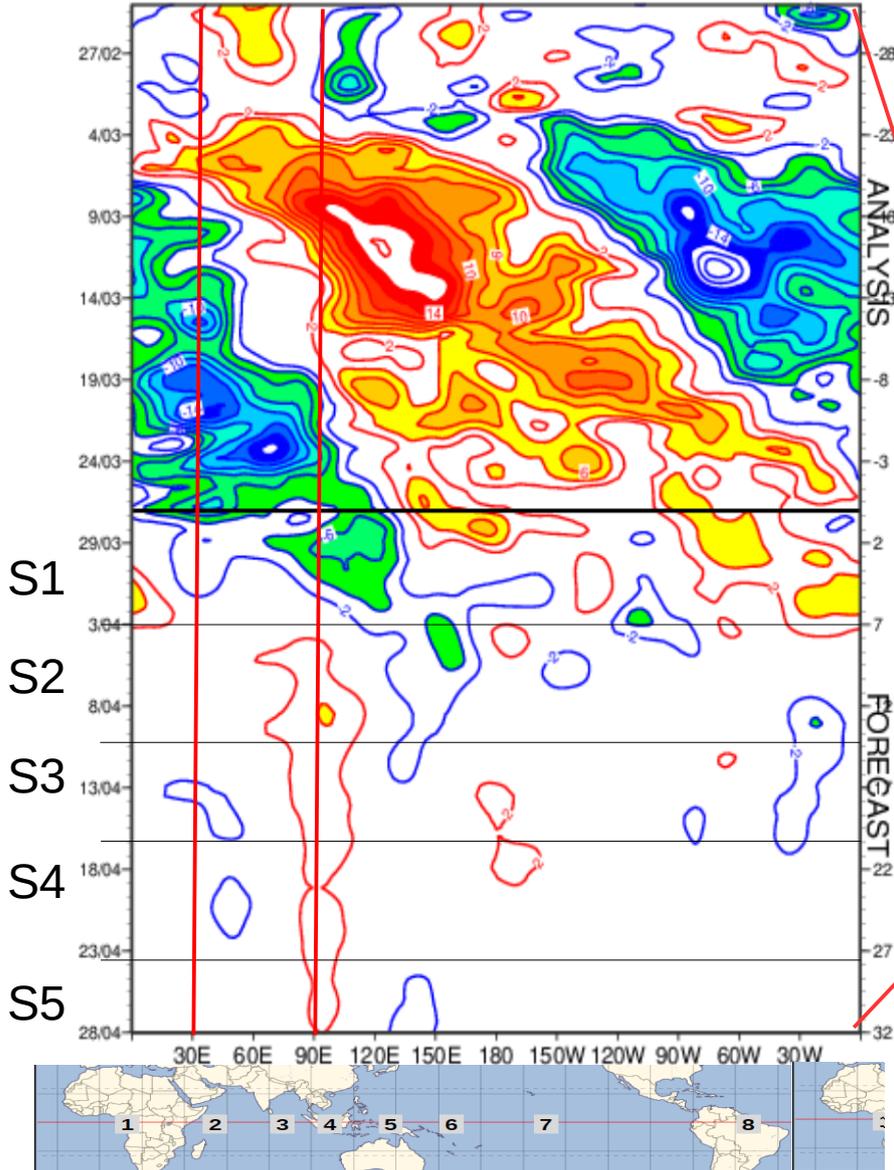
S1 : 27 mars-02 avril
S2 : 03 avril-09 avril
S3 : 10 avril-16 avril
S4 : 17 avril-23 avril
S5 : 24 avril-30 avril



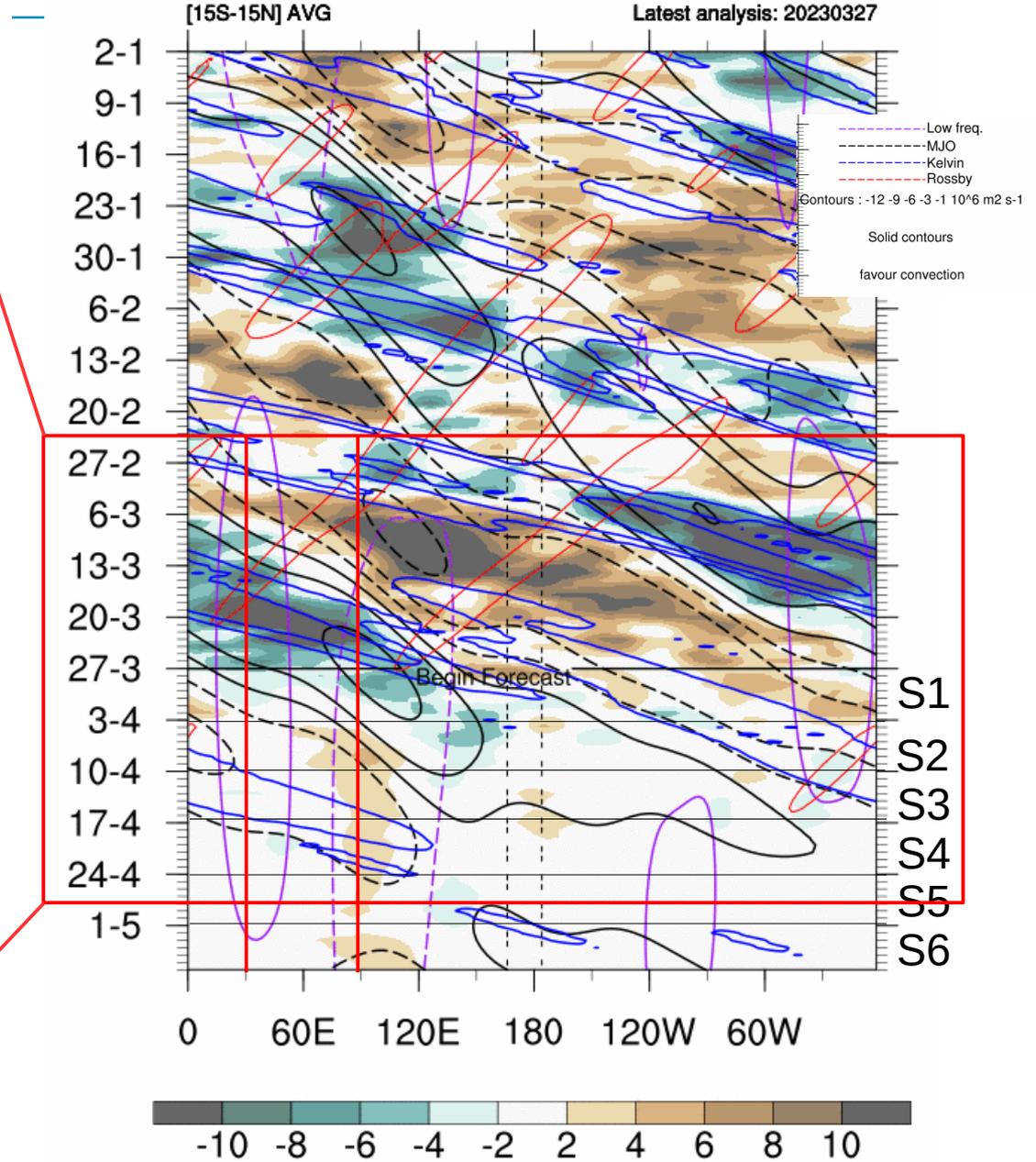
VP200 – EPS mensuel

Moyenne EPS

VELOCITY POTENTIAL AT 200 HPA
Ensemble mean between Lat 15S and 15N
FORECAST BASED 27/03/2023 00UTC



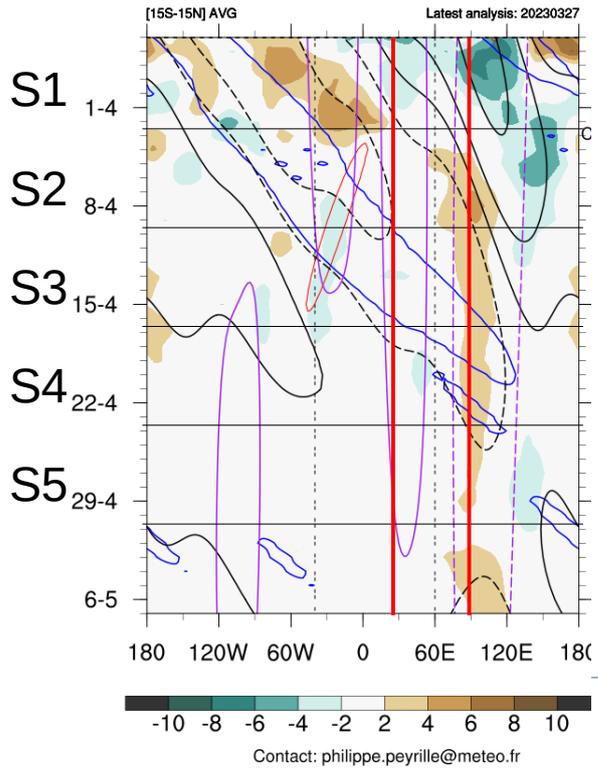
vp200 anomaly + Eq. Waves filtering



Clustering MJO

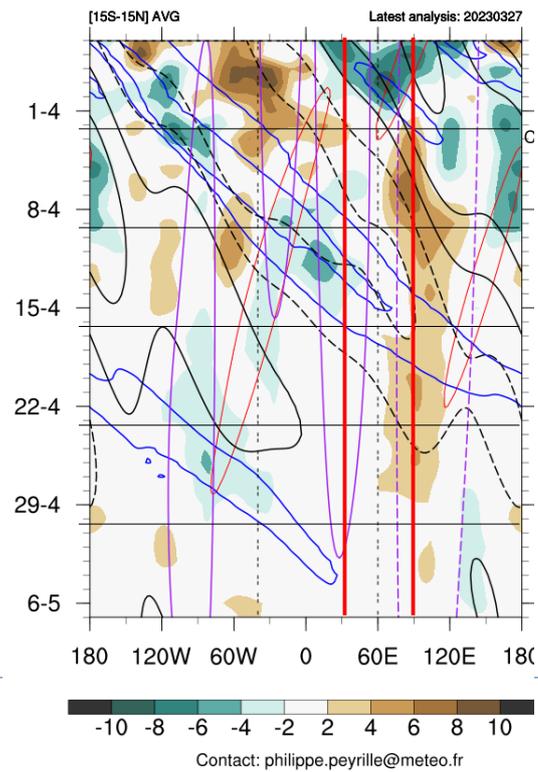
Moy 51 membres

vp200 anomaly + Eq. Waves filtering



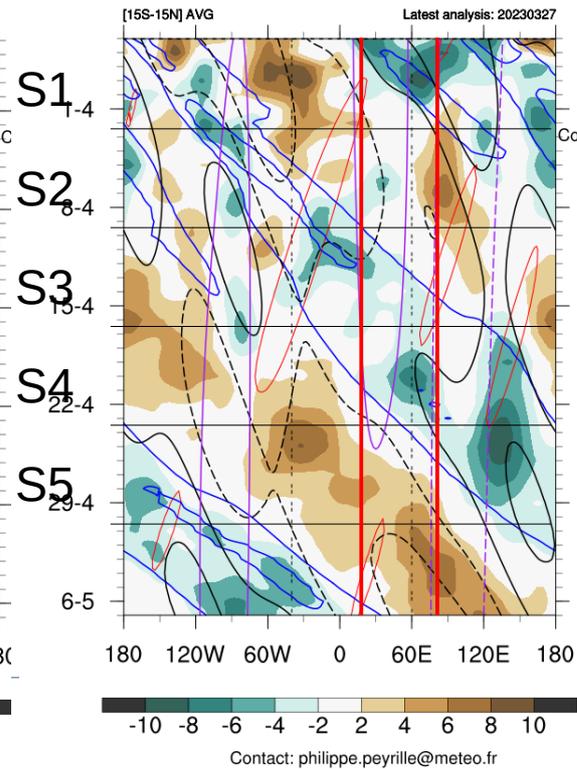
34 membres

vp200 anomaly + Eq. Waves filtering



17 membres

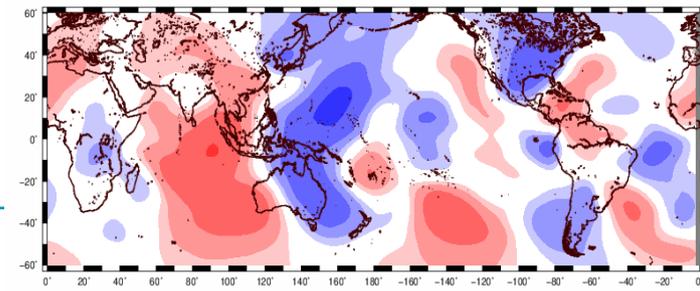
vp200 anomaly + Eq. Waves filtering



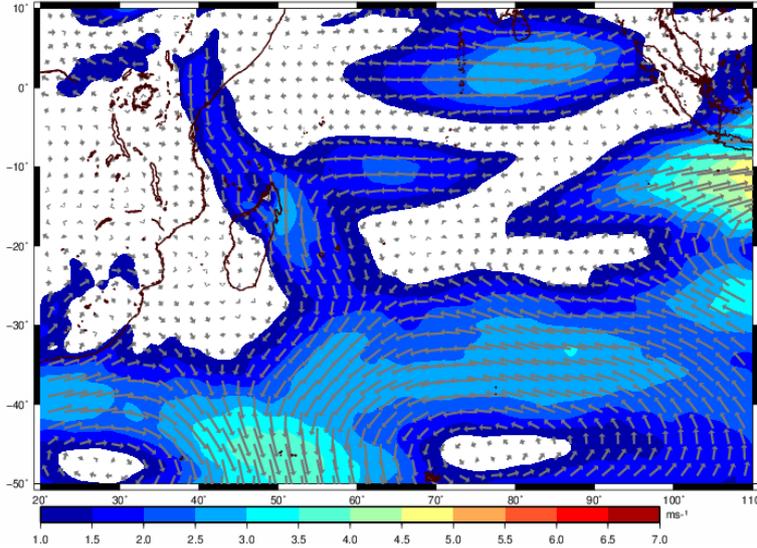
- Low freq.
 - MJO
 - Kelvin
 - Rossby
- Contours : -12 -9 -6 -3 -1 $10^6 \text{ m}^2 \text{ s}^{-1}$
- Solid contours
favour convection

MJO : Préviation U,V vs MJO Composite

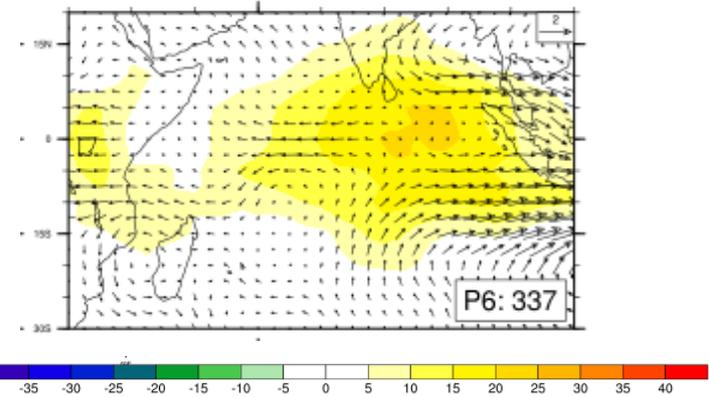
S2
MJO prévue
PHASE 6



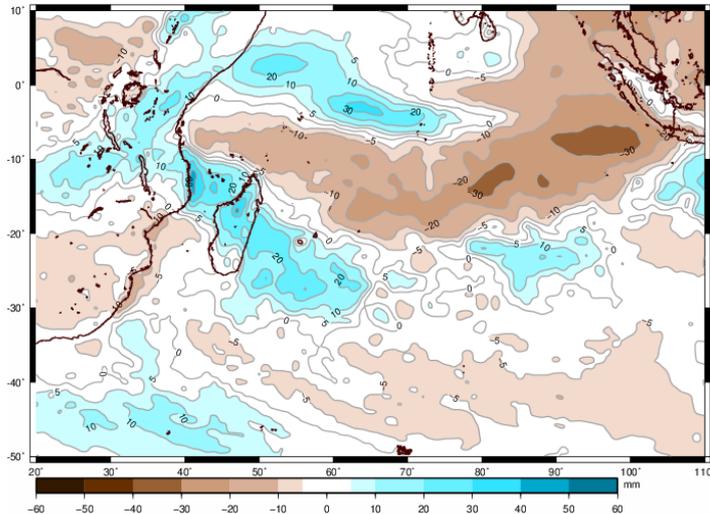
Anomalie force du vent 850hPa
période du 2023-04-03 au 2023-04-10
Préviation mensuelle CEPMMT base 2023-03-27



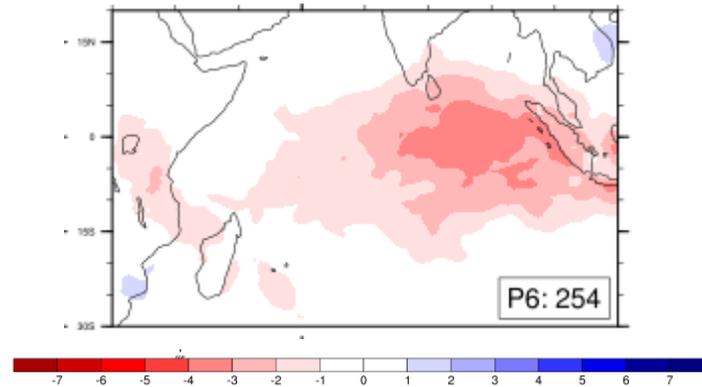
Anomalies : OLR (W/m²) and 850 hPa winds - Nov to Apr 1990-2013



Anomalie de précipitations
période du 2023-04-03 au 2023-04-10
Préviation mensuelle CEPMMT base 2023-03-27



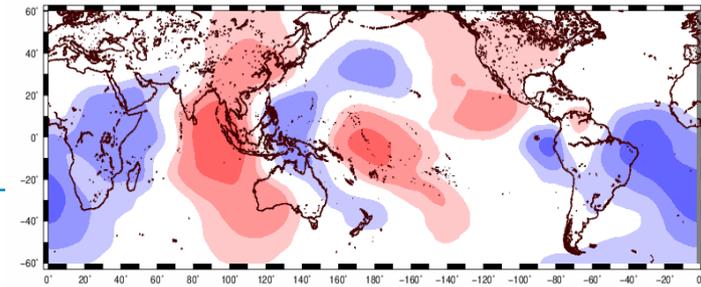
Anomalies : GPCP precipitation (mm/day) - Nov to Apr 1997-2013



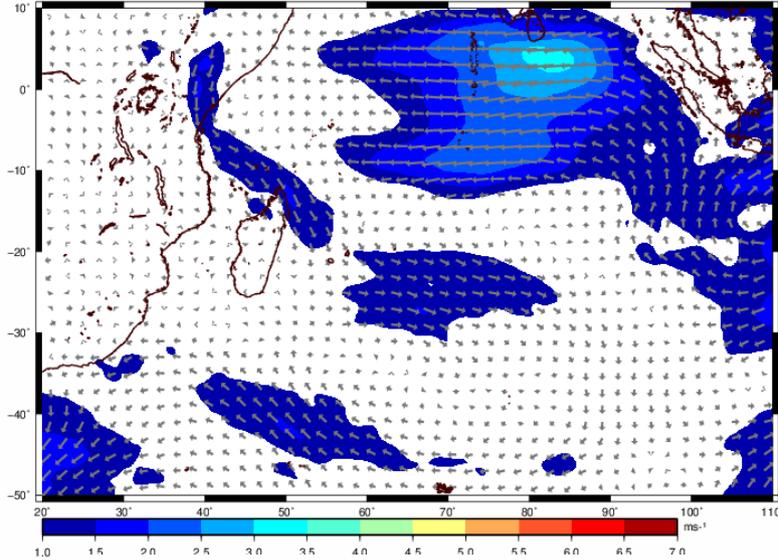
MJO : Pr evision U,V vs MJO Composite

S3

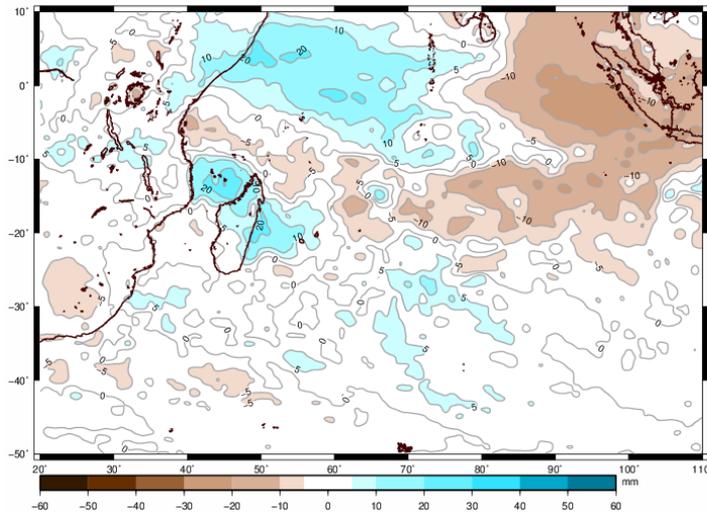
MJO pr evue
PHASE 7



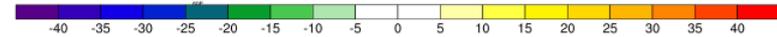
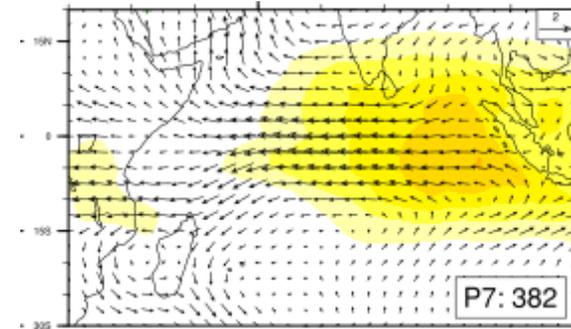
Anomalie force du vent 850hPa
p eriod du 2023-04-10 au 2023-04-17
Pr evision mensuelle CEPMMT base 2023-03-27



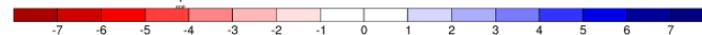
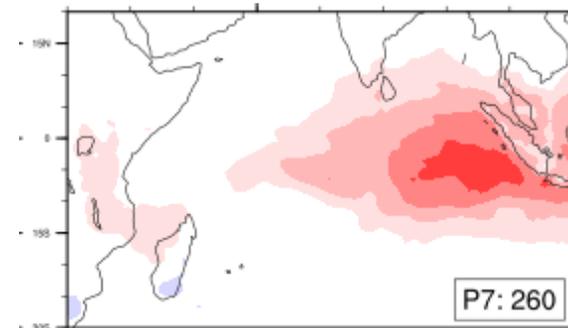
Anomalie de pr ecipitations
p eriod du 2023-04-10 au 2023-04-17
Pr evision mensuelle CEPMMT base 2023-03-27



Anomalies : OLR (W/m^2) and 850 hPa winds - Nov to Apr 1990-2013

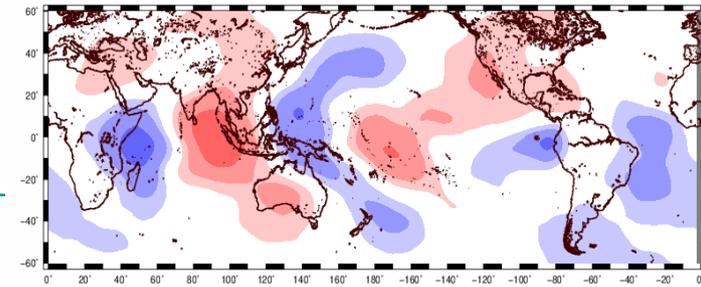


Anomalies : GPCP precipitation (mm/day) - Nov to Apr 1997-2013

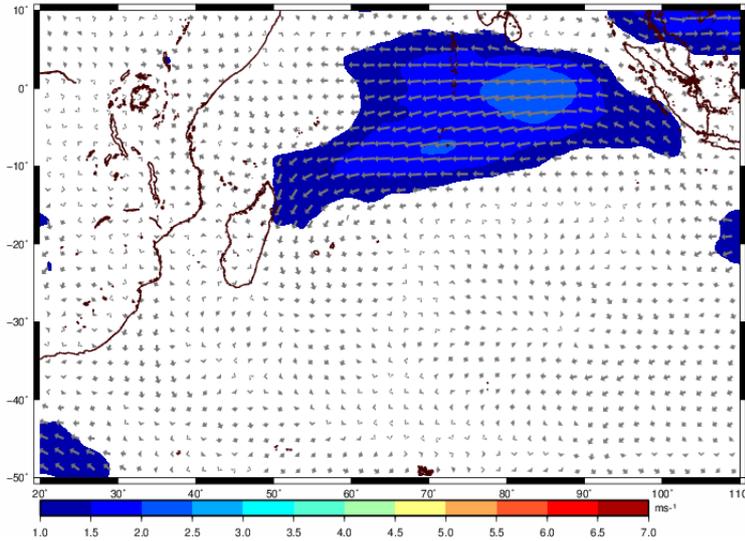


MJO : Pr evision U,V vs MJO Composite

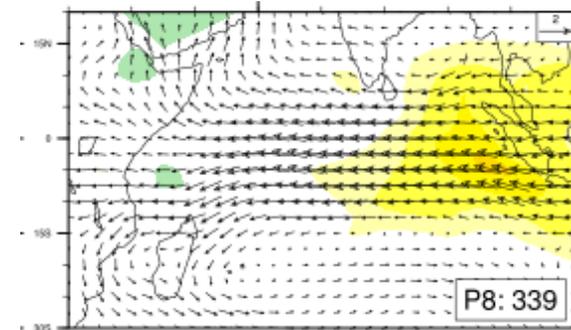
S4
MJO pr evue
PHASE 7/8



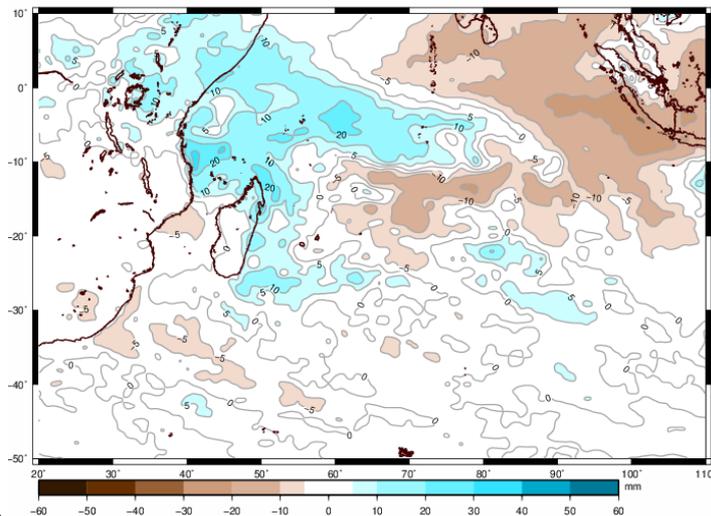
Anomalie force du vent 850hPa
p eriode du 2023-04-17 au 2023-04-24
Pr evision mensuelle CEPMMT base 2023-03-27



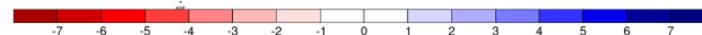
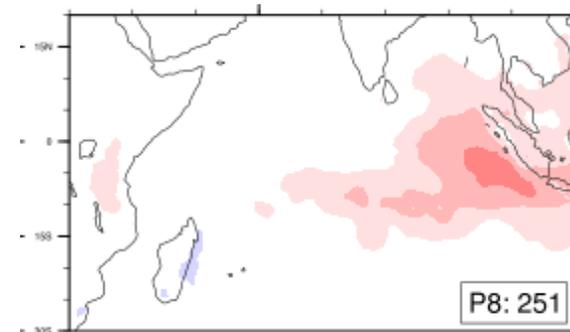
Anomalies : OLR (W/m^2) and 850 hPa winds - Nov to Apr 1990-2013



Anomalie de pr ecipitations
p eriode du 2023-04-17 au 2023-04-24
Pr evision mensuelle CEPMMT base 2023-03-27



Anomalies : GPCP precipitation (mm/day) - Nov to Apr 1997-2013

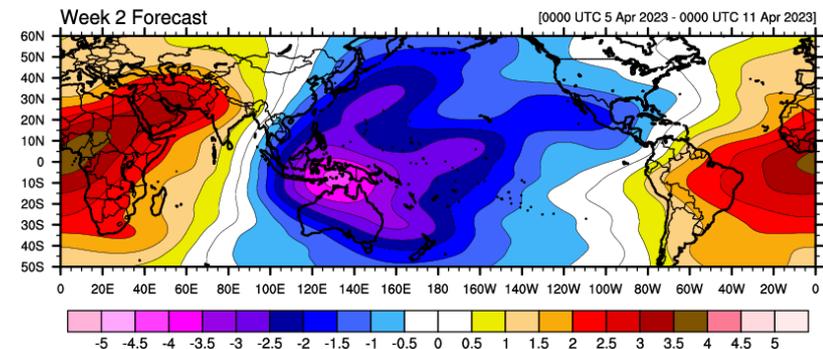
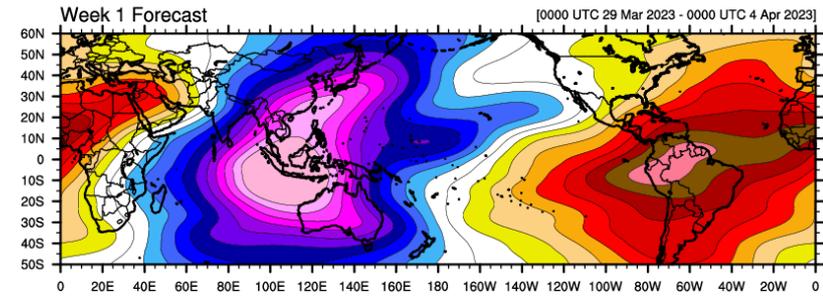
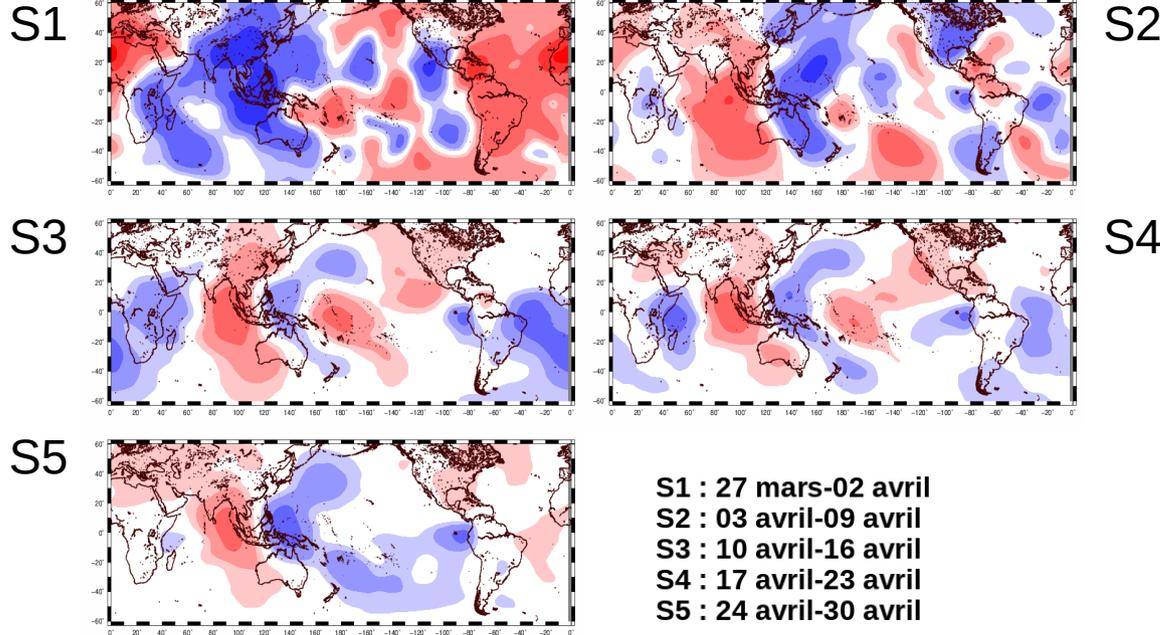
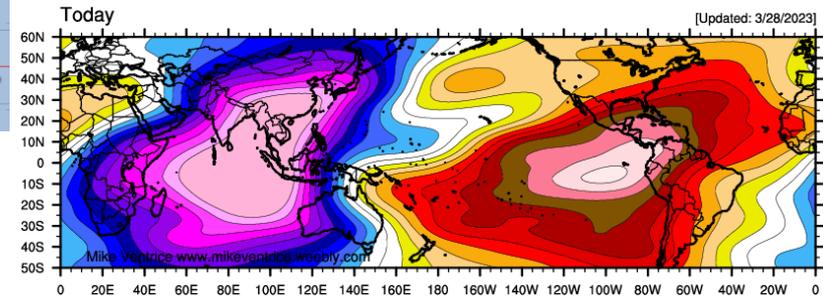


Synthèse MJO

	S1	S2	S3	S4	S5
Phase MJO prévue	3/4/5	6	7	[8] [2/3]	[?] [4/5]
Intensité	Faible	Faible	Faible ou Modérée	Faible Modérée	?
Confiance	Moyenne	Faible	Faible	Faible	?



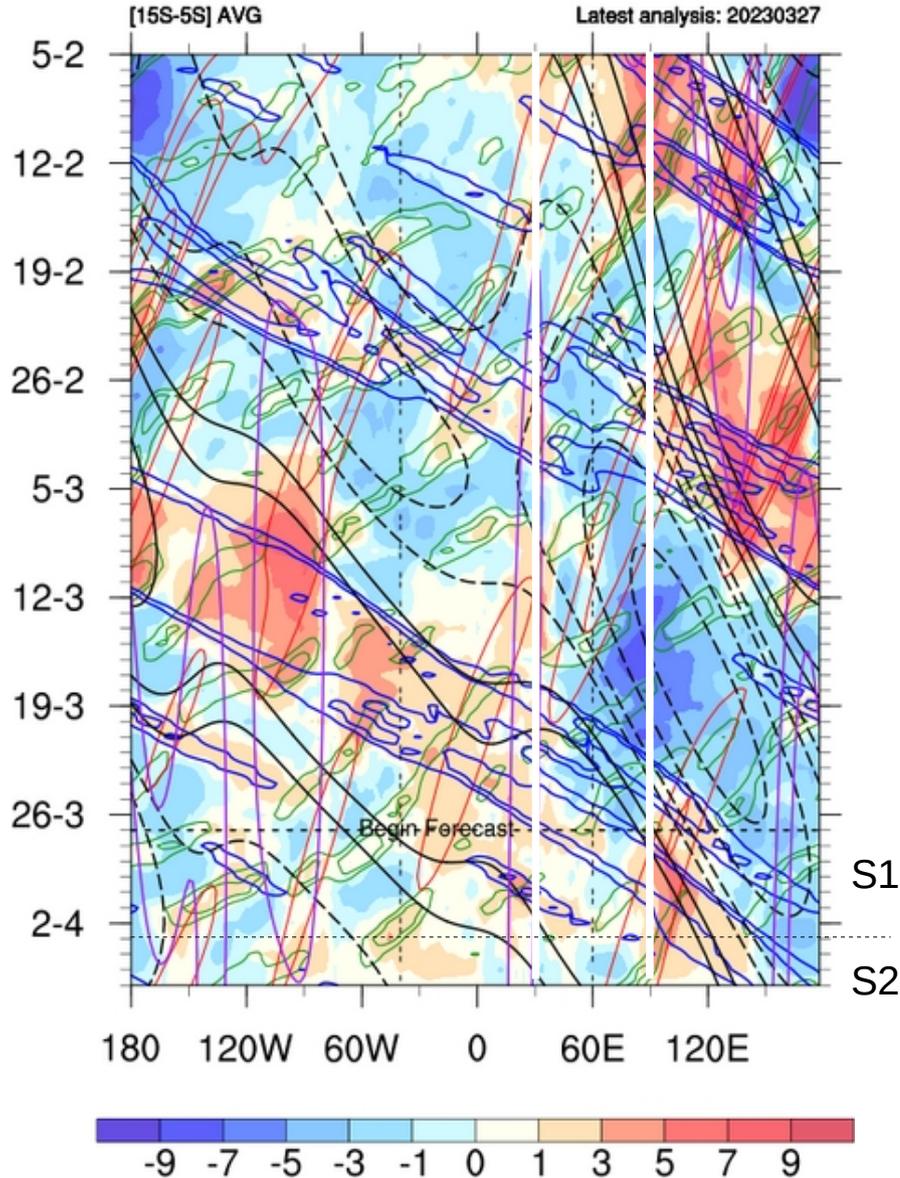
MJO filtered VP200 Forecast



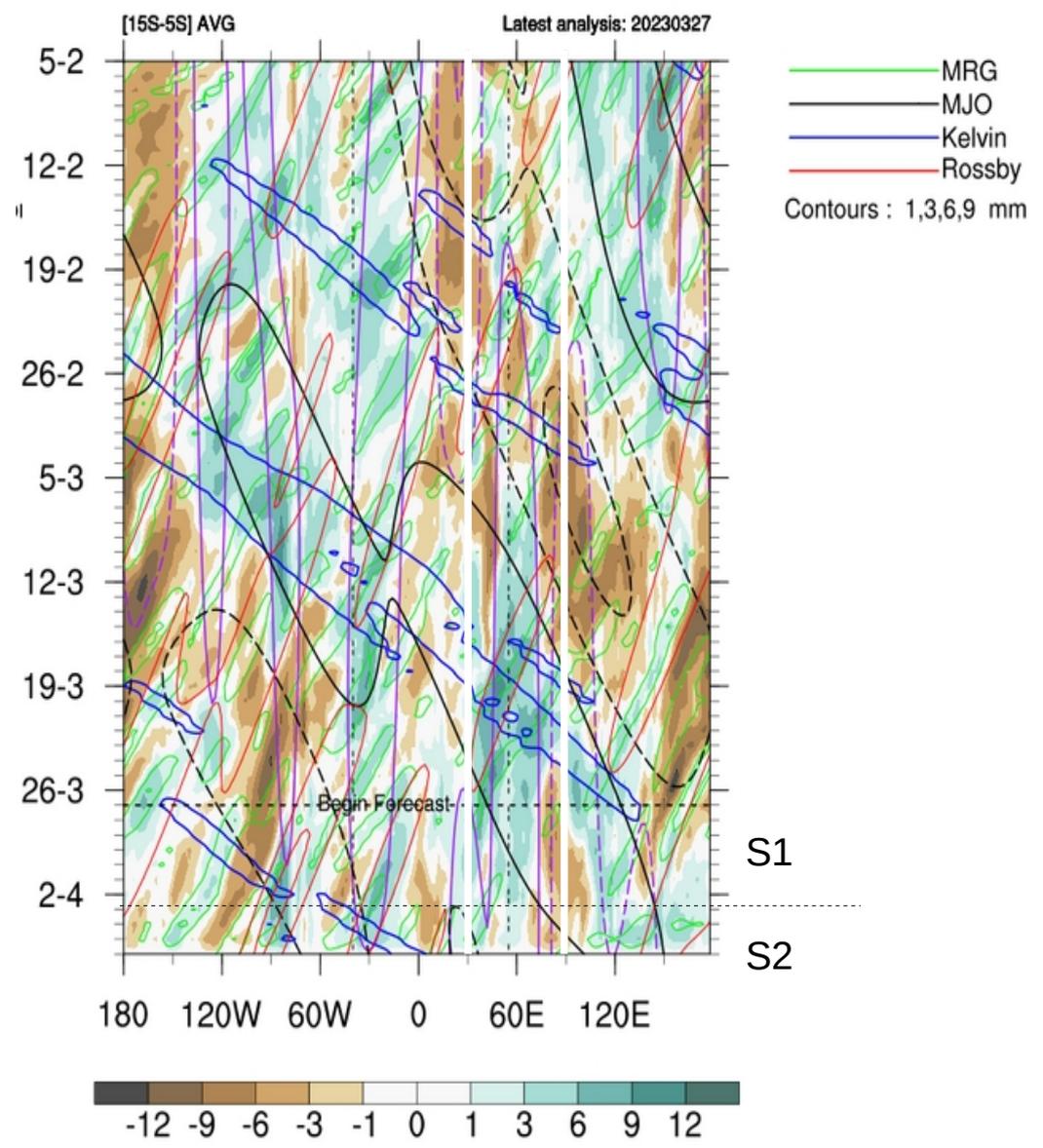
3. Prévision – Ondes équatoriales

3. Ondes équatoriales

u850 anomaly + Eq. Waves filtering



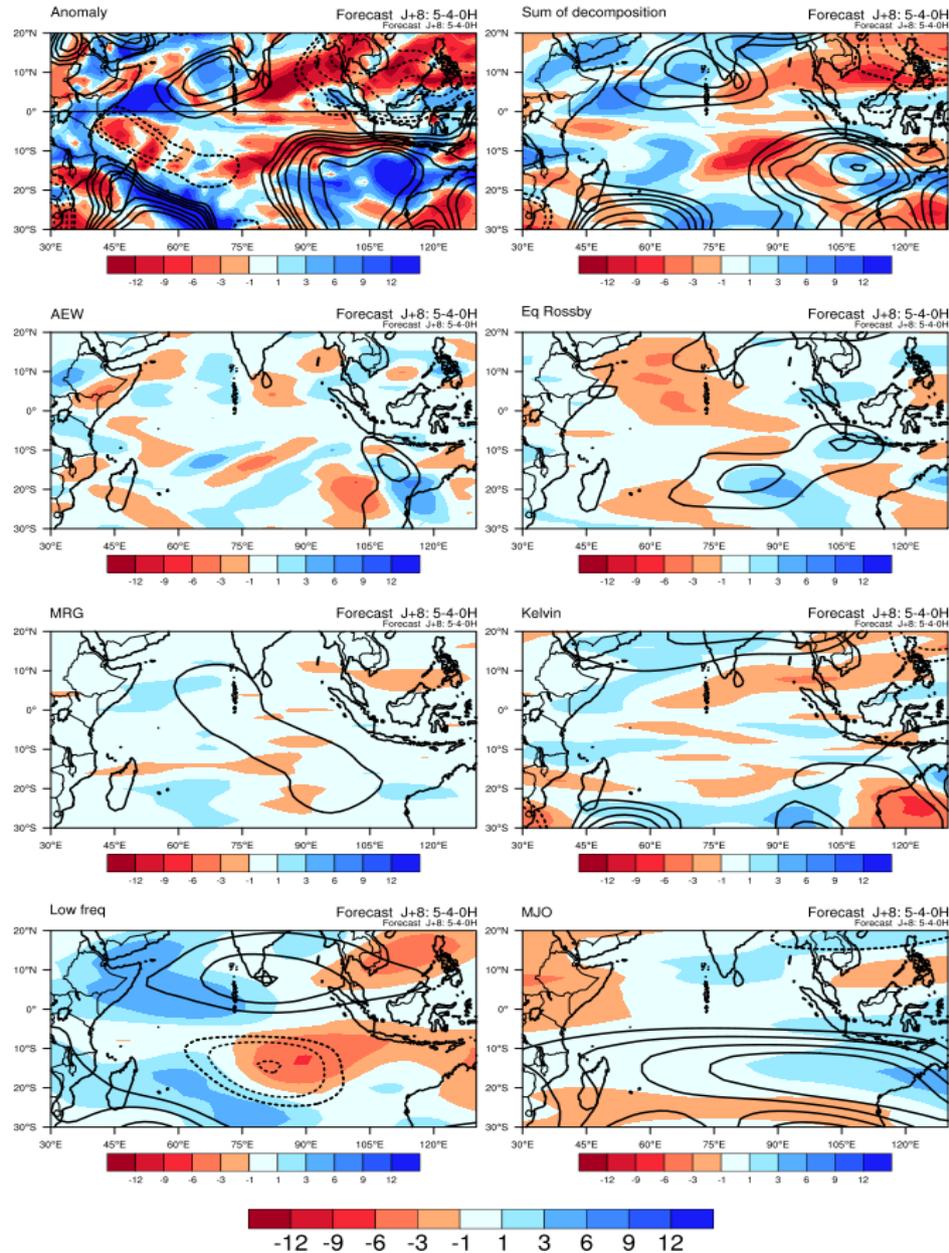
TCWV anomaly (mm) + Eq. Waves filtering



3. Ondes équatoriales

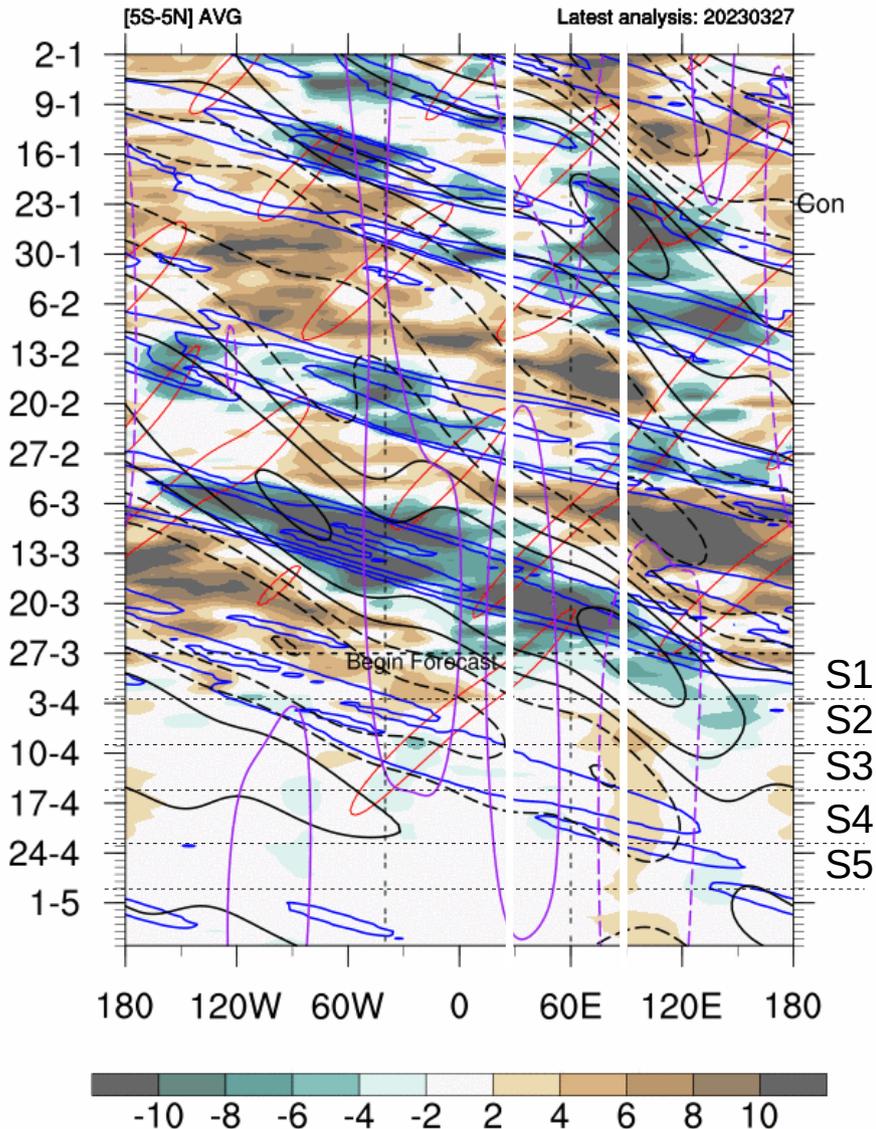
PW (color) and 850hPa StreamFct anomalies (contours)

J+8



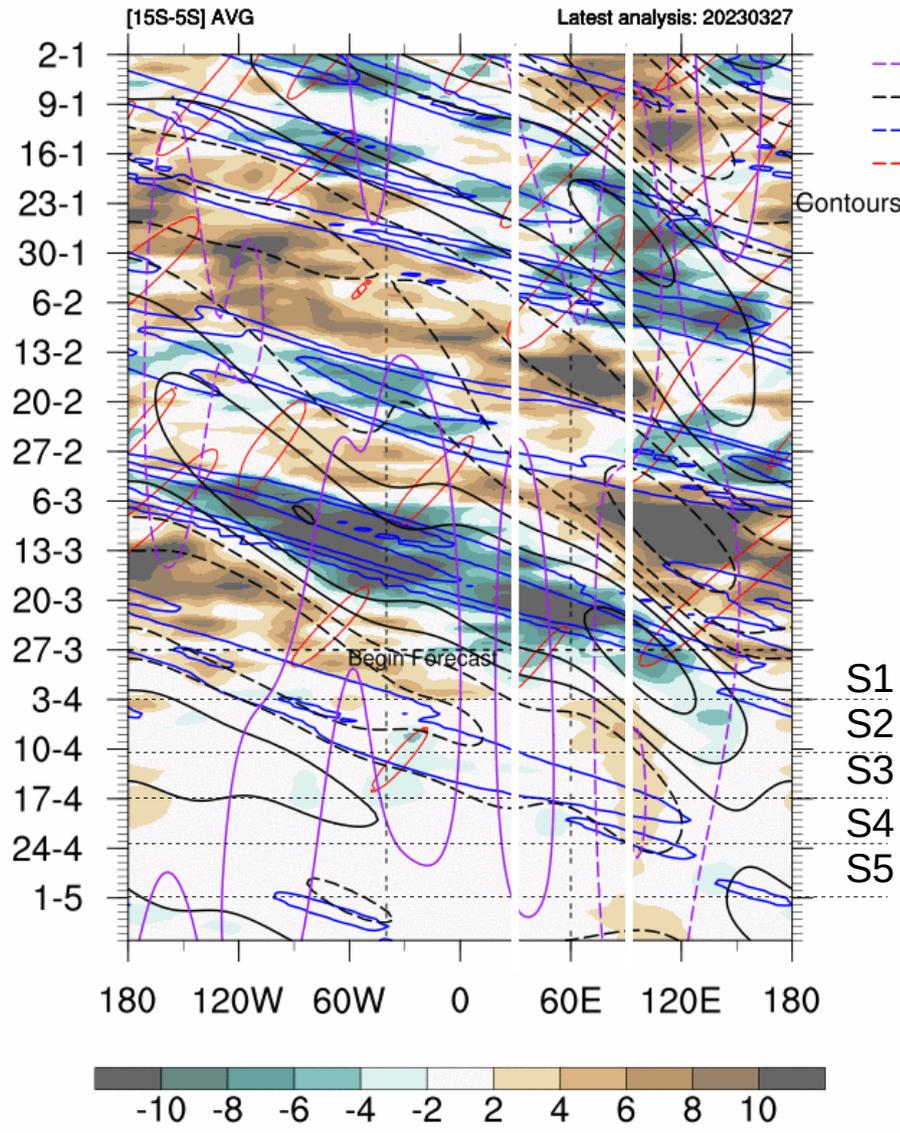
3. Ondes équatoriales

vp200 anomaly + Eq. Waves filtering



Contact: philippe.peyrille@meteo.fr

vp200 anomaly + Eq. Waves filtering



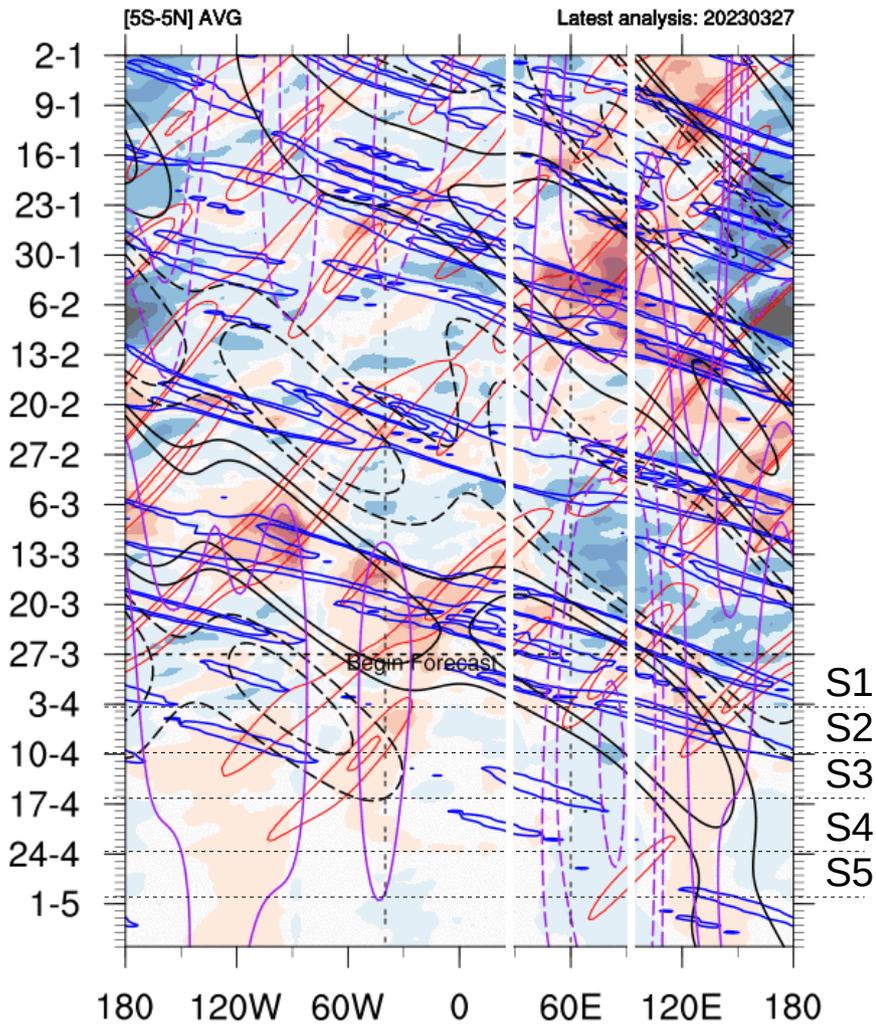
Contact: philippe.peyrille@meteo.fr

- Low freq.
 - MJO
 - Kelvin
 - Rossby
- Contours : -12 -9 -6 -3 -1 10⁶ m²
- Solid contours
favour convection

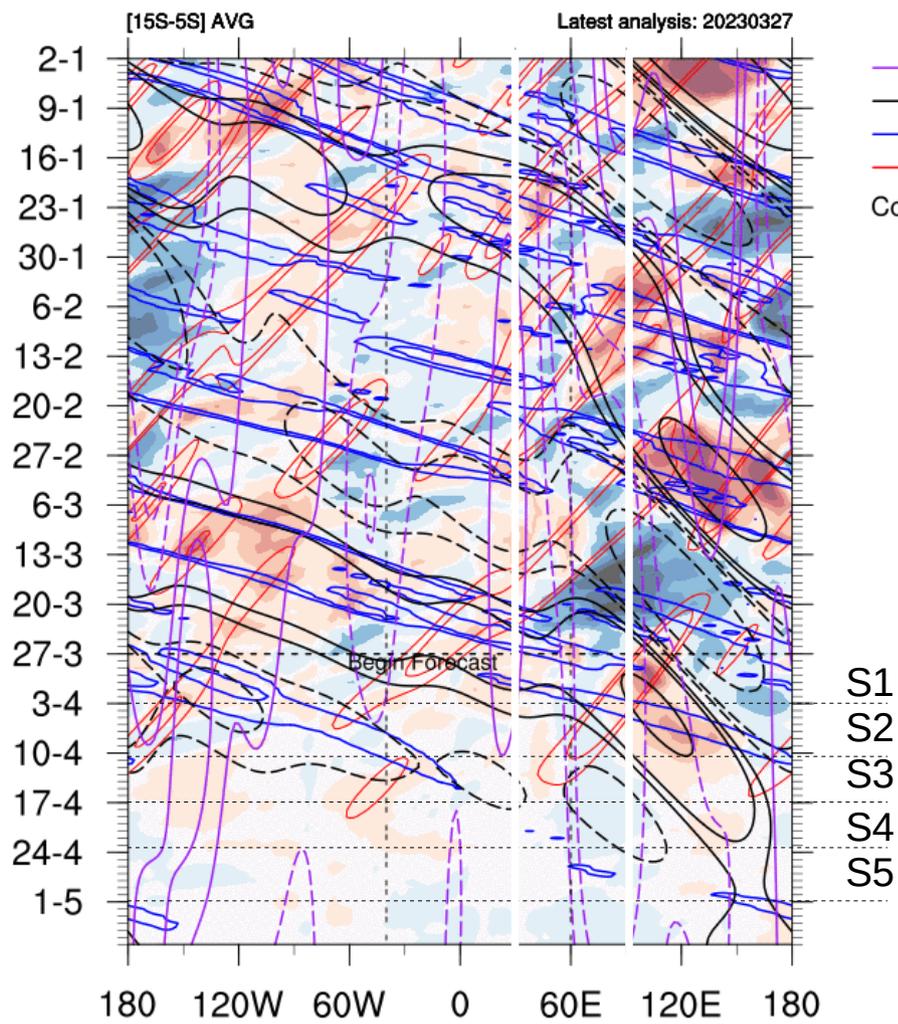
S1
S2
S3
S4
S5

3. Ondes équatoriales

u850 anomaly + Eq. Waves filtering



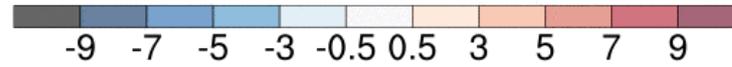
u850 anomaly + Eq. Waves filtering



— Low freq.
— MJO
— Kelvin
— Rossby
 Contours : 0.5 1 3 m s⁻¹



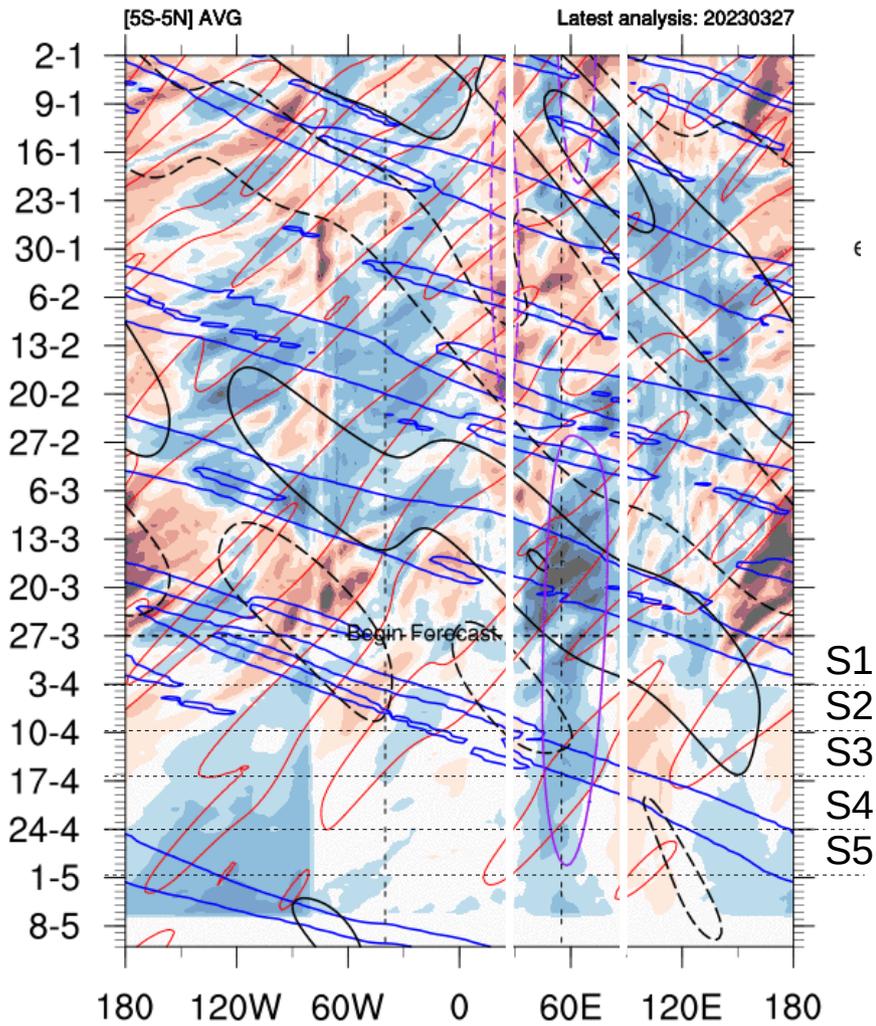
Contact: philippe.peyrille@meteo.fr



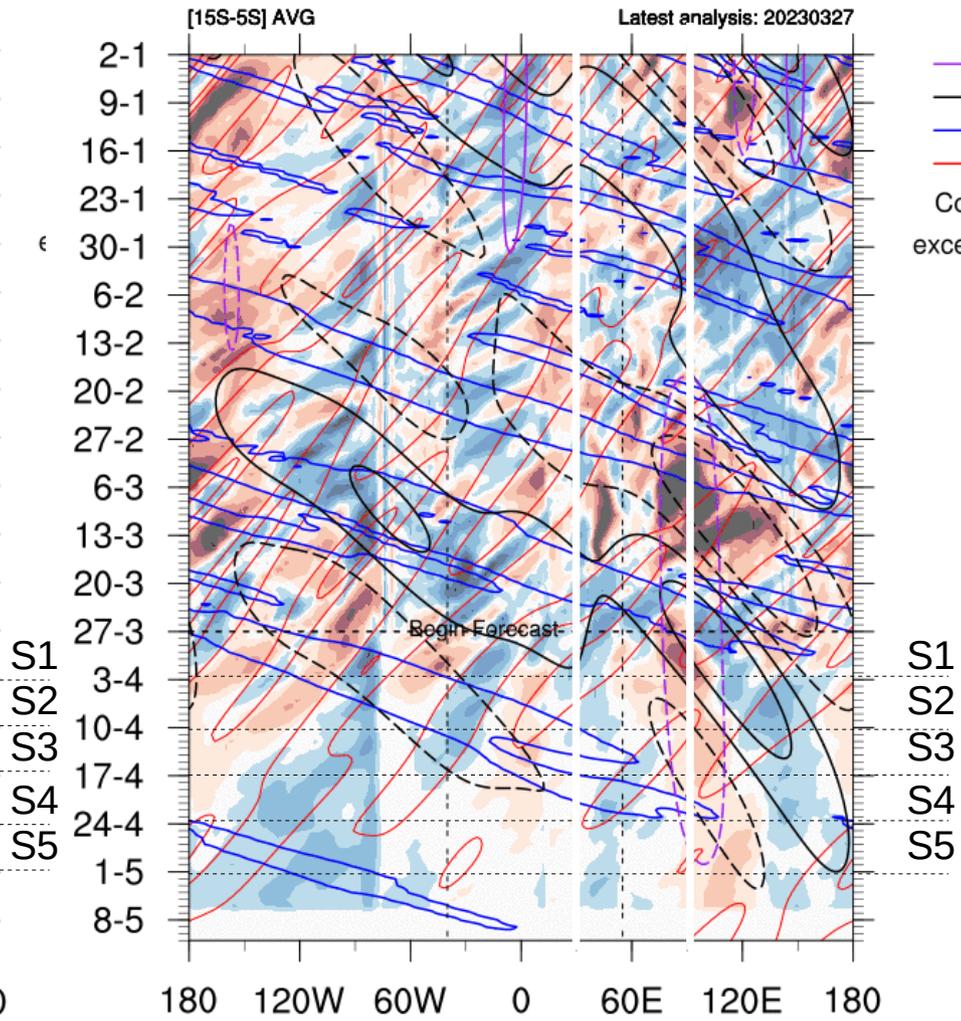
Contact: philippe.peyrille@meteo.fr

3. Ondes équatoriales

TCWV anomaly (mm) + Eq. Waves filtering



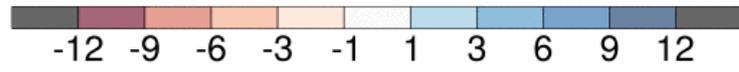
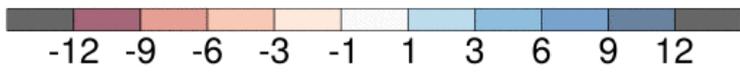
TCWV anomaly (mm) + Eq. Waves filtering



— Low freq.
 — MJO
 — Kelvin
 — Rossby
 Contours : 0.5 3 6 mm
 except Low freq, 3,6, 9 mm

S1
S2
S3
S4
S5

S1
S2
S3
S4
S5

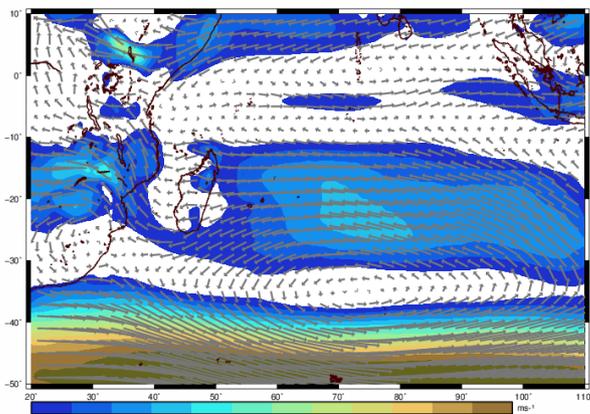


4. Impacts en temps sensible, temps sévère

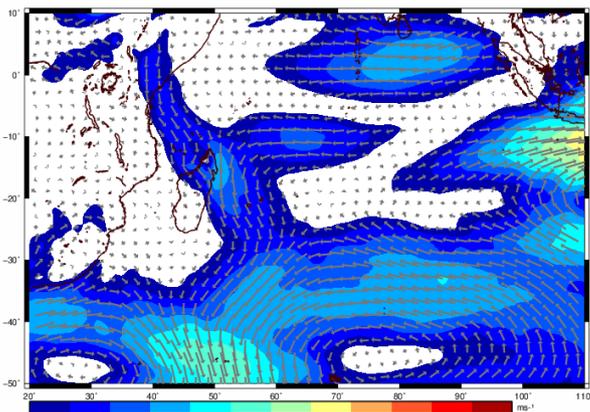
Configuration du bassin

S2

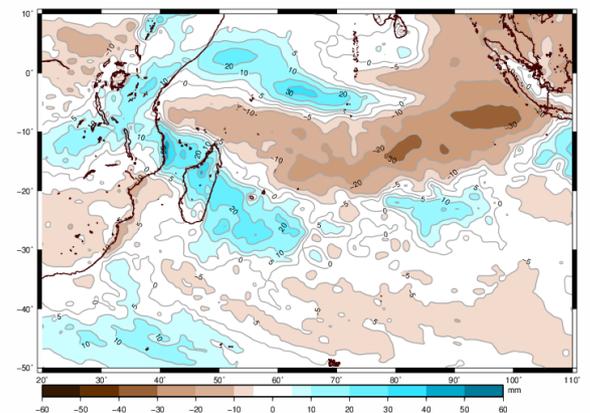
Vent 850hPa
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27



Anomalie force du vent 850hPa
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27

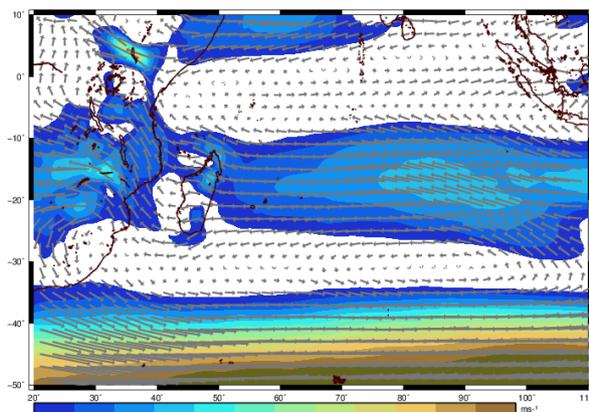


Anomalie de précipitations
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27

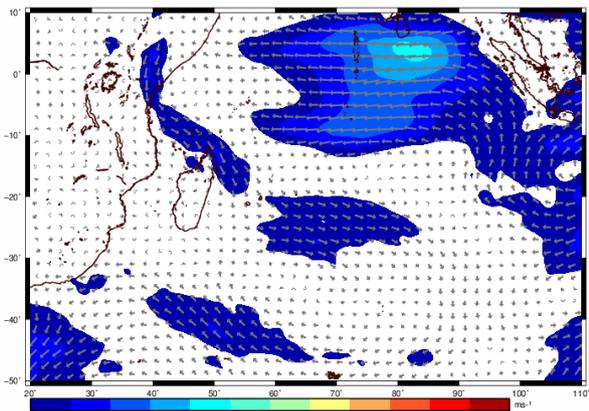


S3

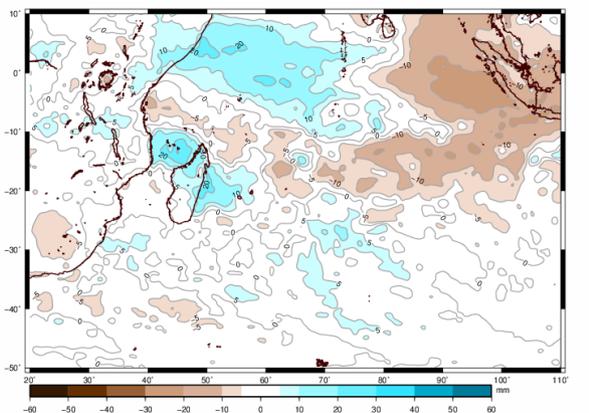
Vent 850hPa
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27



Anomalie force du vent 850hPa
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27

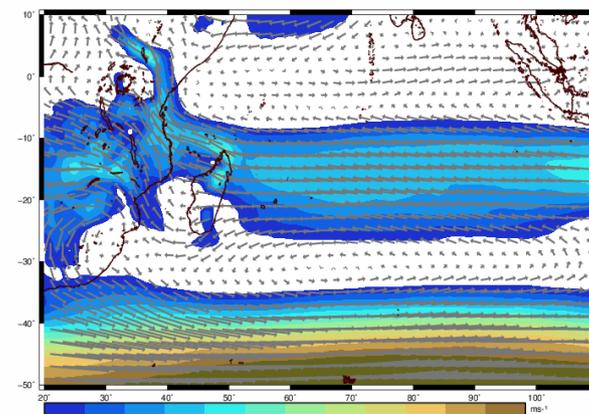


Anomalie de précipitations
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27

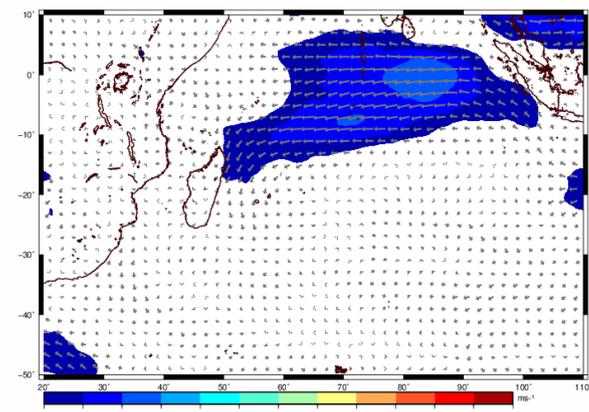


S4

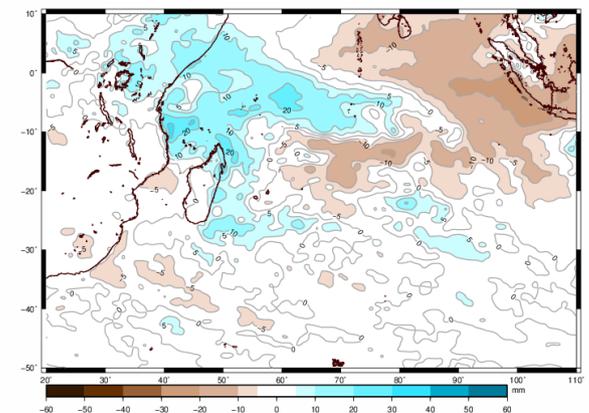
Vent 850hPa
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27



Anomalie force du vent 850hPa
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27



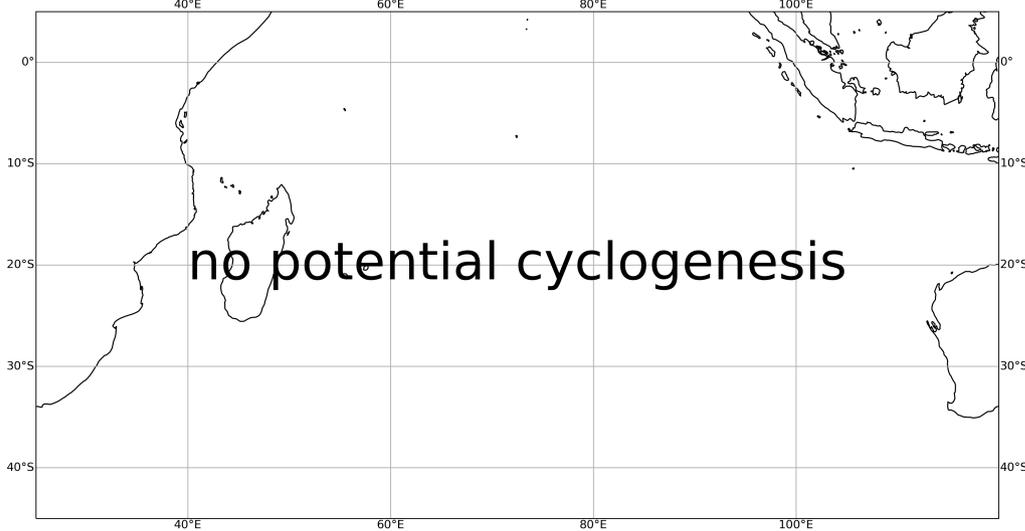
Anomalie de précipitations
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27



Activité cyclonique [S2-S4]

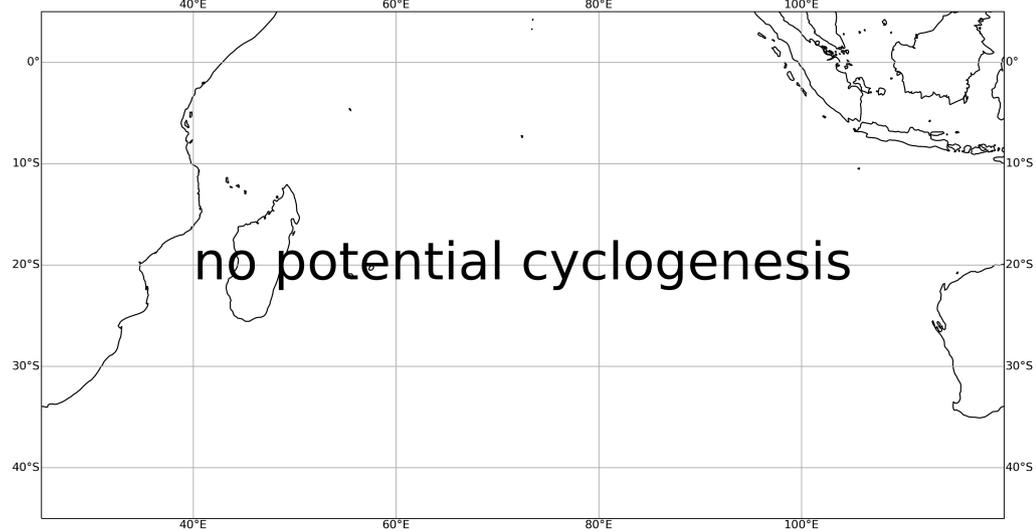
S1

Potential cyclogenesis start areas, from 27-03-2023 to 03-04-2023, run:27-03-2023



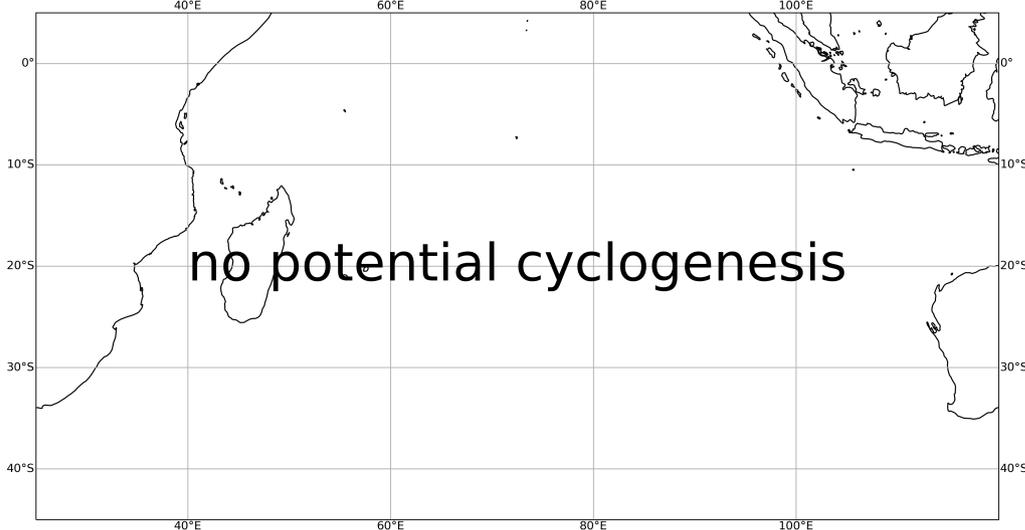
S2

Potential cyclogenesis start areas, from 03-04-2023 to 10-04-2023, run:27-03-2023



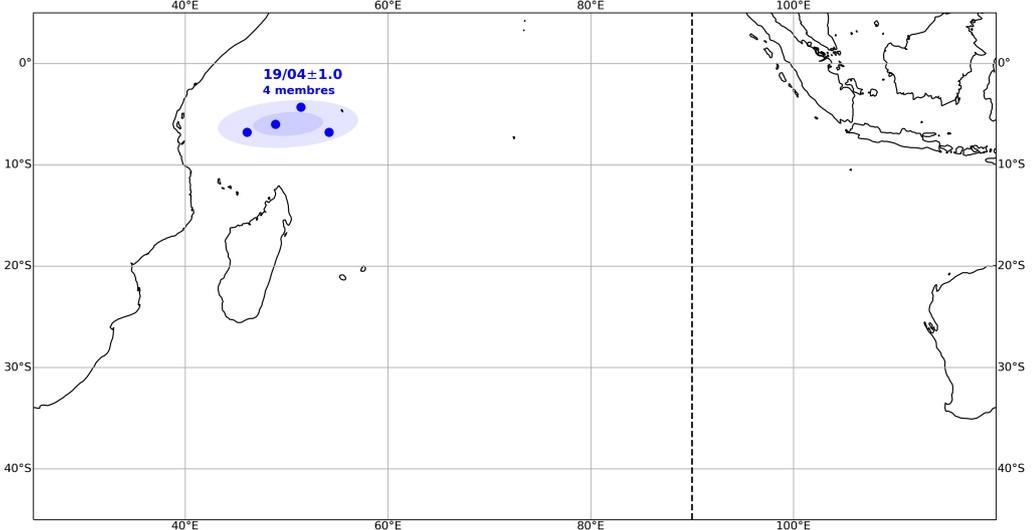
S3

Potential cyclogenesis start areas, from 10-04-2023 to 17-04-2023, run:27-03-2023

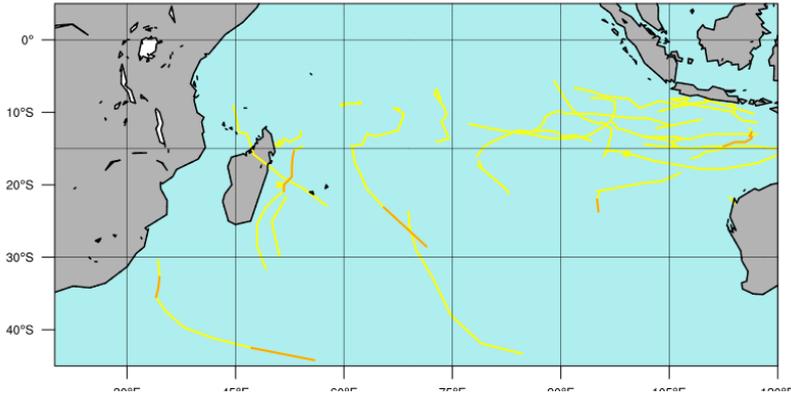


S4

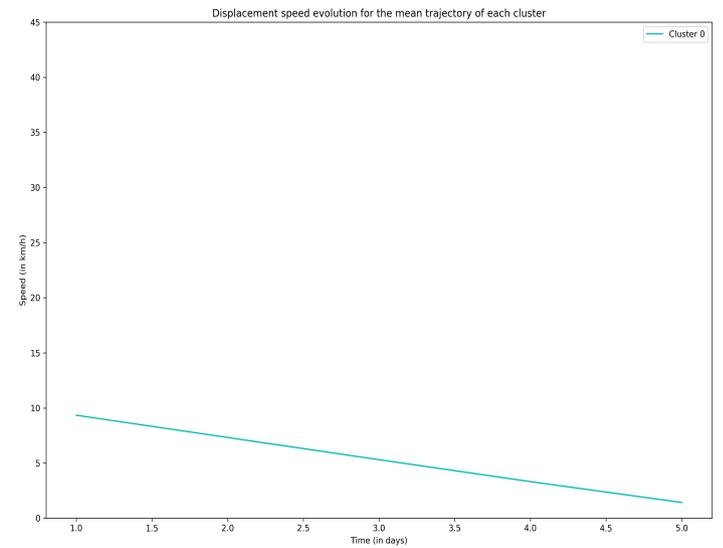
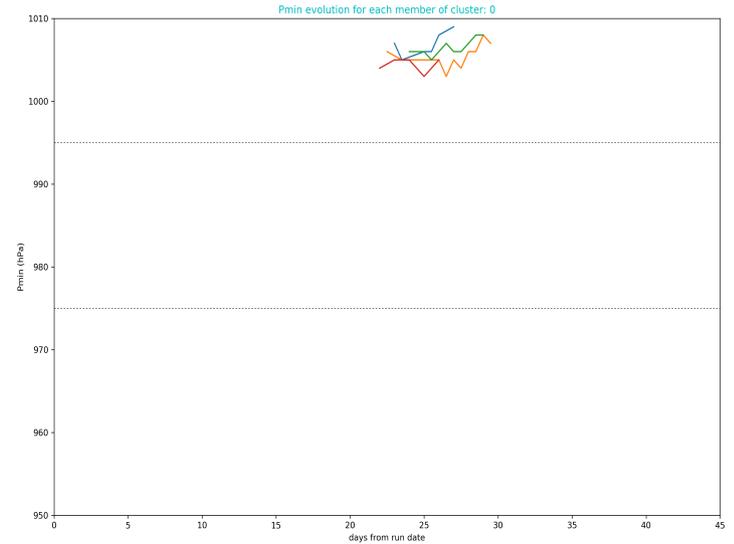
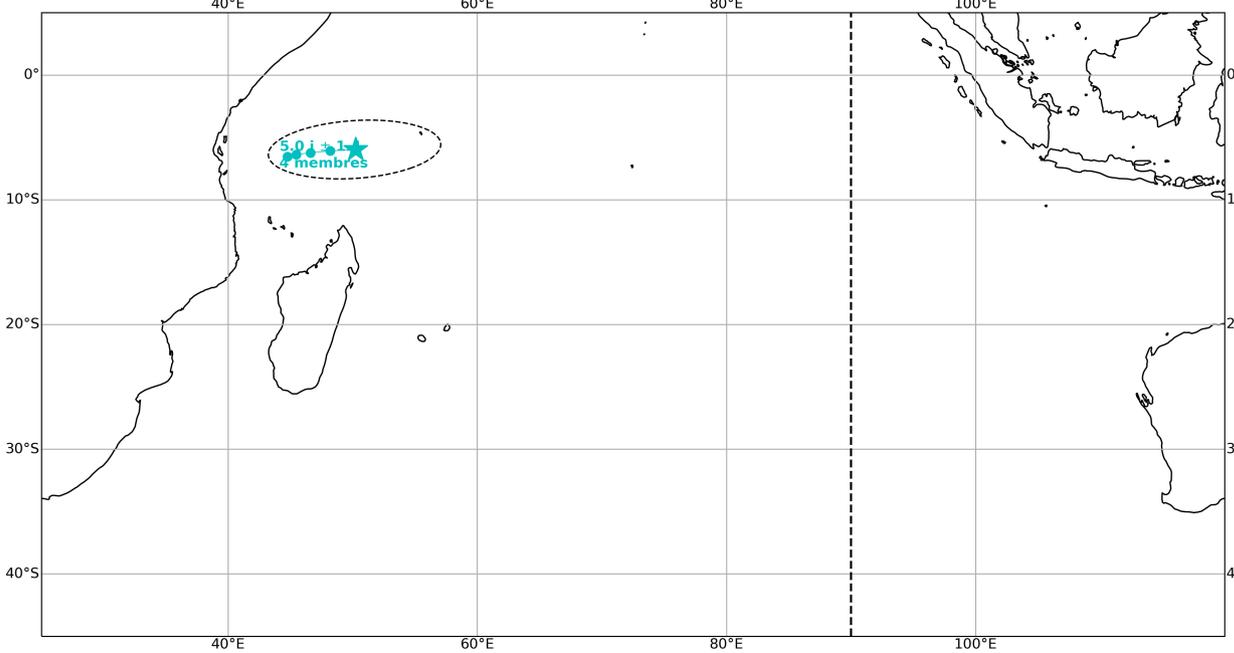
Potential cyclogenesis start areas, from 17-04-2023 to 24-04-2023, run:27-03-2023



Activité cyclonique [S4]

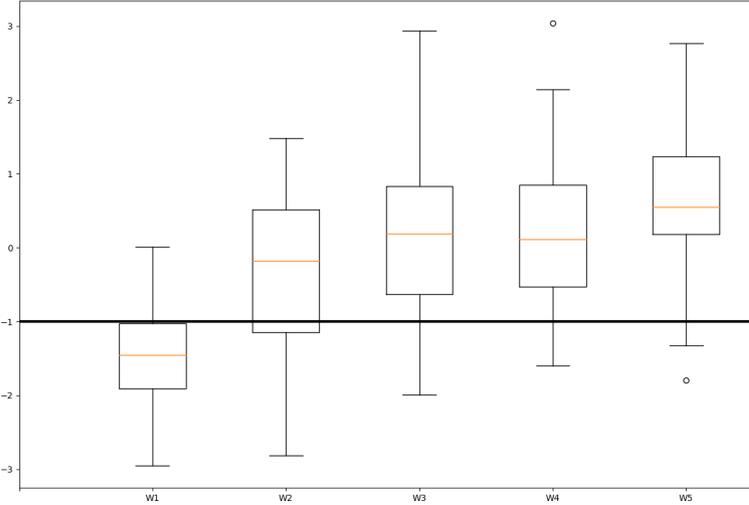


Trajectory scenarios for potential cyclogenesis starting on 19/04, run: 27-03-2023

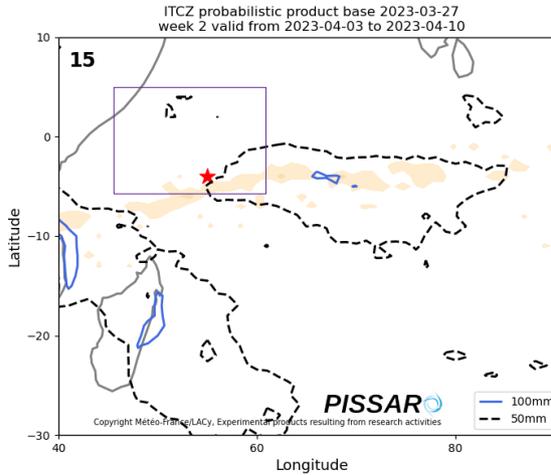


Configuration du bassin et prévision ZCIT

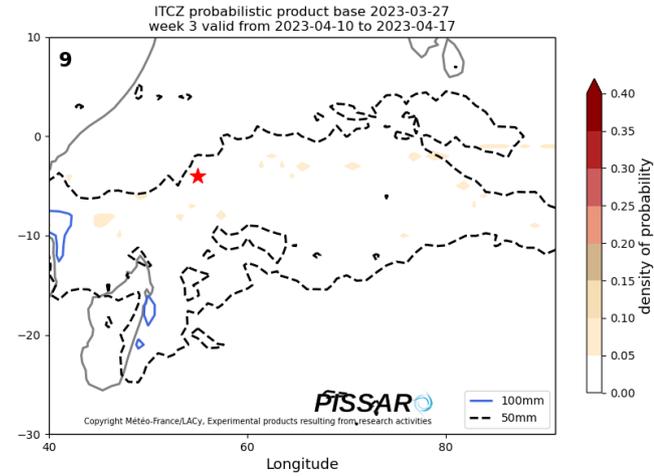
Monsoon Flux Index Monthly Forecast
base 2023-03-27



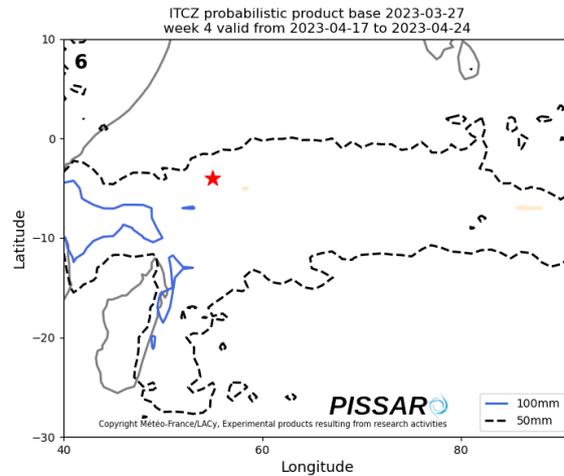
S2



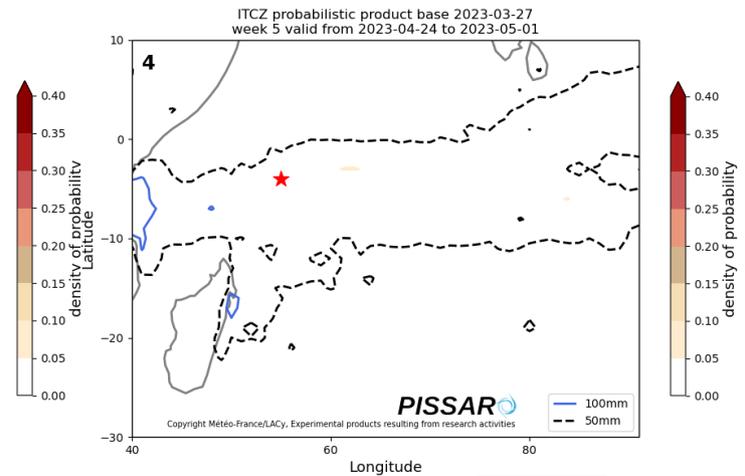
S3



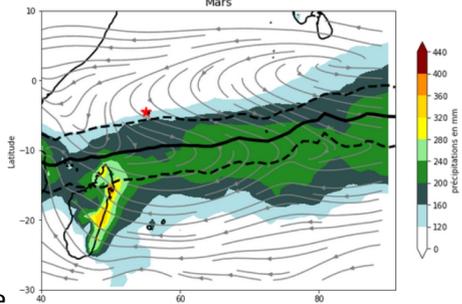
S4



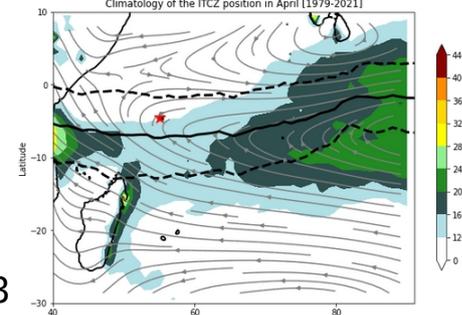
S5



Mars

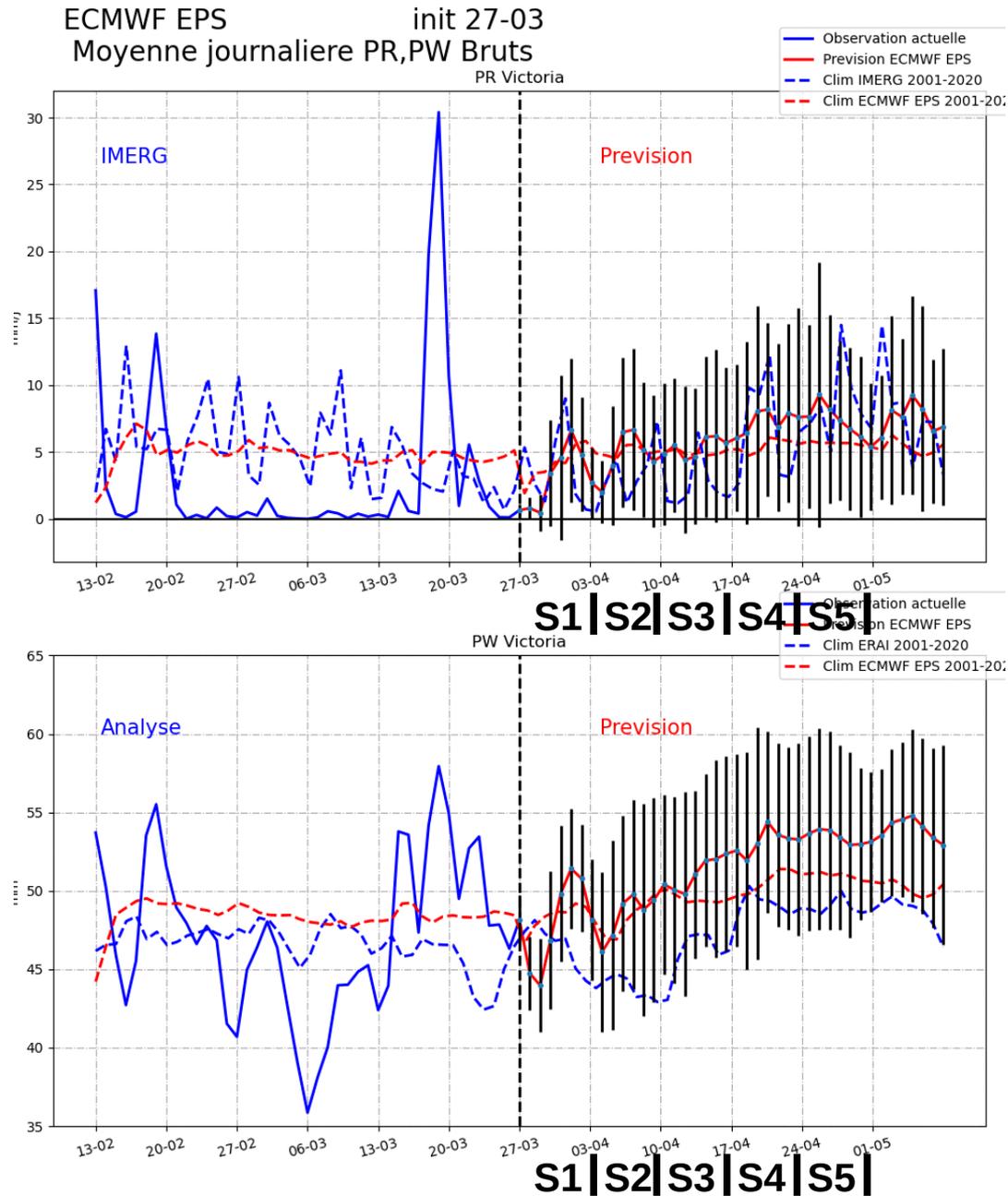


Climatology of the ITCZ position in April (1979-2021)



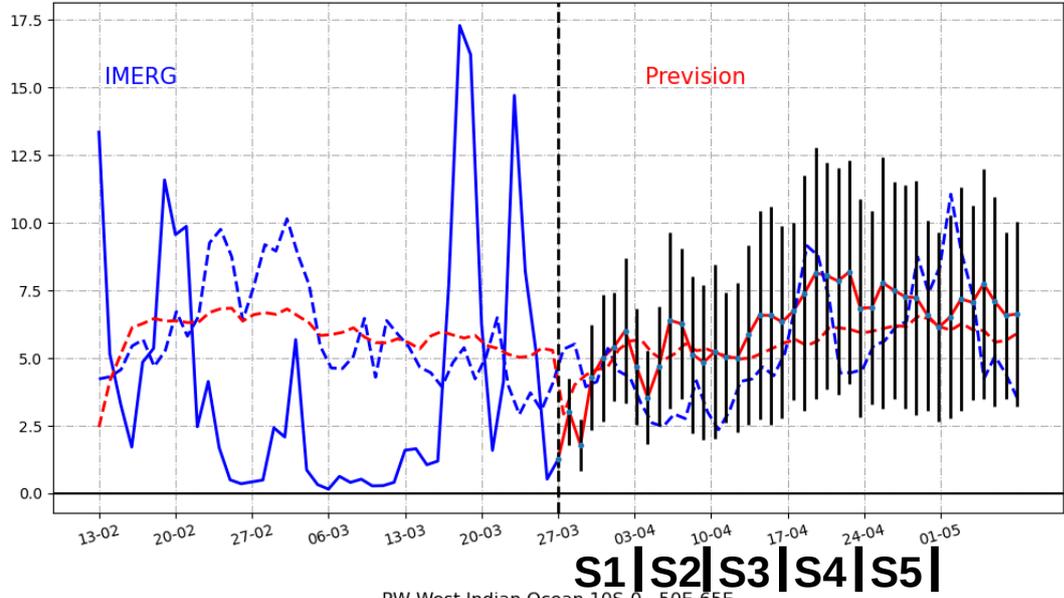
Climatologie
mensuelle

Synthèse temps sensible S2 – S4 [SEYCHELLES]

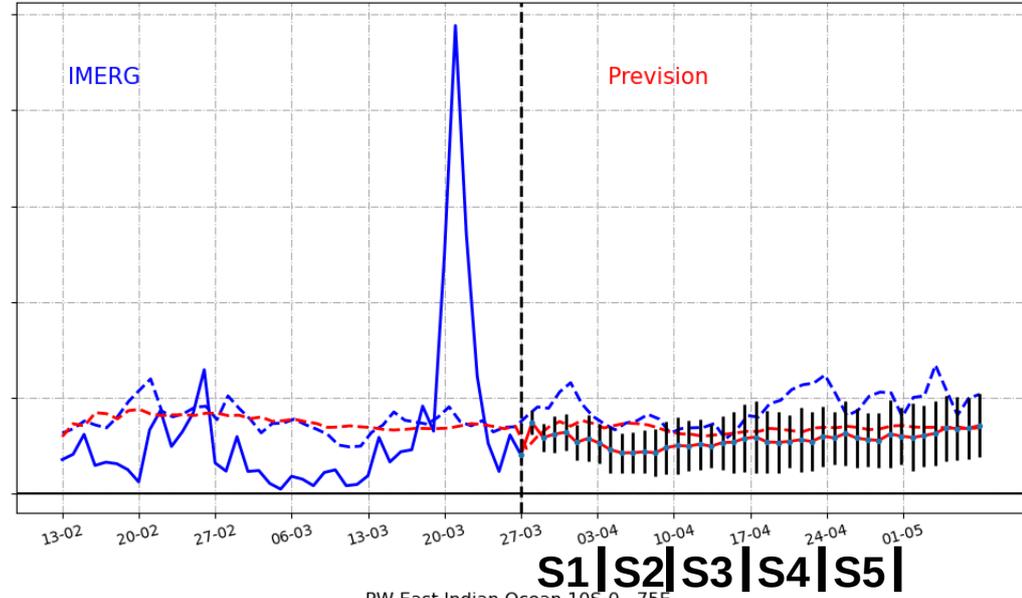


Synthèse temps sensible S2 – S4 [SEYCHELLES]

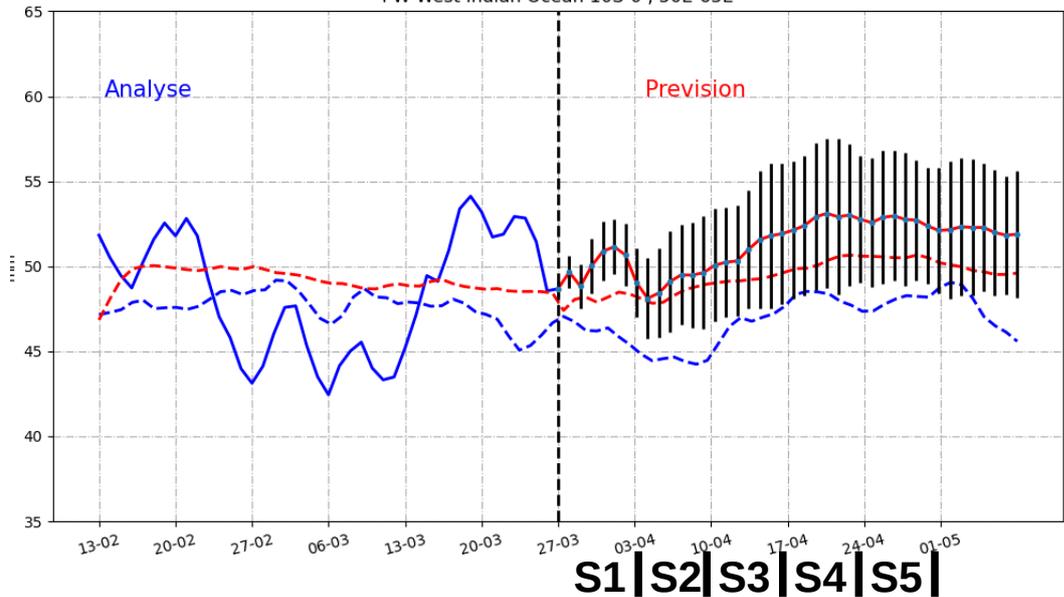
ECMWF EPS
Moyenne journaliere PR,PW Bruts
PR West Indian Ocean 10S-0 , 50E-65E
init 27-03



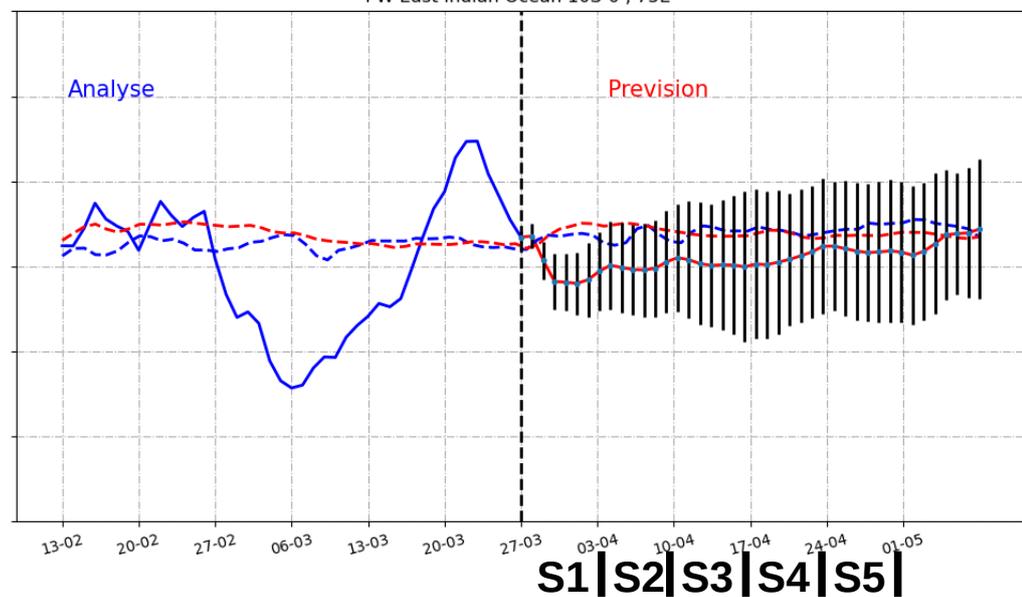
ECMWF EPS
Moyenne journaliere PR,PW Bruts
PR East Indian Ocean 10S-0 , 75E-95E
init 27-03



PW West Indian Ocean 10S-0 , 50E-65E



PW East Indian Ocean 10S-0 , 75E-95E



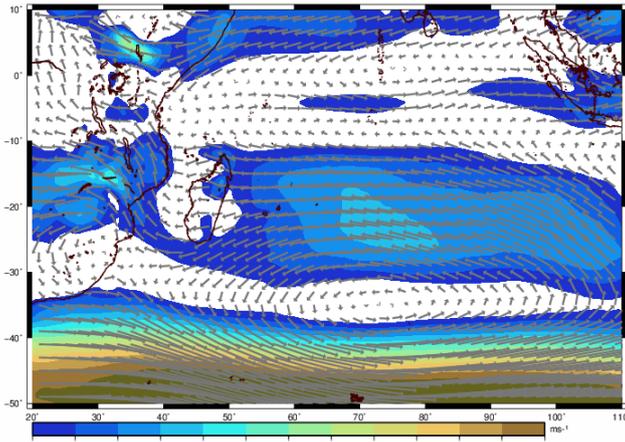
Synthèse temps sensible S2 – S4 [MAYOTTE]

S2

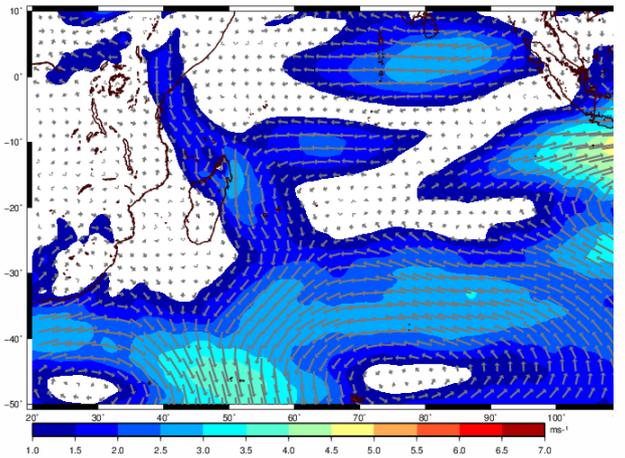
S3

S4

Vent 850hPa
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27

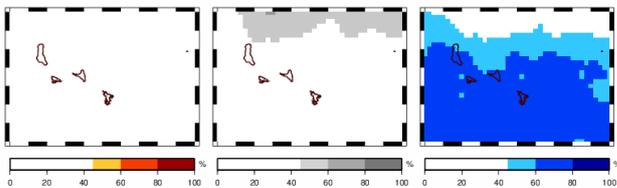


Anomalie force du vent 850hPa
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27

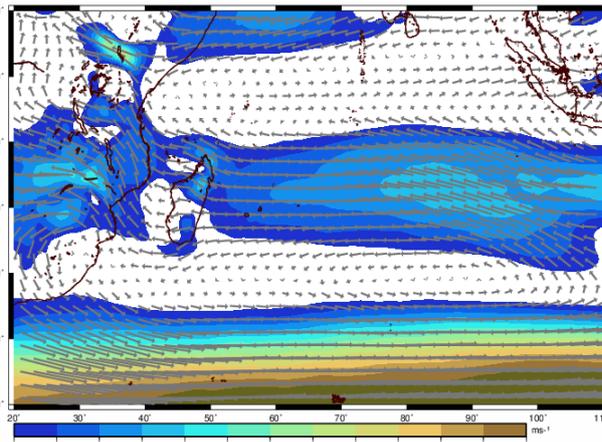


Probabilité tercile des précipitations
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27

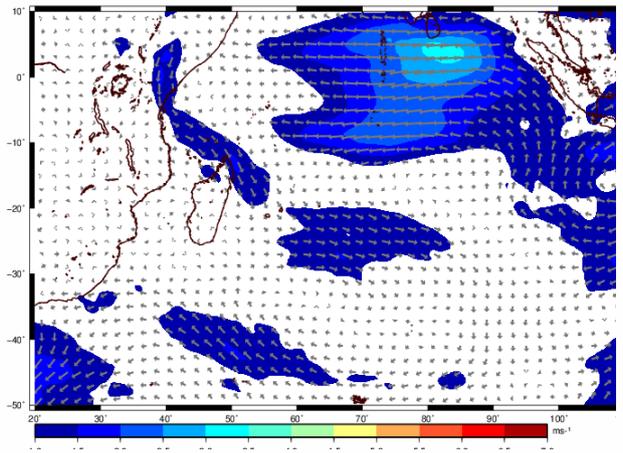
Terc. Inf Terc. Med Terc. Sup



Vent 850hPa
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27

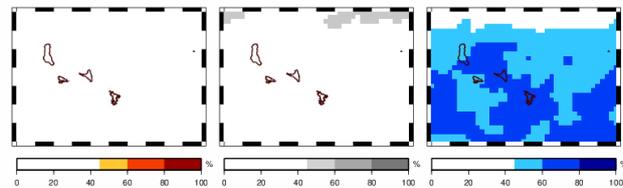


Anomalie force du vent 850hPa
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27

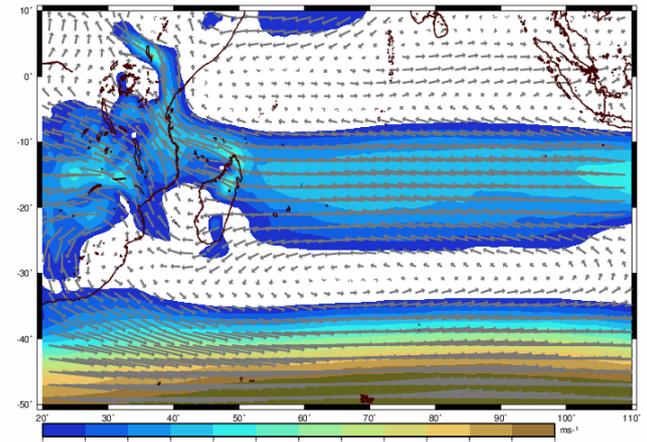


Probabilité tercile des précipitations
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27

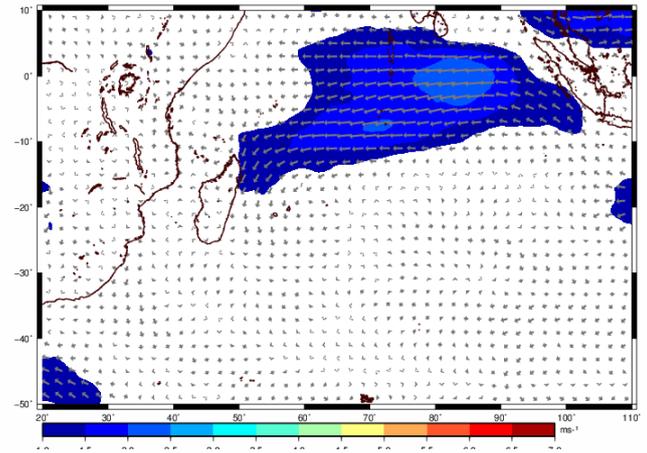
Terc. Inf Terc. Med Terc. Sup



Vent 850hPa
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27

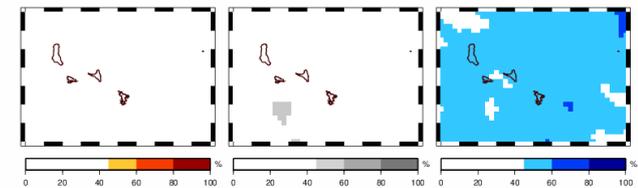


Anomalie force du vent 850hPa
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27



Probabilité tercile des précipitations
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27

Terc. Inf Terc. Med Terc. Sup



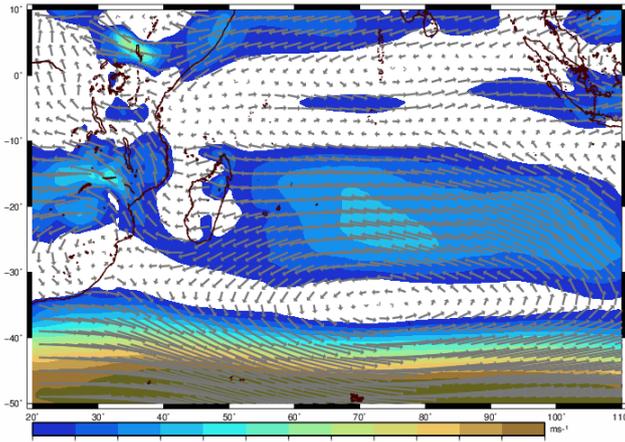
Synthèse temps sensible S2 – S4 [LA REUNION]

S2

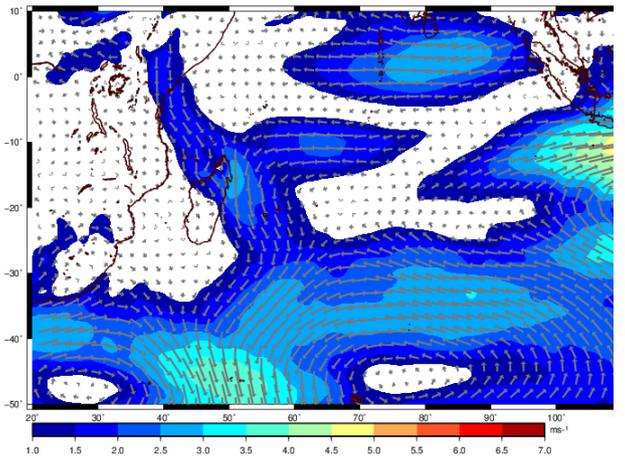
S3

S4

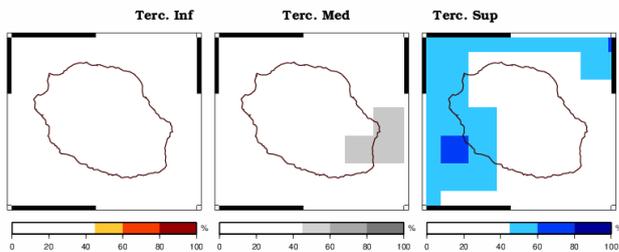
Vent 850hPa
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27



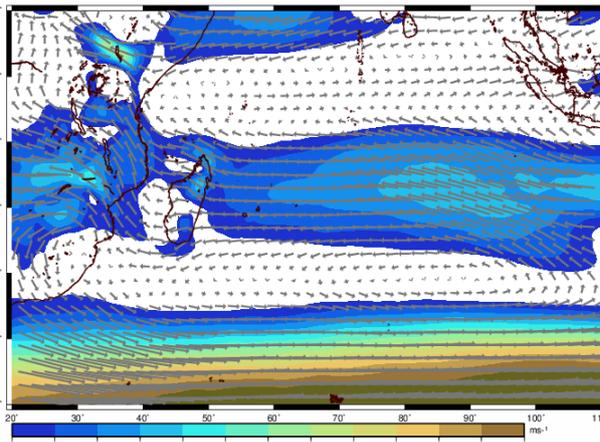
Anomalie force du vent 850hPa
période du 2023-04-03 au 2023-04-10
Prévision mensuelle CEPMMT base 2023-03-27



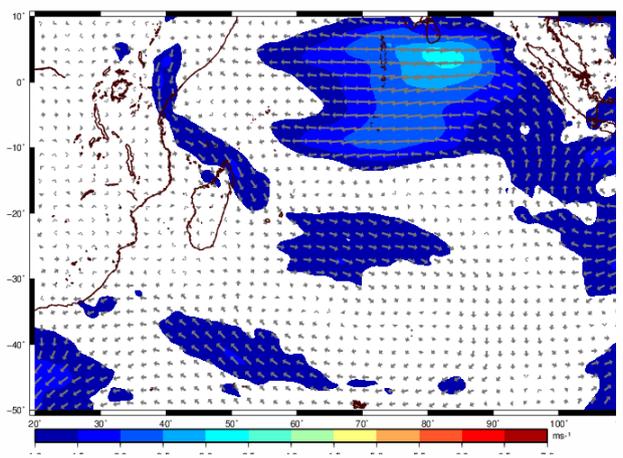
Probabilité tercile des précipitations
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Prévision mensuelle CEPMMT base 2023-03-27



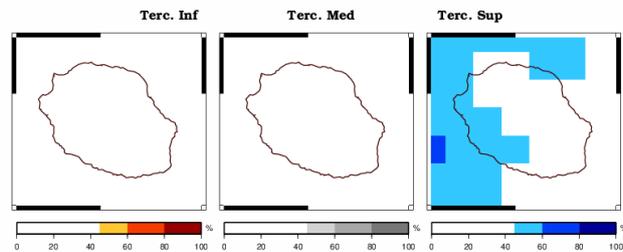
Vent 850hPa
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27



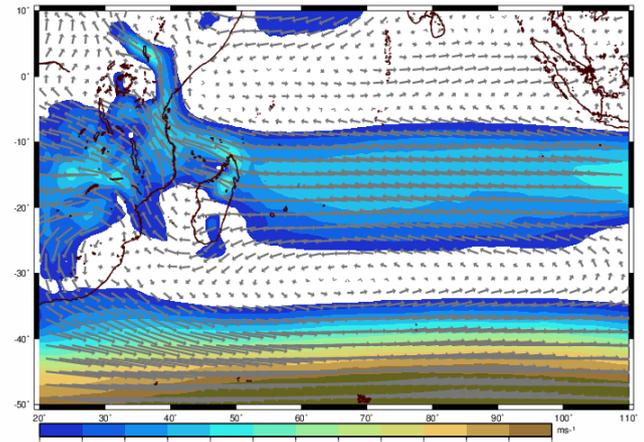
Anomalie force du vent 850hPa
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27



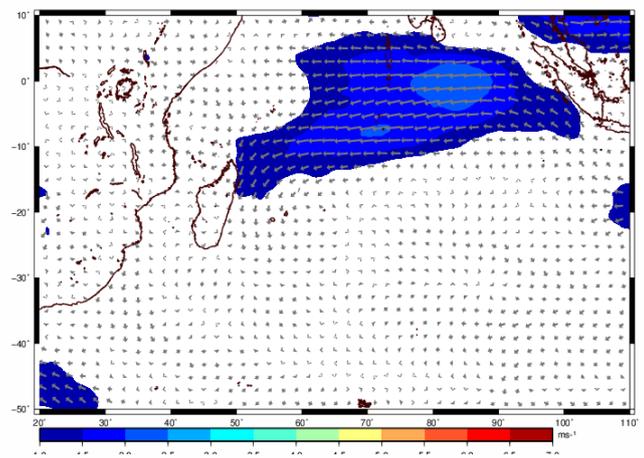
Probabilité tercile des précipitations
période du 2023-04-10 au 2023-04-17
Prévision mensuelle CEPMMT base 2023-03-27



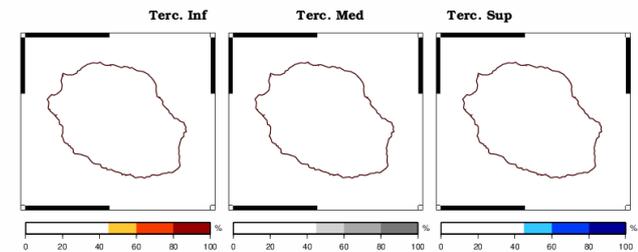
Vent 850hPa
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Prévision mensuelle CEPMMT base 2023-03-27



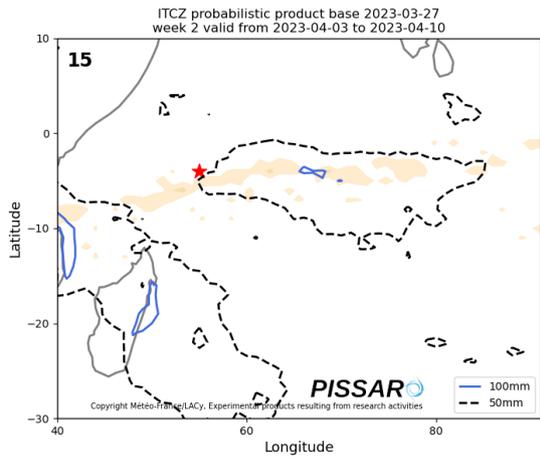
Anomalie force du vent 850hPa
période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27



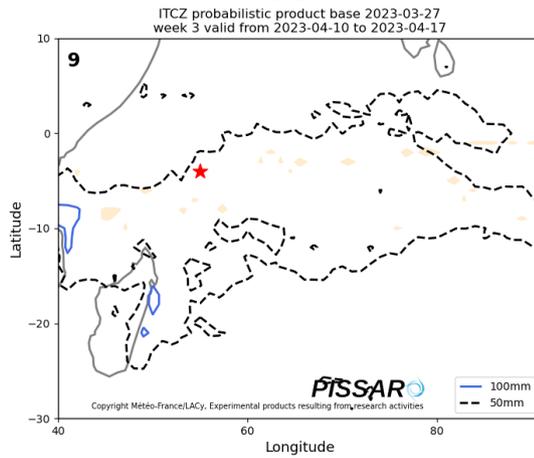
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période du 2023-04-17 au 2023-04-24
Prévision mensuelle CEPMMT base 2023-03-27



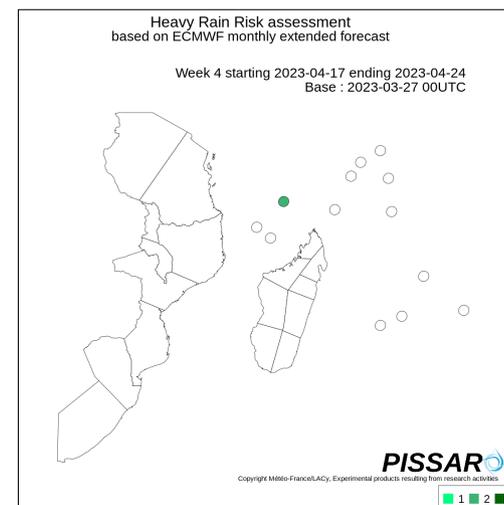
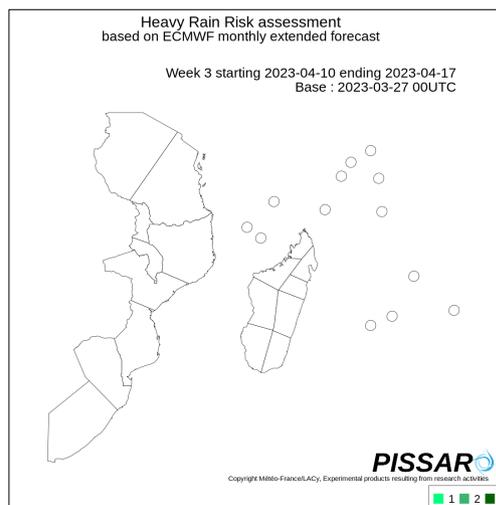
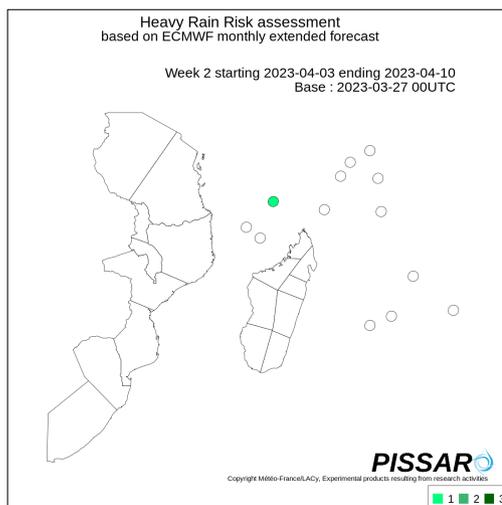
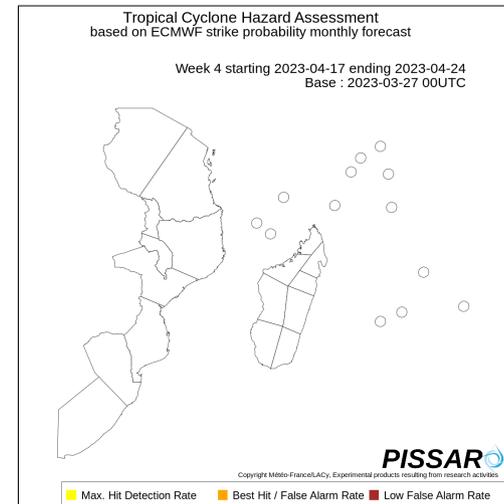
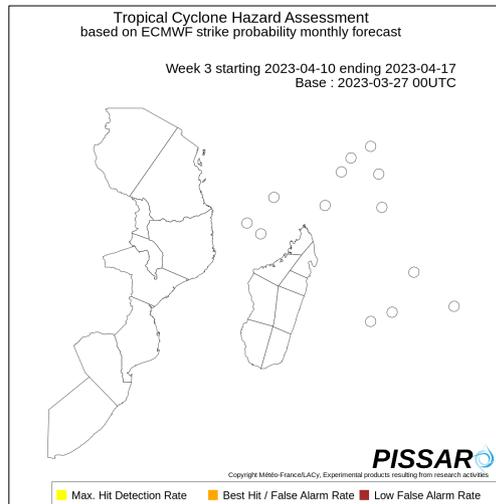
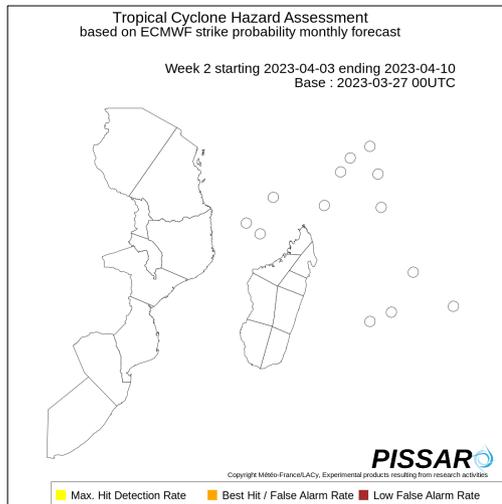
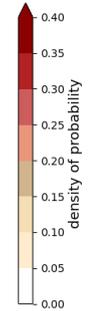
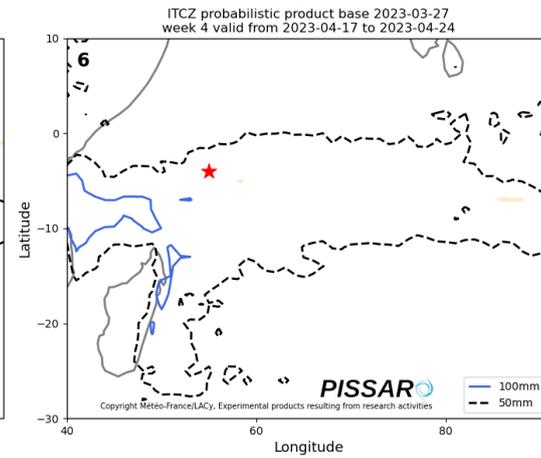
S2



S3



S4





Briefing mensuel

Suivi MJO et ondes équatoriales pour le bassin SOOI

Sources :

<http://www.bom.gov.au/climate/enso/>

<http://seasonal.meteo.fr/sites/data/Modeles/>

<https://cds.climate.copernicus.eu/#!/home>

<http://regionalclimate-change.sc/swiocof/SST/>

<http://intra.cnrm.meteo.fr/moana/tropiques/images/>

<https://www.cpc.ncep.noaa.gov/products/>

<https://ncics.org/pub/mjo/v2/map/>

<http://rewebvirt.dirre.meteo.fr/clim/PreviMens/>

https://apps.ecmwf.int/plots/product-download/mofc_multi/mofc_multi_tcyc_family_forecast/

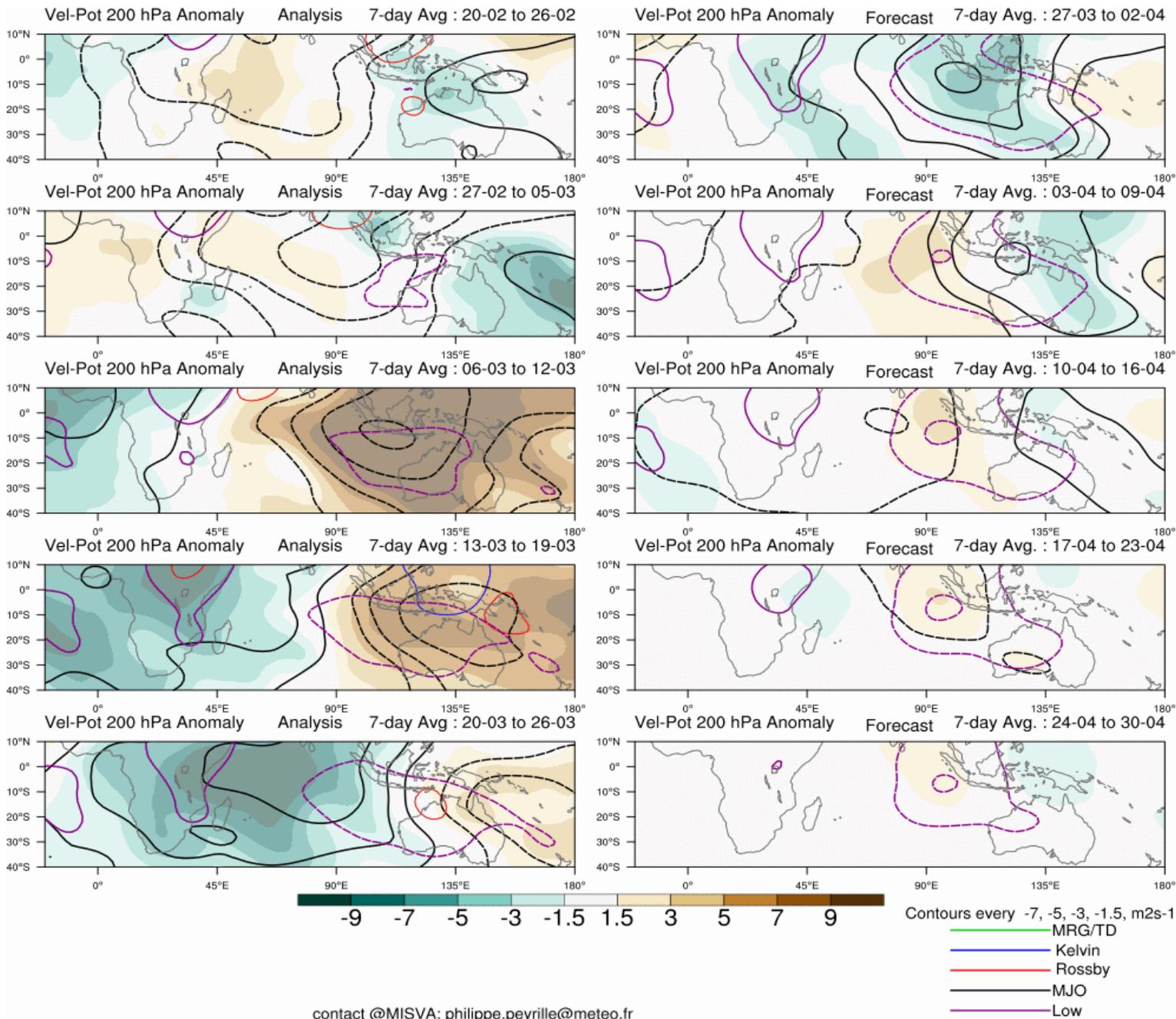
<http://mikeventrice.weebly.com/mjo.html>

http://www.atmos.albany.edu/student/ventrice/real_time/

<https://misva.aeris-data.fr/products/>

VP200 – MJO, ER dans l'Indien

Analyse



S1 à S4

S1

S2

S3

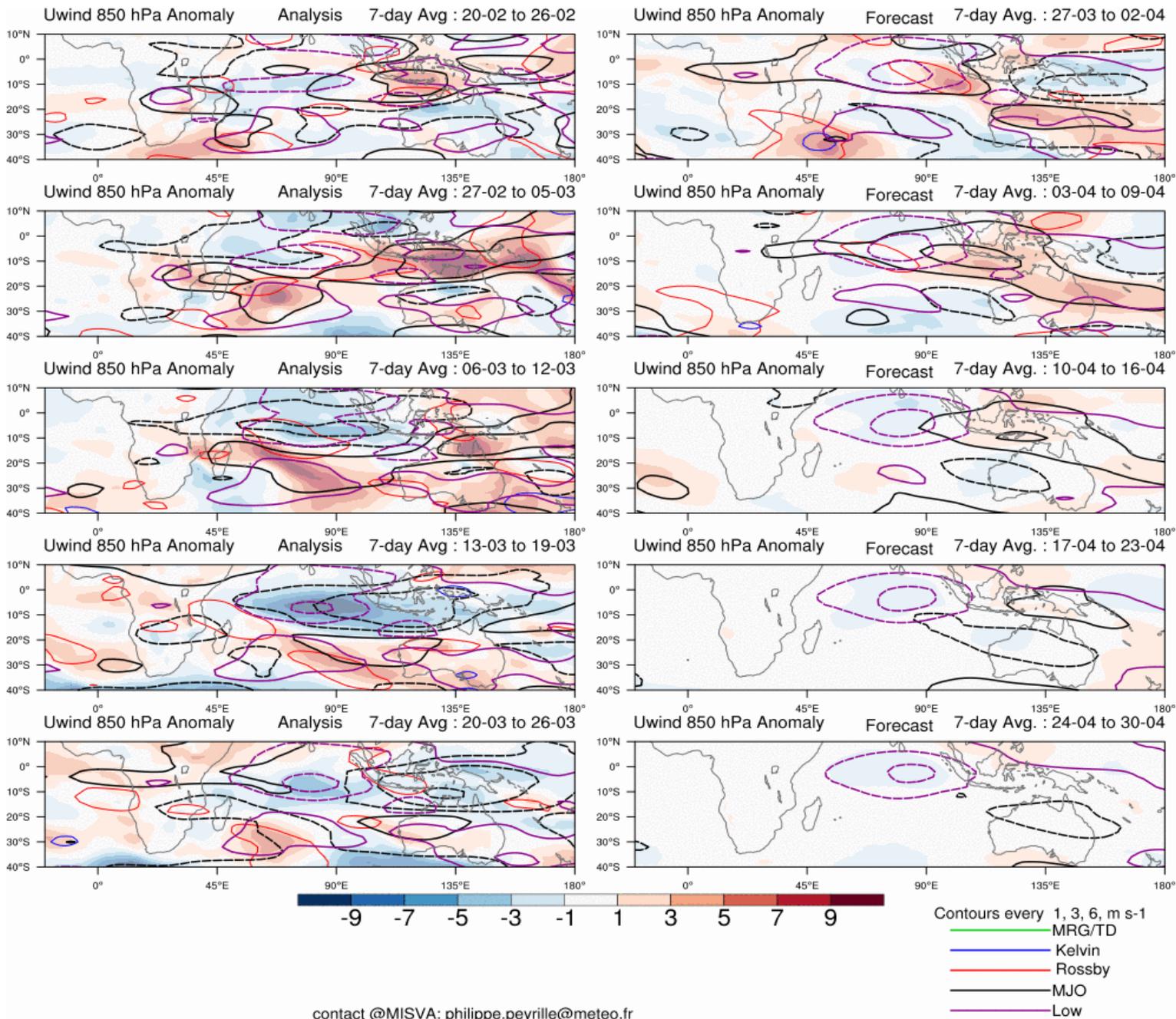
S4

S5



U850 – MJO, ER dans l'Indien

Analyse



S1 à S4

S1

S2

S3

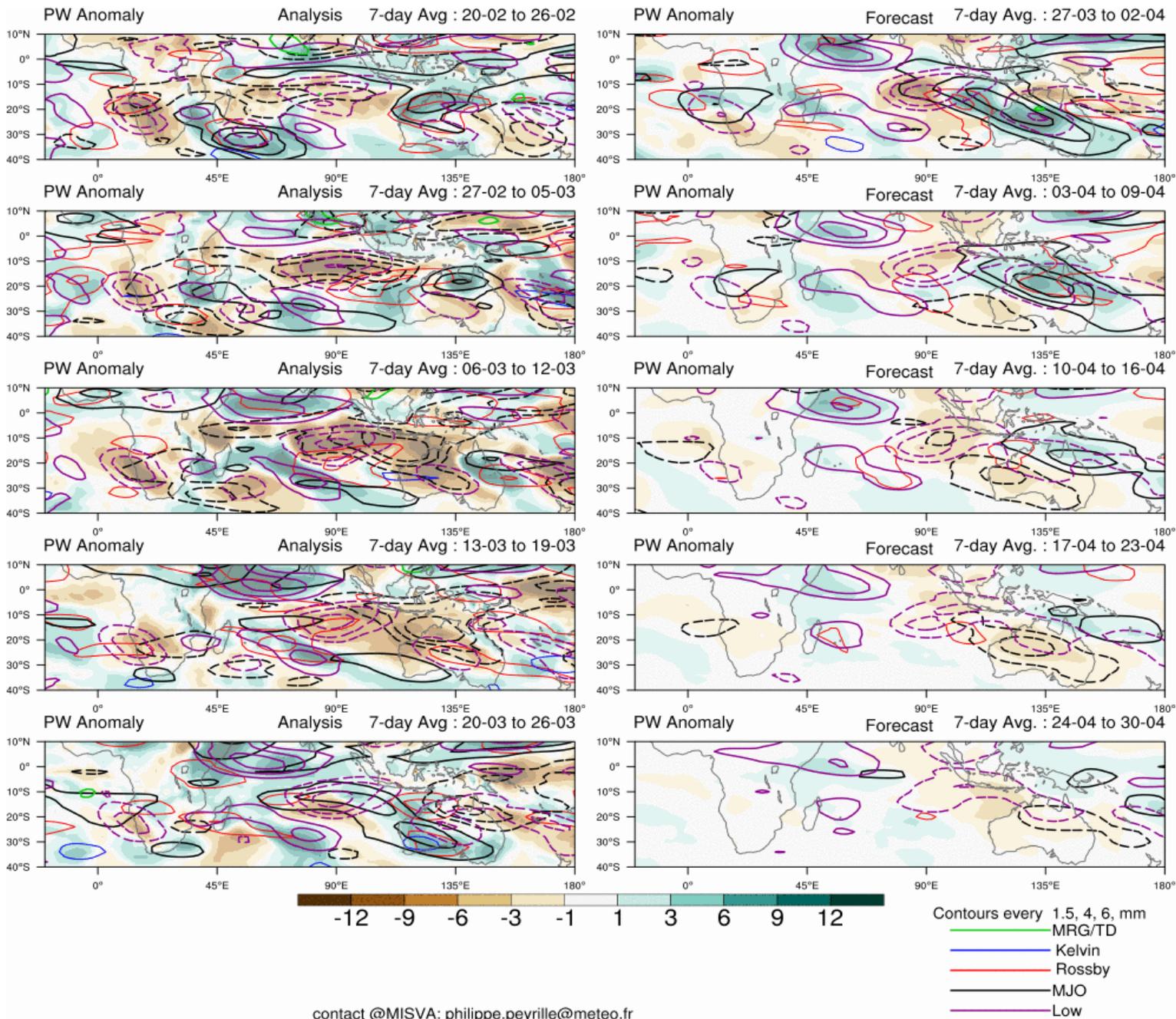
S4

S5



PW – MJO, ER dans l'Indien

Analyse



S1 à S4

S1

S2

S3

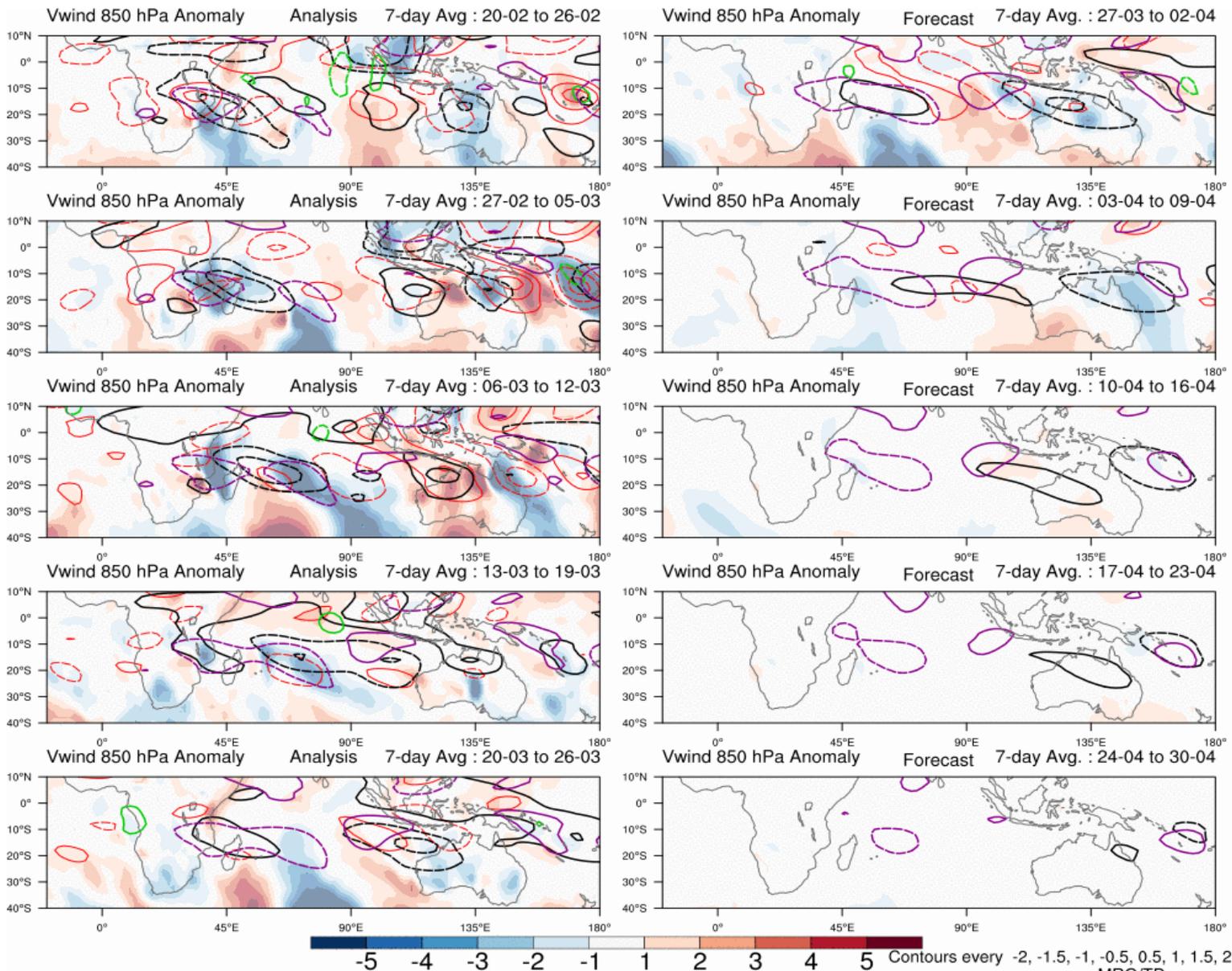
S4

S5



V850 – MJO, ER dans l'Indien

Analyse



S1 à S4

S1

S2

S3

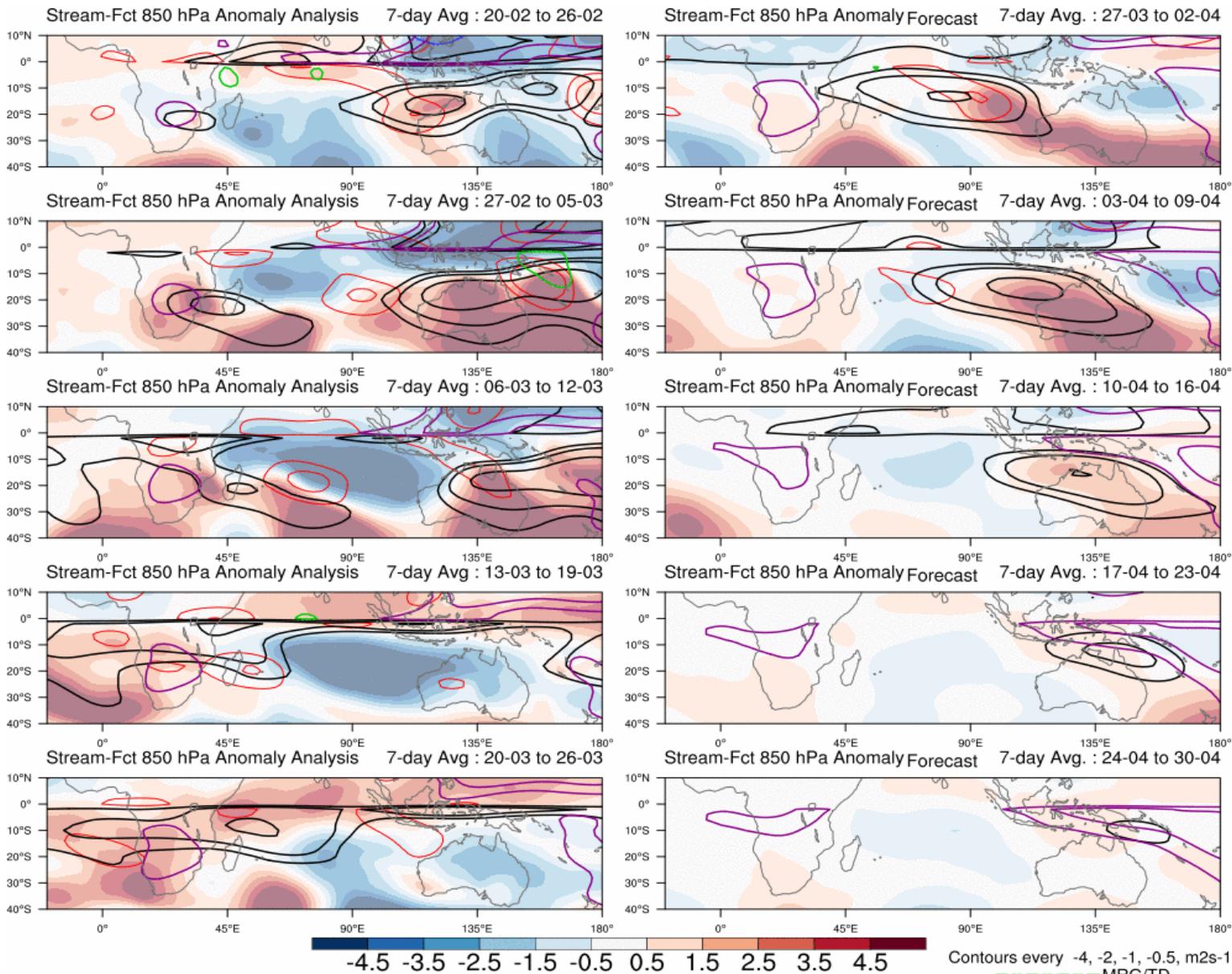
S4

S5



SF850 – MJO, ER dans l'Indien

Analyse



S1 à S4

S1

S2

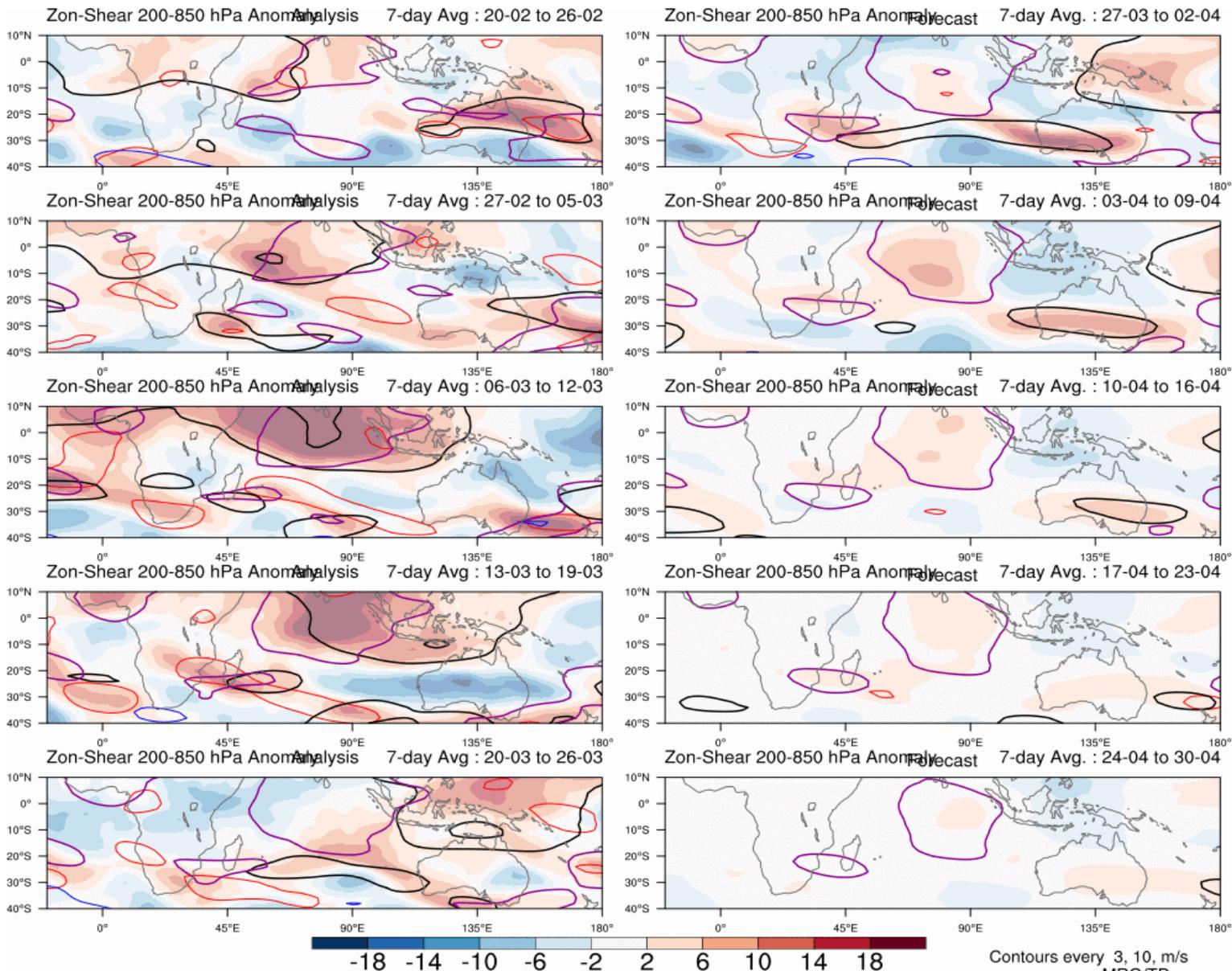
S3

S4

S5

U_{shear} – MJO, ER dans l'Indien

Analyse



S1 à S4

S1

S2

S3

S4

S5

