

# Briefing mensuel

## Suivi MJO et ondes équatoriales pour le bassin SOOI

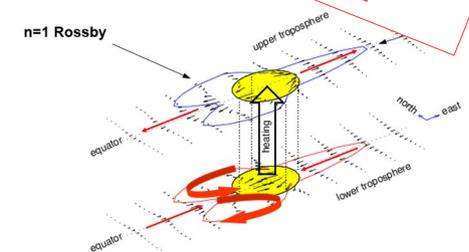
**DATE : 15/12/2022**

H. Vérèmes, S. Langlade, E. Kapikian et P. Peyrillé

support produit le 13/12/2022  
sur bulletin ECMWF du 12/12  
et figures du 12/12

**S1 : 12 déc.-18 déc.**  
**S2 : 19 déc.-25 déc.**  
**S3 : 26 déc.-01 janv.**  
**S4 : 02 janv.-08 janv.**  
**S5 : 09 janv.-15 janv.**

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



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# Introduction

# Retour sur les prévisions d'activité cyclonique du briefing 2

« Activité cyclonique (stade tempête ou plus) très peu probable (< 5%) de S2 à S4 sur l'ensemble du bassin »

S2: 21 nov. au 27 nov.

S3: 28 nov. au 04 déc.

S4: 05 déc. au 11 déc.

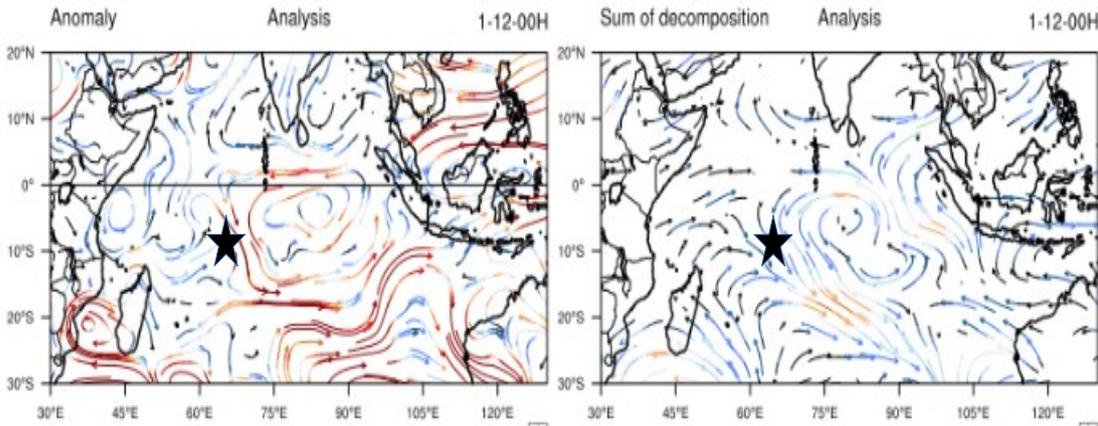
Date_init	lat_ini (°S)	lon_ini(°E)	Pos initiale	Date_cyclogenese	lat_cyc(°S)	lon_cyc(°E)	Pos cyclogenèse	Commentaires
13/11/22	9	94	9S/94E					Précurseur formé Est 90E en zone indonésienne (94S Invest) puis se dissipe à partir du 20/11 au Sud de Bali puis au Nord-Ouest de l'Australie
01/12/22	9.5	65.7	9.5S/65.7E					Ne dépasse pas le stade de ZP. Suivie jusqu'au 08/12 par 8°S et 58°E
10/12/22	10	102	10S/102E					Précurseur formé à la frontière de la zone indonésienne et australienne.

→ Aucune tempête formée sur tout le Sud Indien

→ Formation de 3 précurseurs (1 en cours lors du dernier briefing mais à l'Est de 90°E et 1 en cours actuellement à l'Est de 90°E)

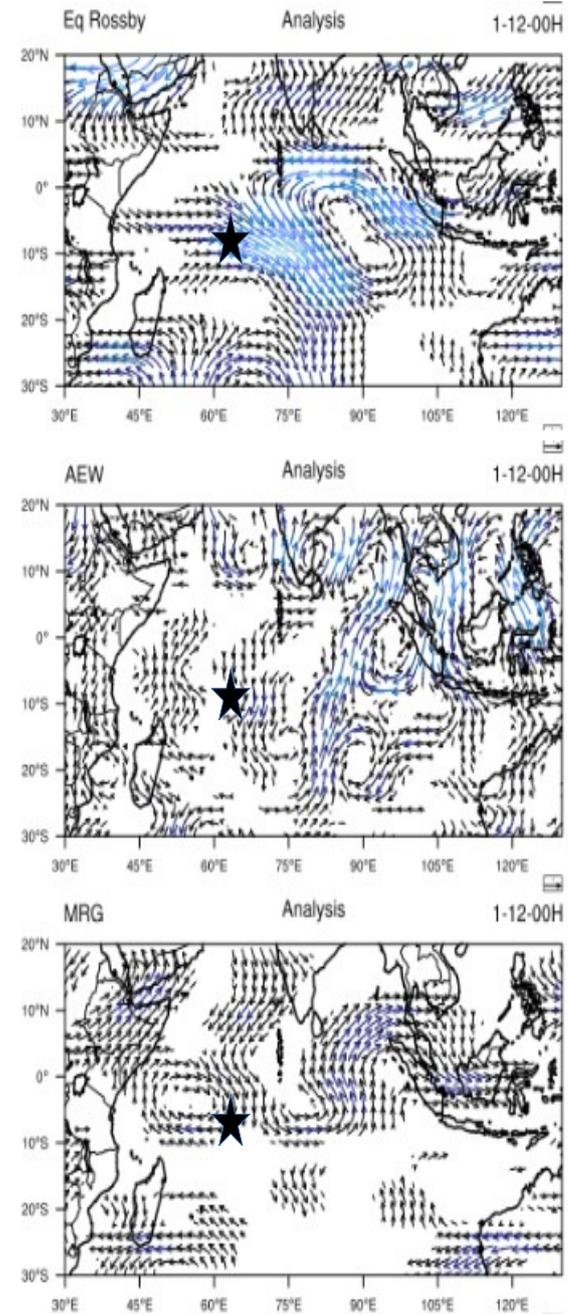
# Retour sur l'origine de la genèse des 2 derniers précurseurs

## Ano vents 850 hPa



## Précurseur du 1<sup>er</sup> décembre

- situation des vents de basses couches dans la zone proche équatoriale pilotée par ER principalement mais aussi MRG/AEW
- anomalies de vents de Nord à Nord-Ouest dans la bande 0-10°S sur la face Ouest d'un gyre anticyclonique qu'on retrouve bien dans la décomposition ER.
- Pas de modulation en PW
- Pourquoi pas de dév. ? Hypothèse : manque de convergence de basses couches côté Sud et PW insuffisant, puis hausse cisaillement d'Ouest à partir du 03/04 déc.

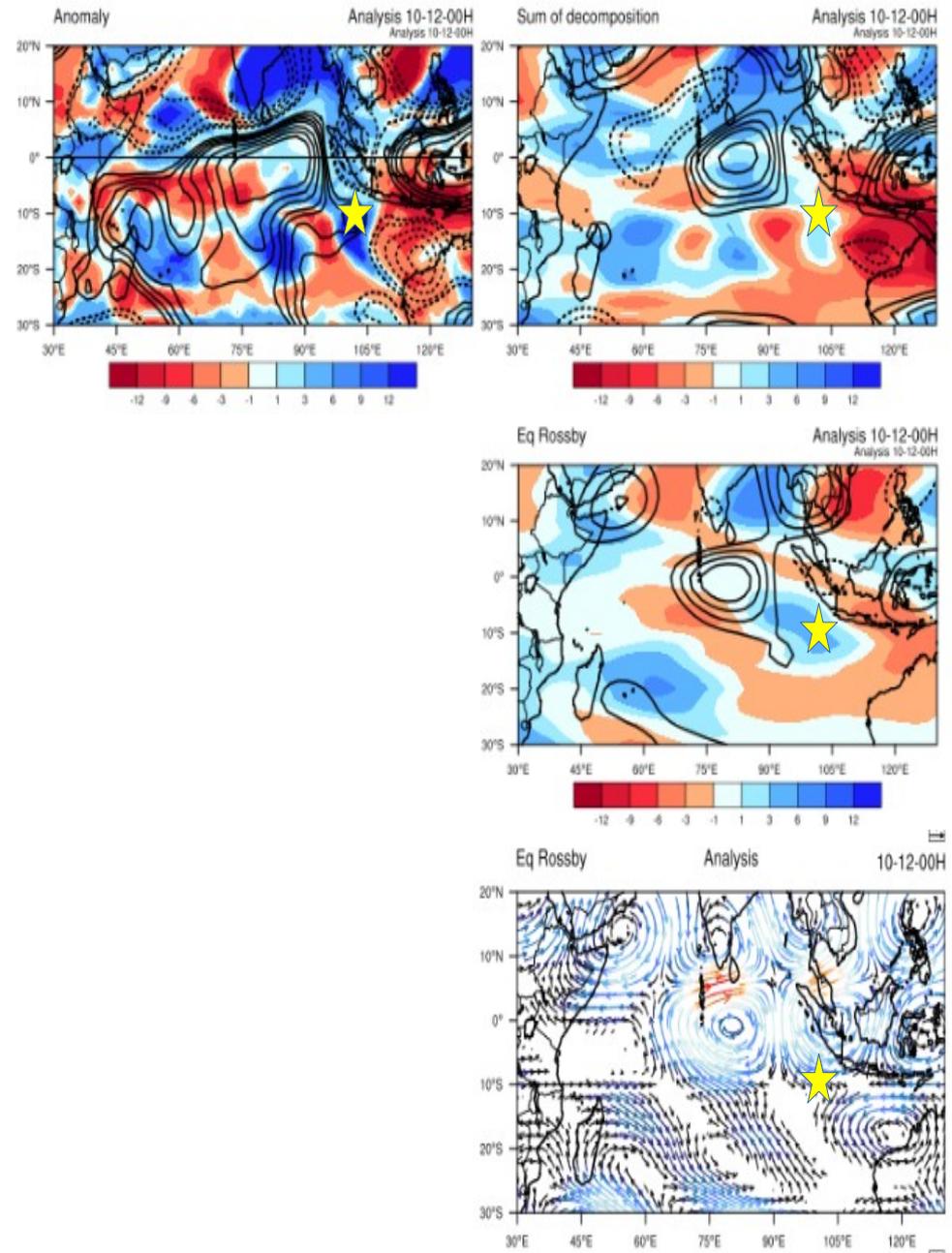


# Retour sur l'origine de la genèse des 2 derniers précurseurs

## Précurseur du 10 décembre

- Structure atypique de l'ER avec gyres centrés sur l'équateur
- Sur l'Est de l'Indien, ce mode semble expliquer alors une bonne partie des anomalies totales de la circulation à 850 hPa
- Initiation sur la façade Sud-Ouest d'un gyre anticyclonique en bordure des anomalies de Nord à Nord-Ouest
- Modulation en PW

## Ano SF 850 hPa + PW (couleurs)

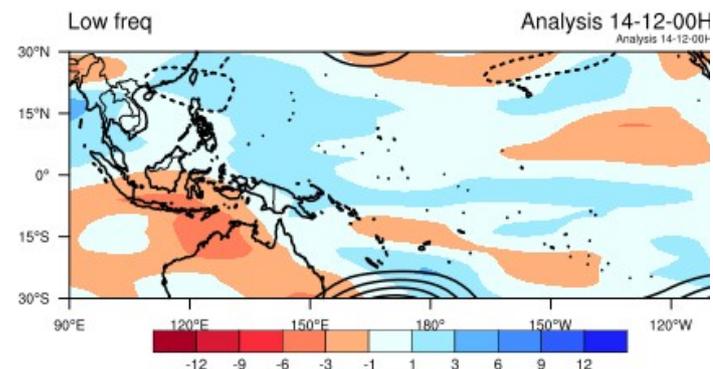
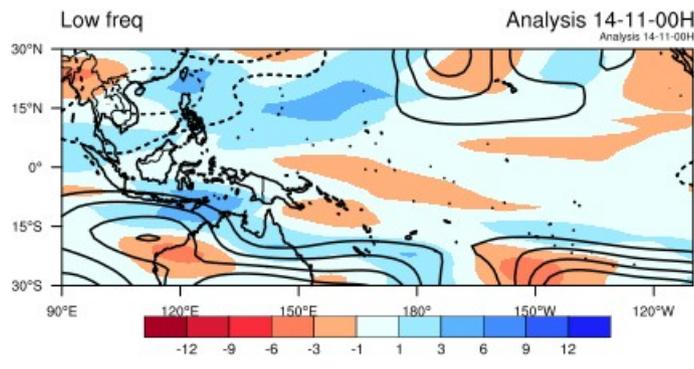
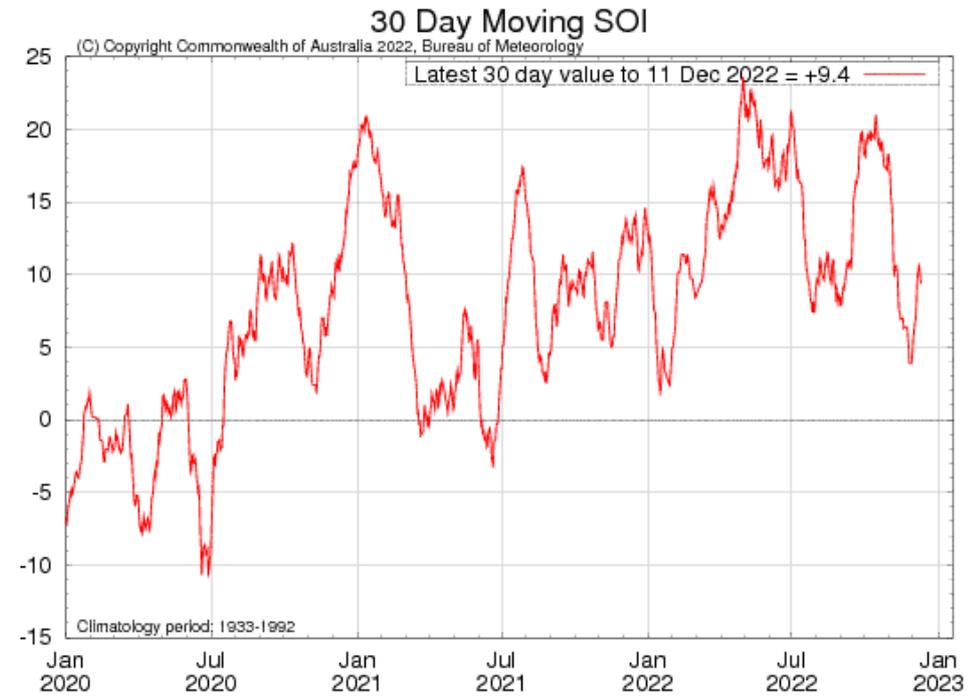
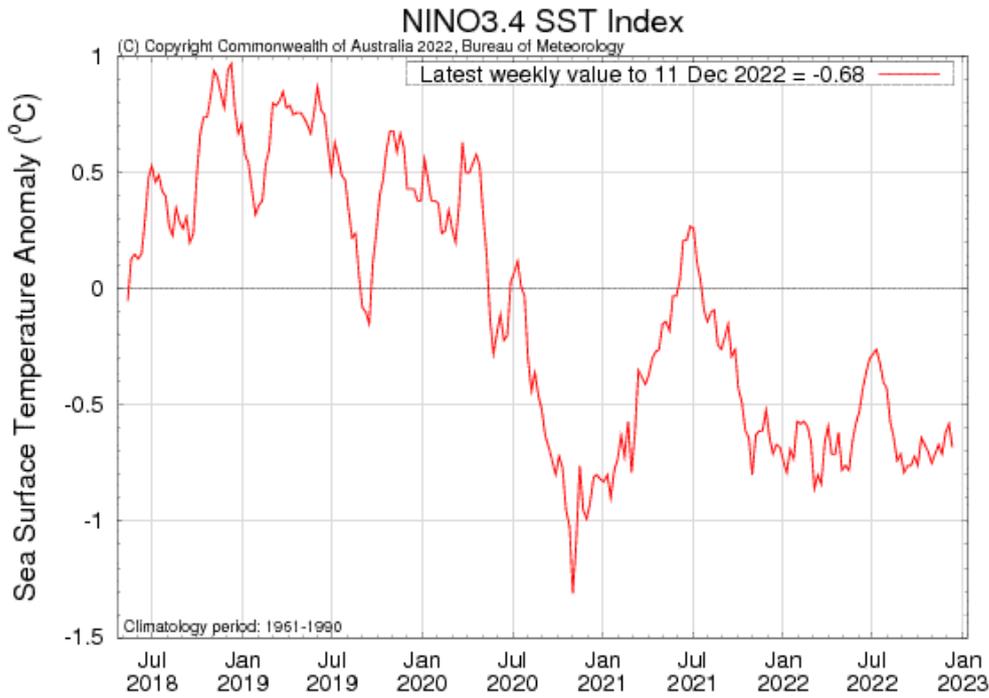


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# 1. Prévision - Basse fréquence

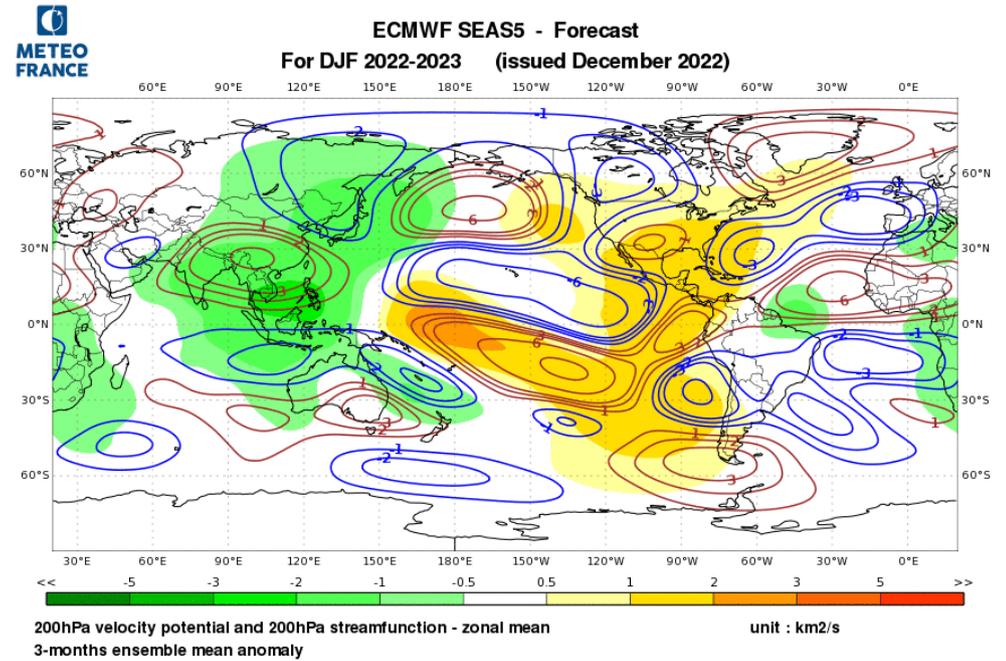
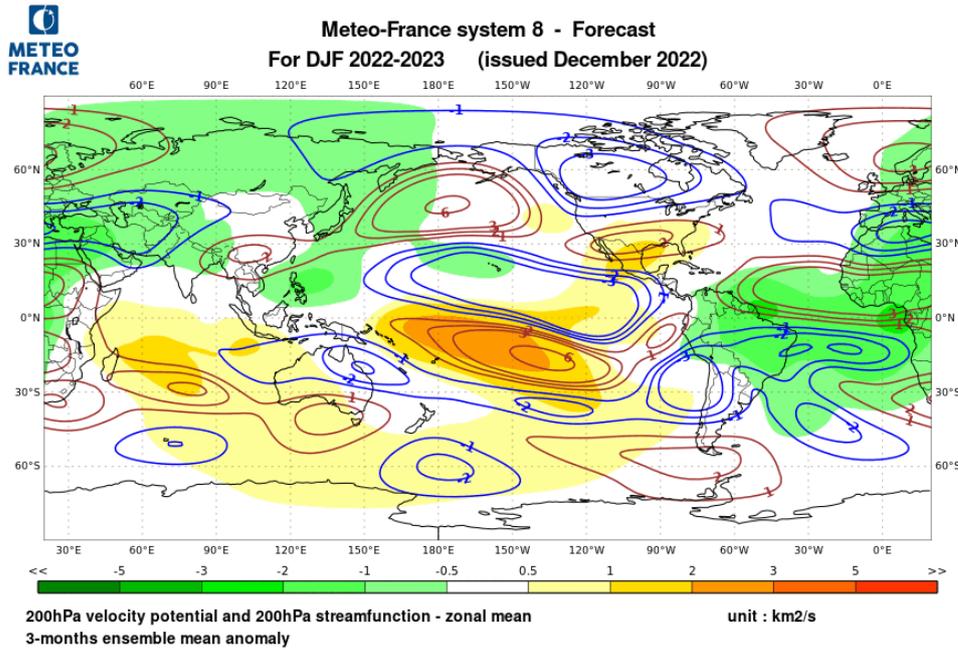
# Signal Basse Fréquence

## Contexte ENSO

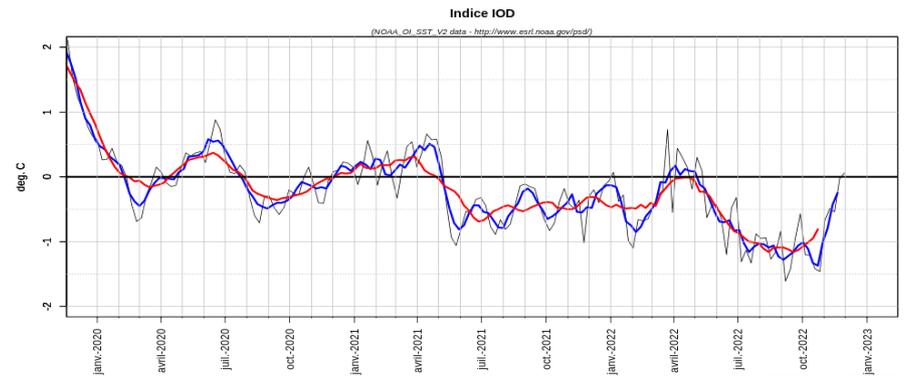
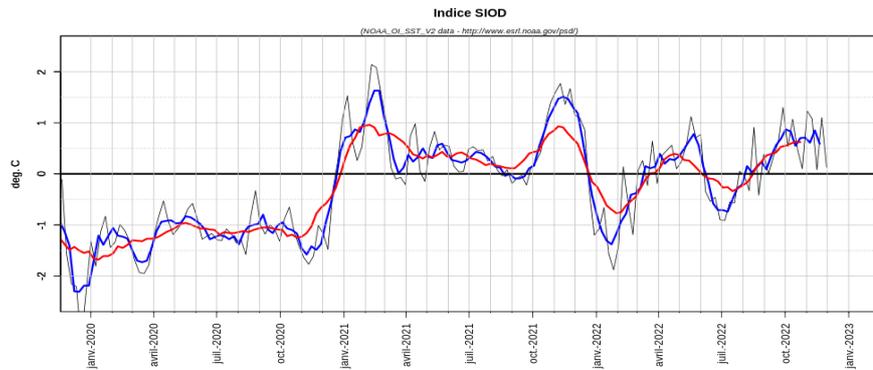
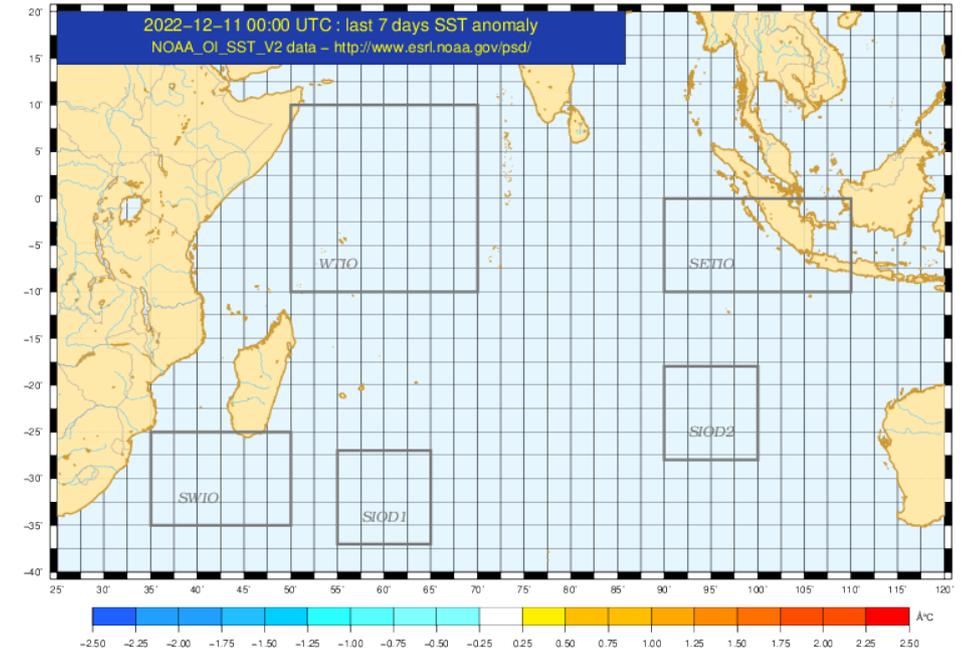
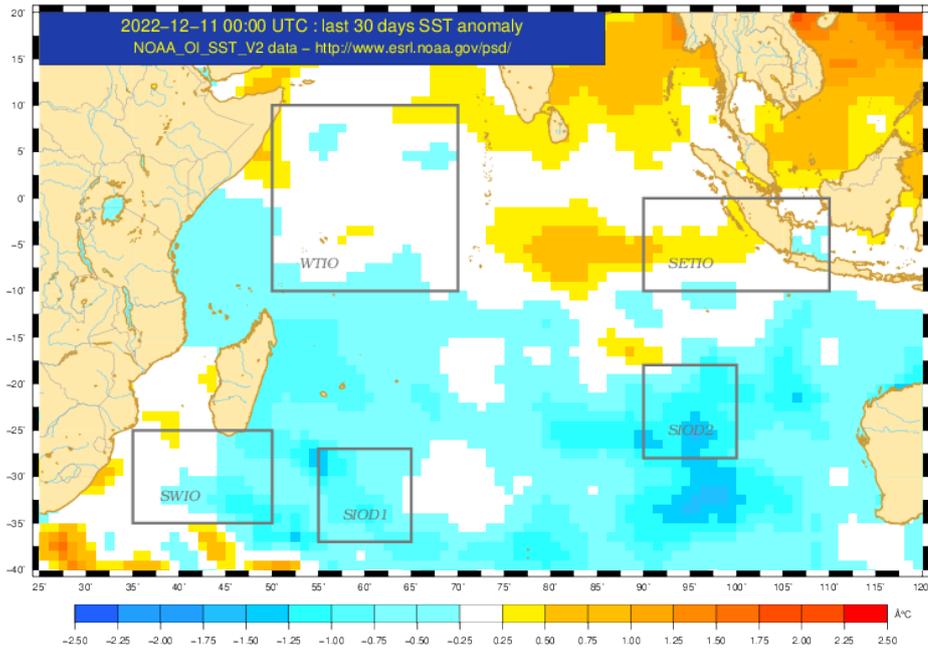


# Signal Basse Fréquence

## VP 200 prévu



# Signal Basse Fréquence - Zoom sur l'OI

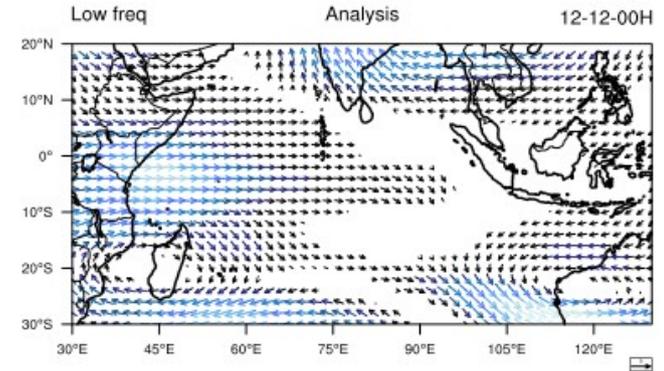
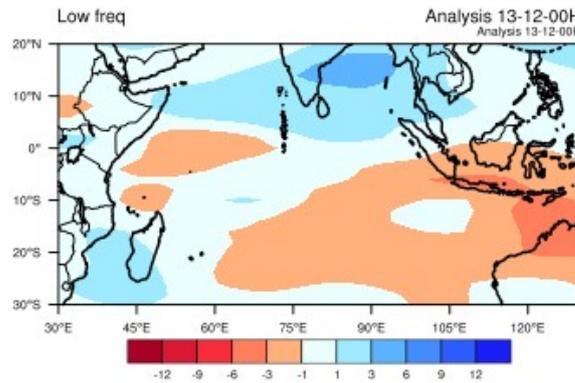
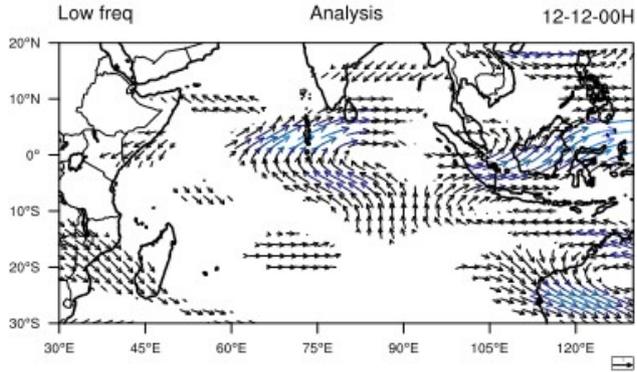


# Signal Basse Fréquence - Zoom sur l'OI

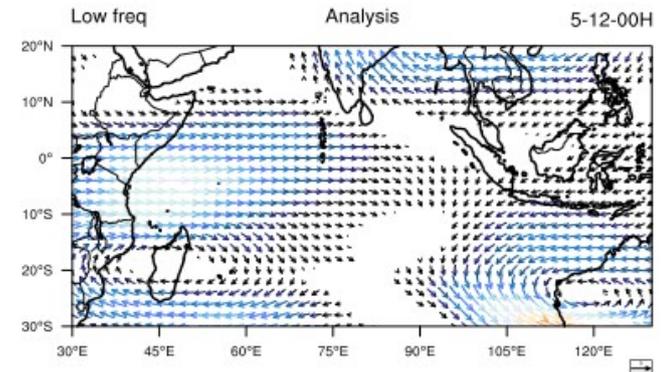
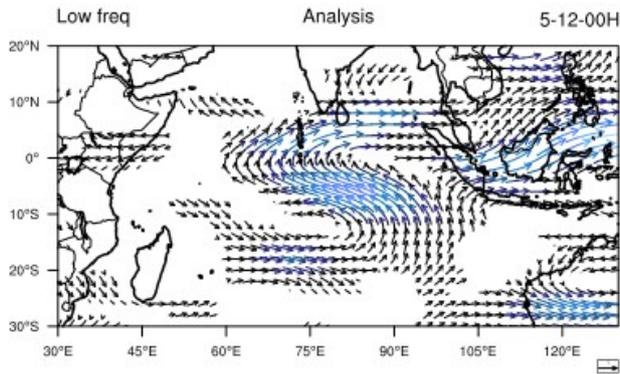
**U 850**

**U 200**

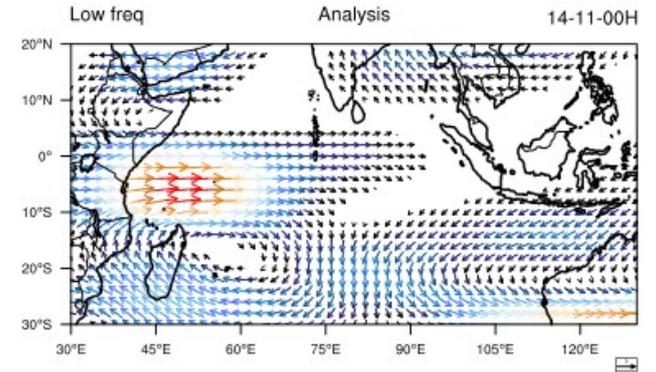
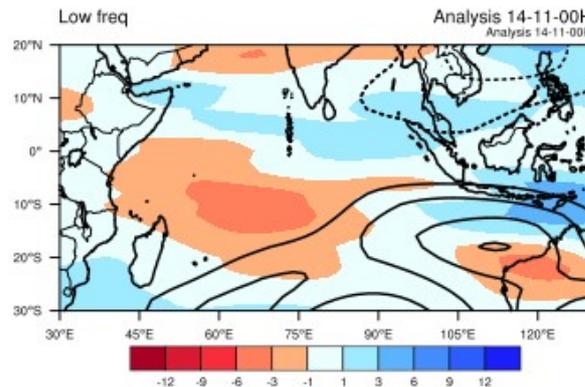
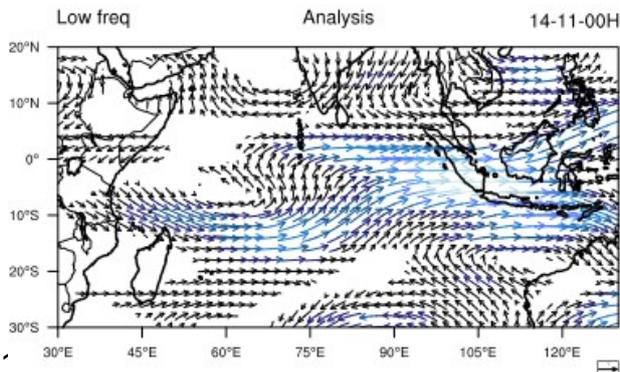
**J0**



**J-8**

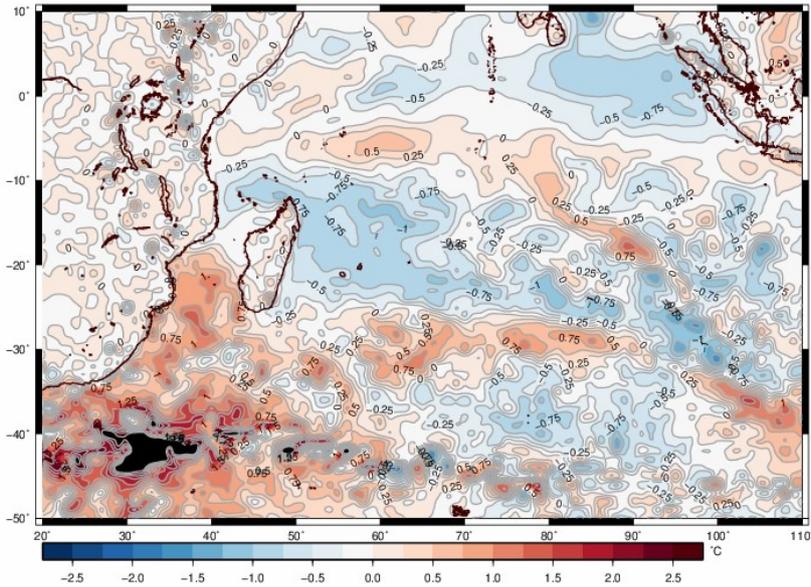


**J-29**

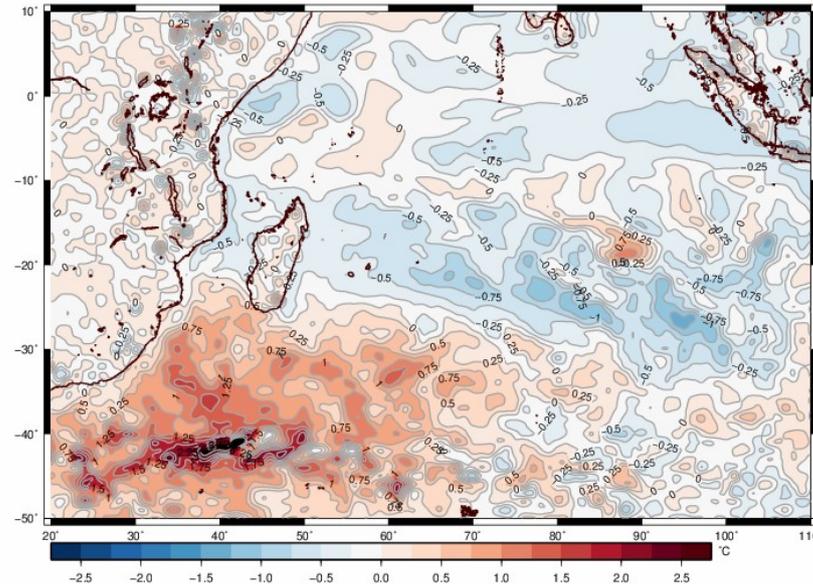


# Signal Basse Fréquence – Prévision SST OI

**Anomalie de température de surface océanique**  
période du 2022-12-12 au 2022-12-19  
Prévision mensuelle CEPMMT base 2022-12-12

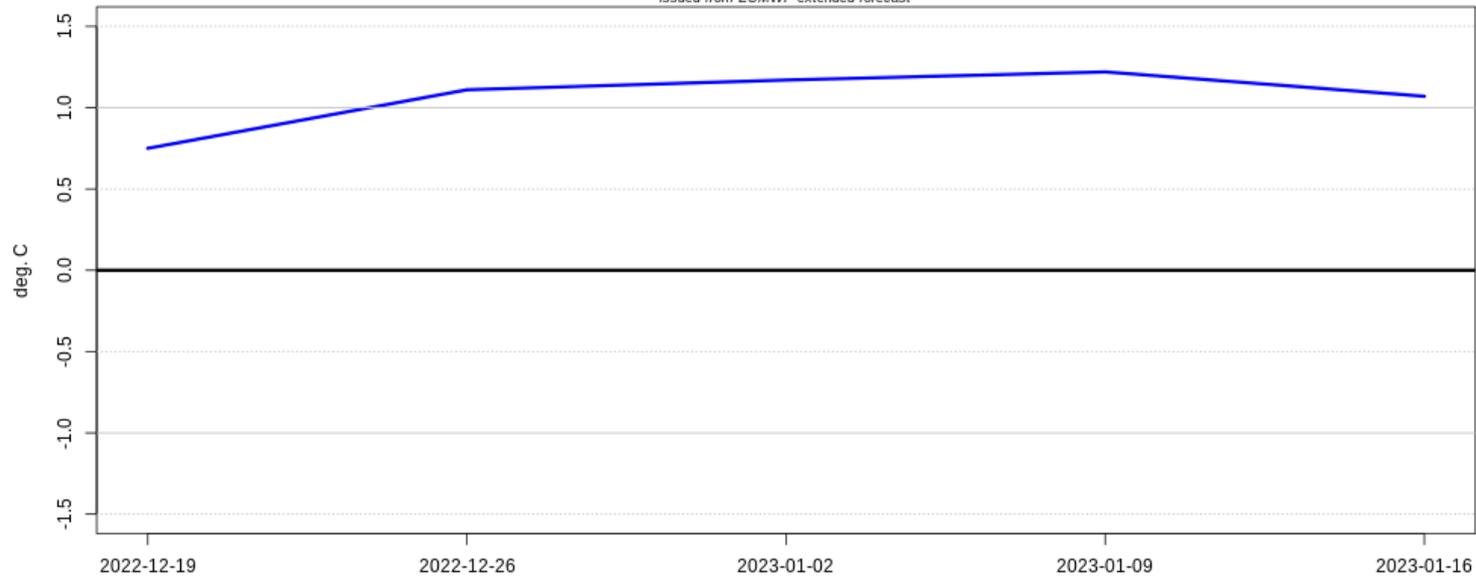


**Anomalie de température de surface océanique**  
période du 2023-01-02 au 2023-01-09  
Prévision mensuelle CEPMMT base 2022-12-12



**Indice SIOD**

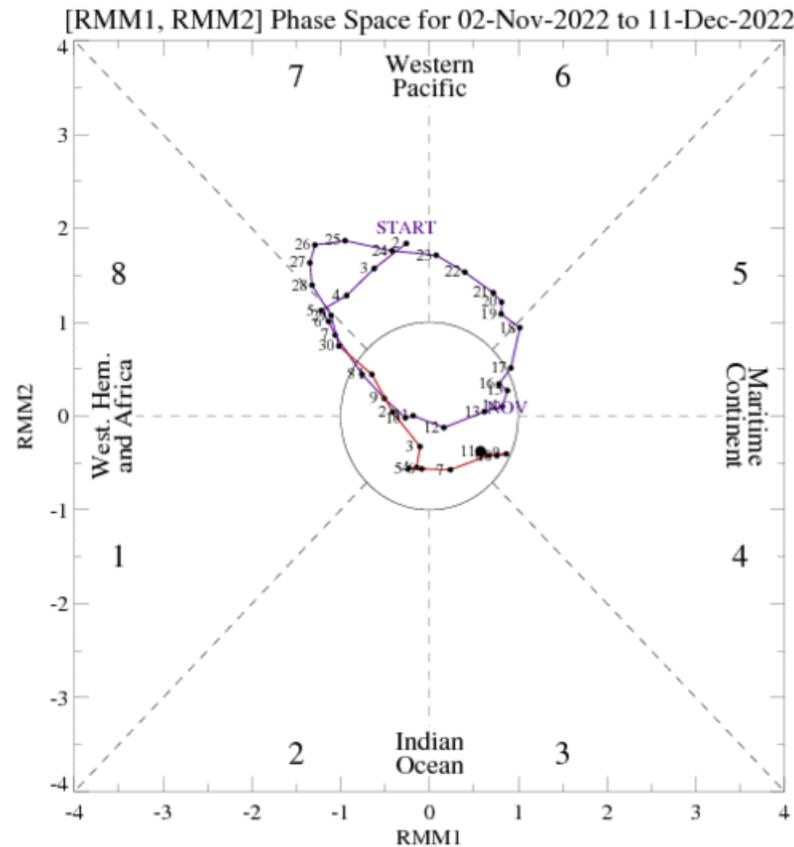
*issued from ECMWF extended forecast*



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## 2. Prévision - MJO

# 2. MJO observée, indice RMM

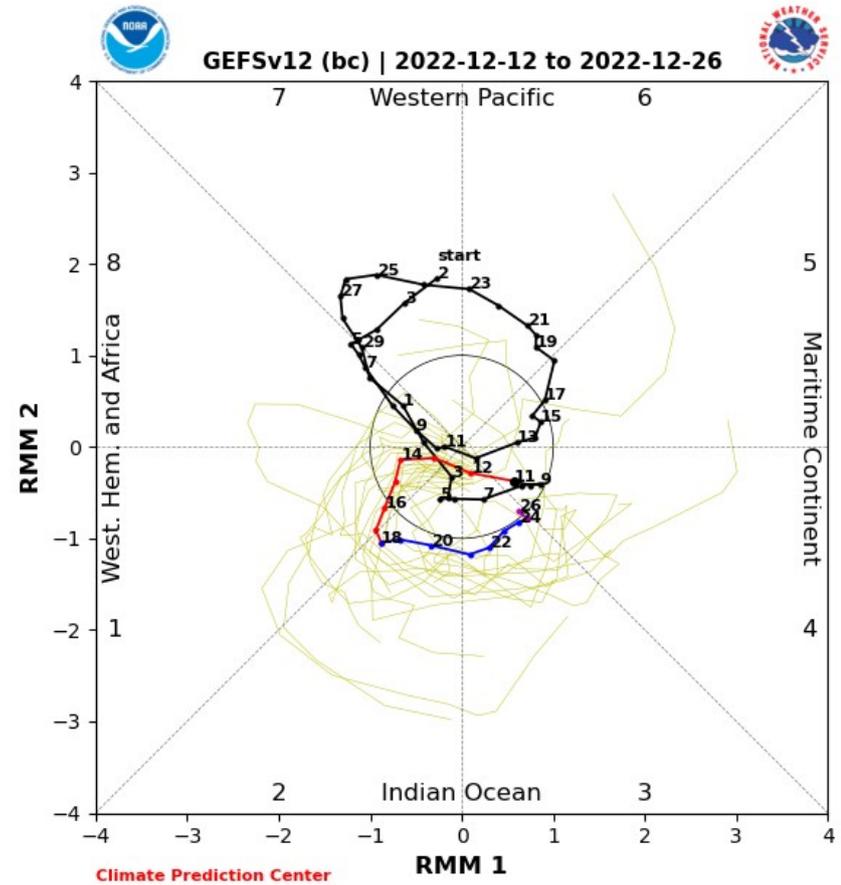
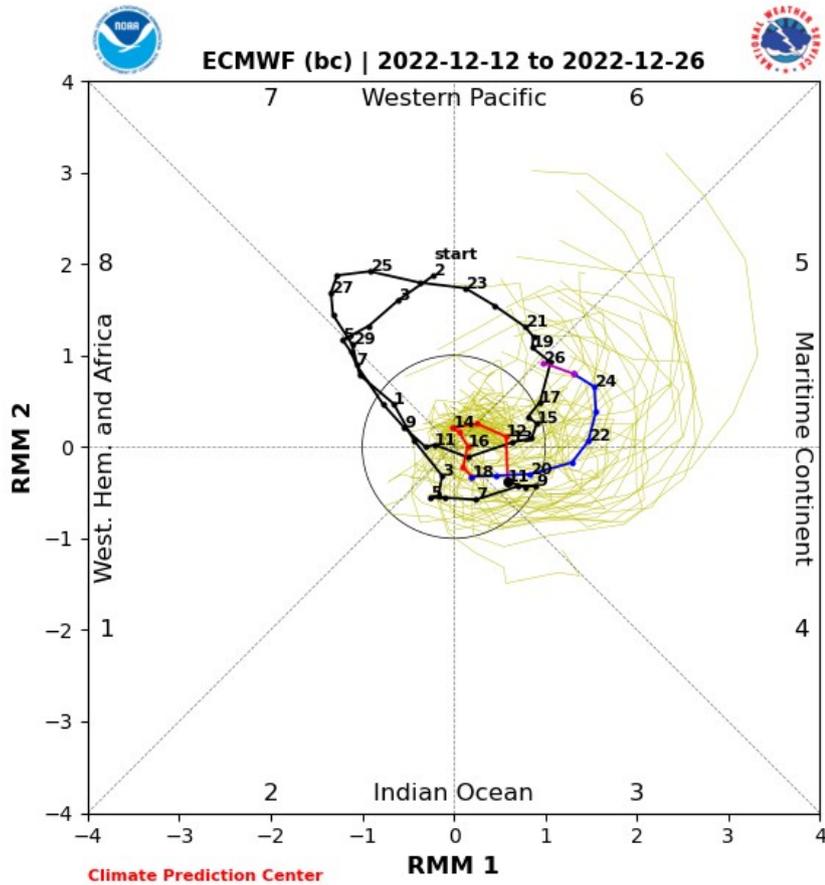


Retour sur les derniers briefings :

(\*) briefing du 28/10  
 (\*\*) briefing du 17/11

	31 oct. - 6 nov.	7 – 13 nov.	14 – 20 nov.	21 – 27 nov.	28 nov. - 4 déc.	5 – 11 déc.
<b>Phase MJO observée</b>	7/8	8/1/2/3/4	5/6	6/7	7/8/1	2/3/4
<b>Intensité</b>	Mod. à forte	Faible	Faible à mod.	Mod. à forte	Mod. À faible	Faible
<b>Phase MJO prévue</b>	?(*)	?(*)	5/6(**)	6/7(**)	?(**)	?(**)
<b>Intensité</b>			Mod. à forte	Modérée	Faible	Faible
<b>Confiance</b>			Bonne	Bonne	Faible	Faible

# MJO prévue indice RMM multi modèles

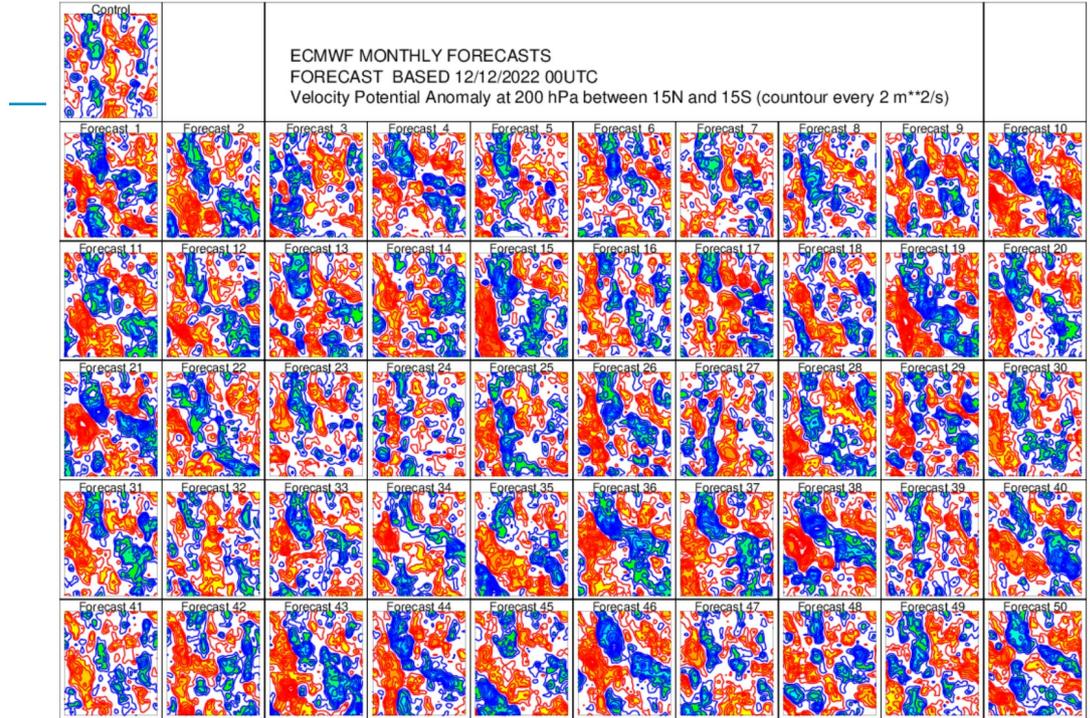
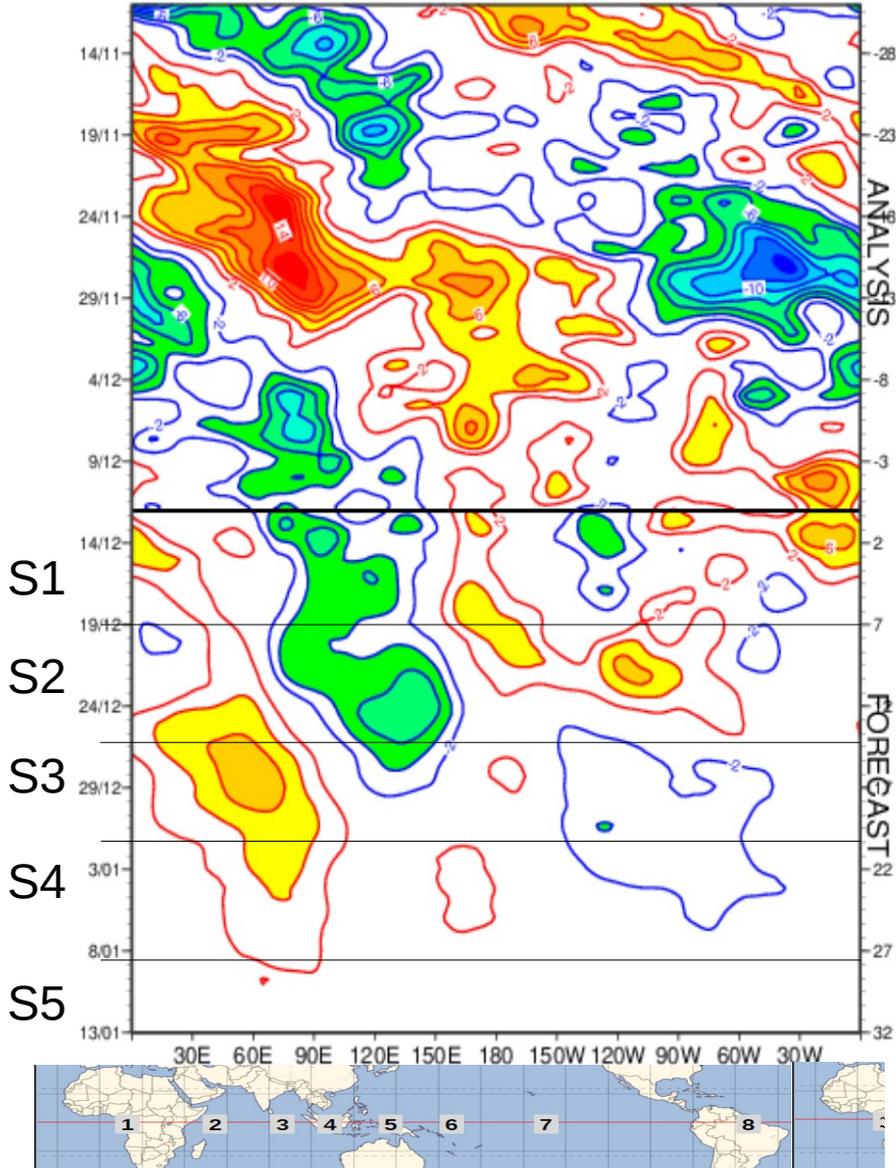


# VP200 – EPS mensuel

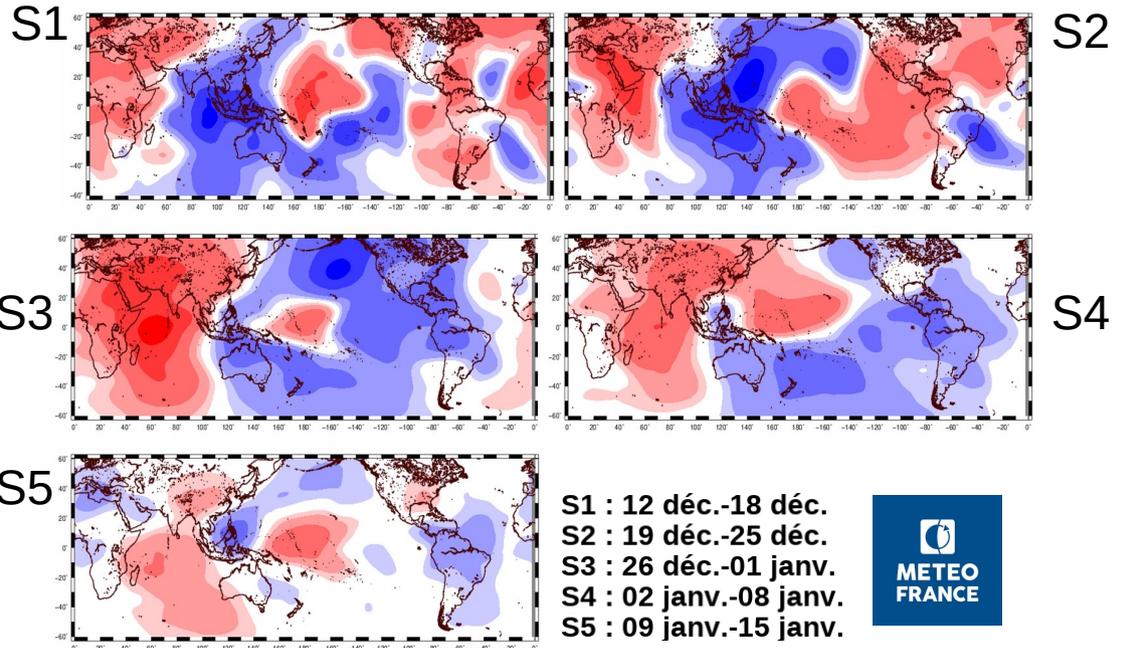
## Prévisions 51 membres

### Moyenne EPS

VELOCITY POTENTIAL AT 200 HPA  
Ensemble mean between Lat 15S and 15N  
FORECAST BASED 12/12/2022 00UTC



S1  
S2  
S3  
S4  
S5

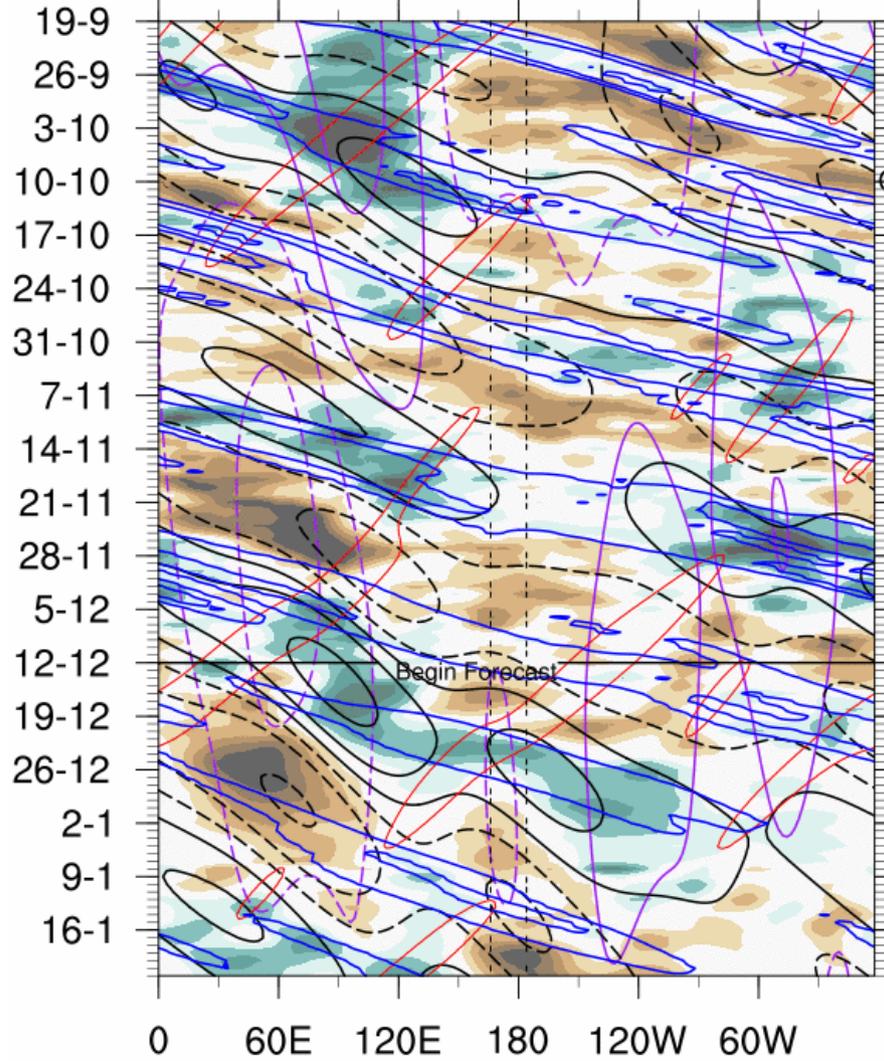


# VP200 – EPS mensuel

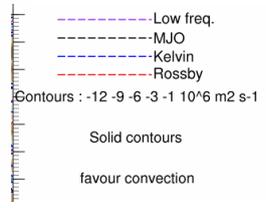
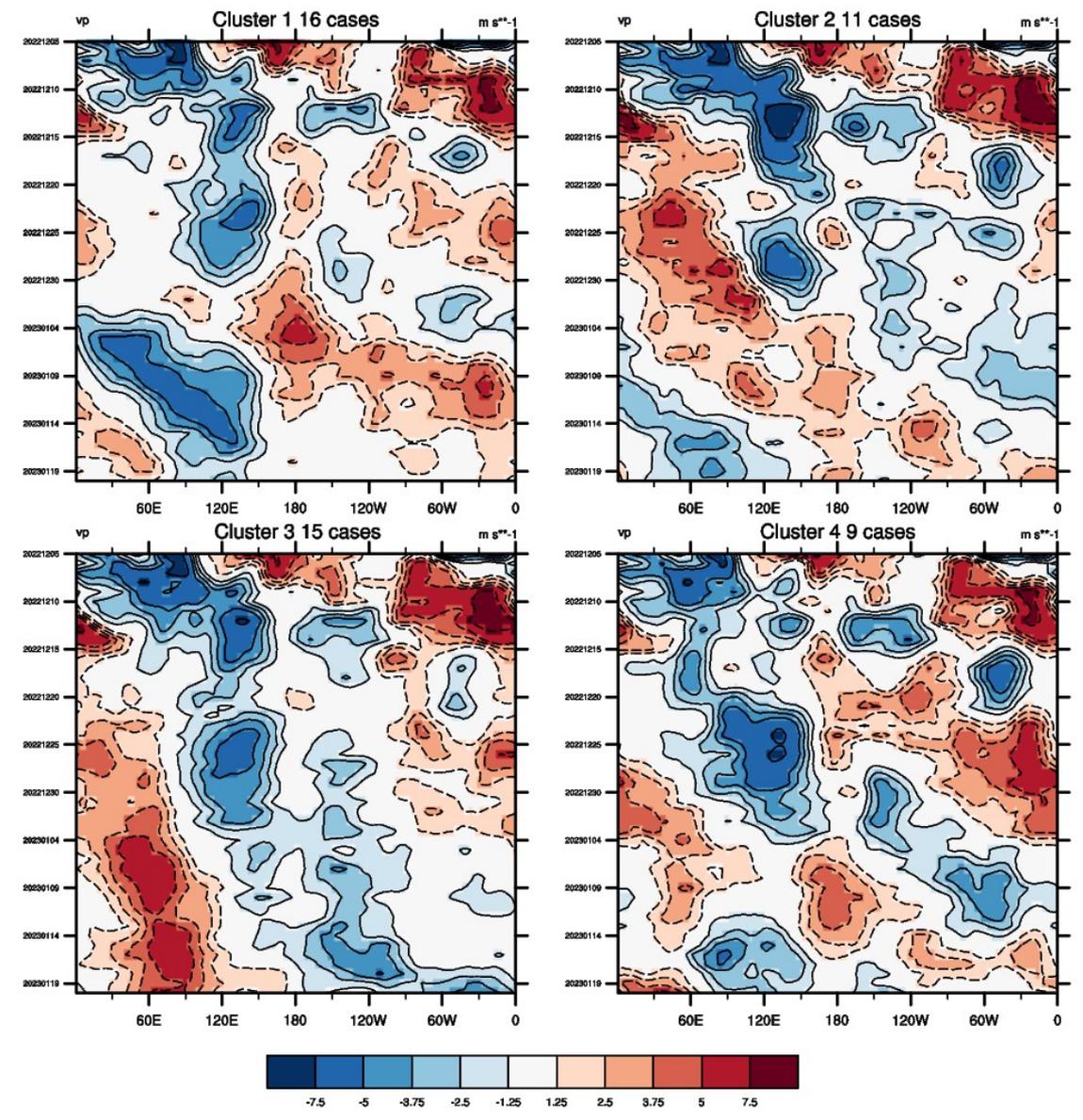
vp200 anomaly + Eq. Waves filtering

[15S-15N] AVG

Latest analysis: 20221212



Contact: philippe.peyrille@meteo.fr

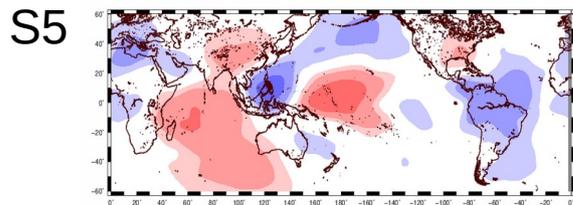
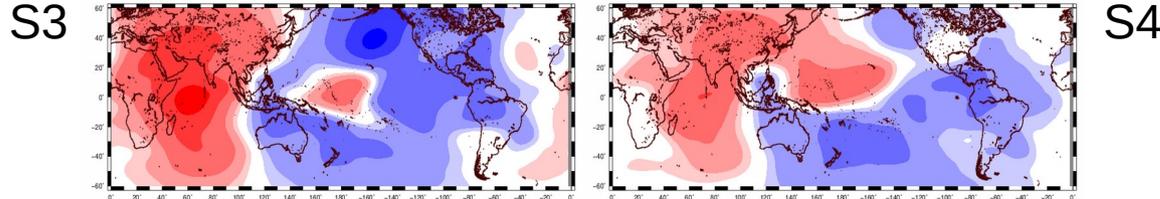
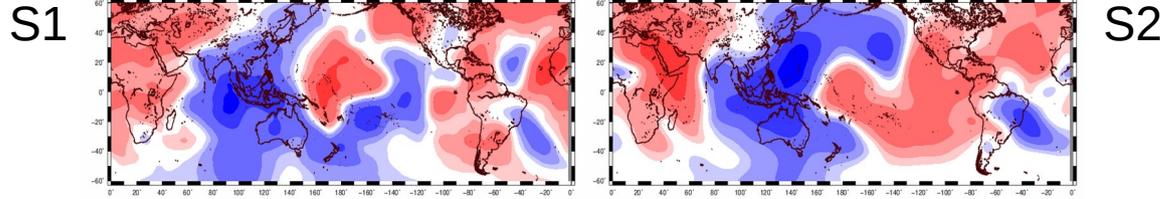
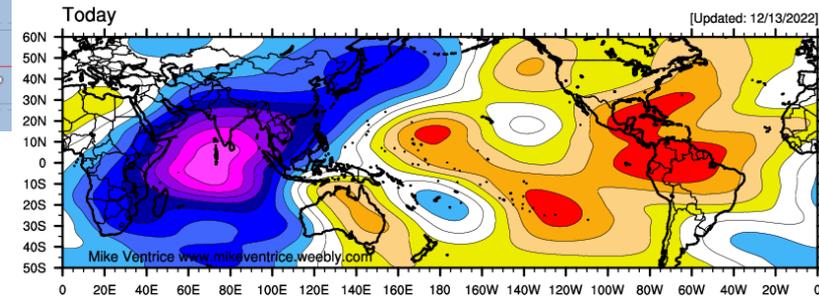


# Synthèse MJO

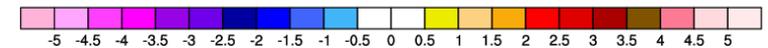
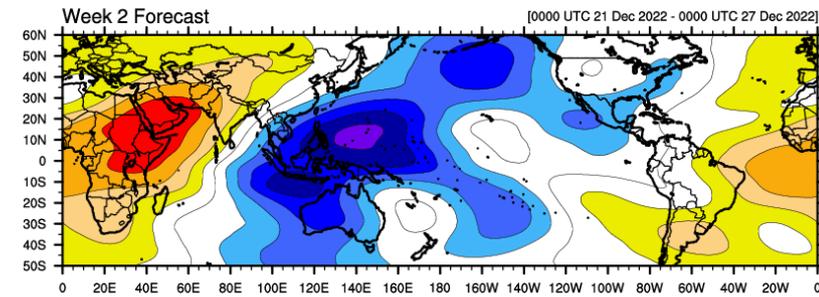
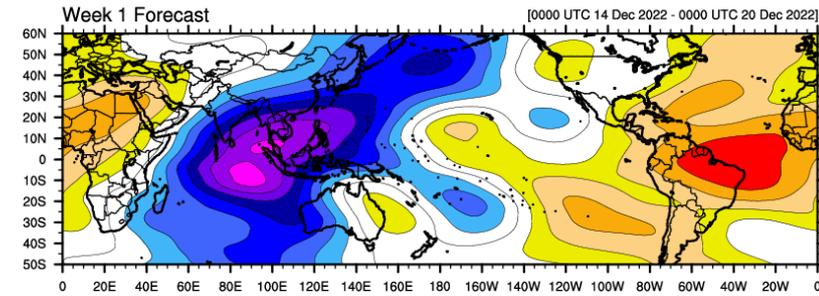
	S1	S2	S3	S4	S5
<b>Phase MJO prévue</b>	2/3	3/4	5/6/7	7/8/1	8/1/2
<b>Intensité</b>	Faible	Modérée	Faible à modérée	?	?
<b>Confiance</b>	Bonne	Bonne	Moyenne	Faible	Faible



MJO filtered VP200 Forecast



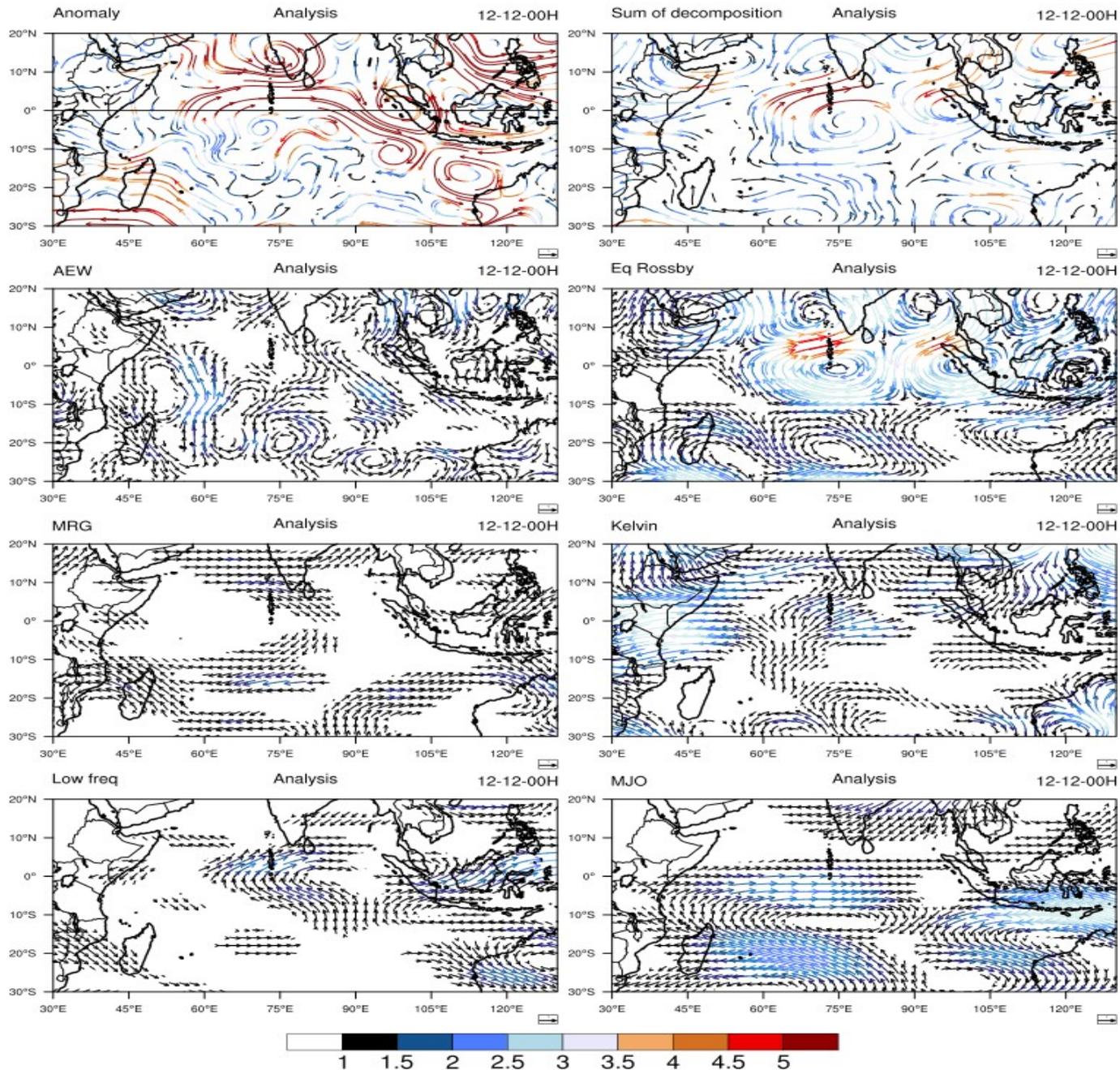
**S1 : 12 déc.-18 déc.**  
**S2 : 19 déc.-25 déc.**  
**S3 : 26 déc.-01 janv.**  
**S4 : 02 janv.-08 janv.**  
**S5 : 09 janv.-15 janv.**



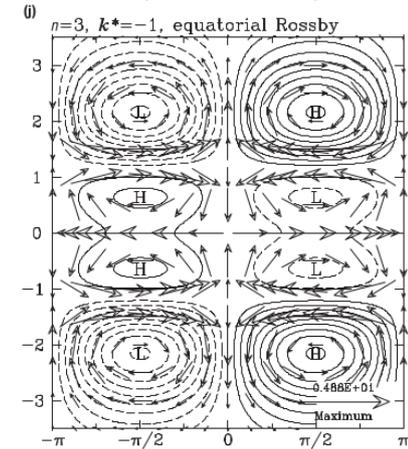
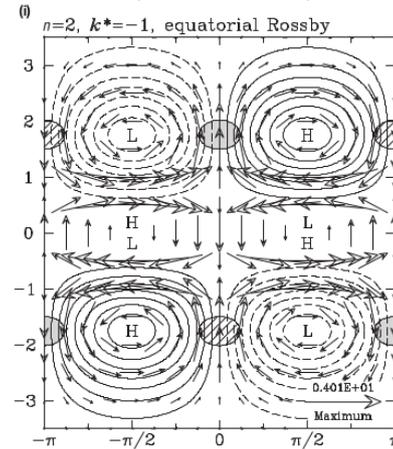
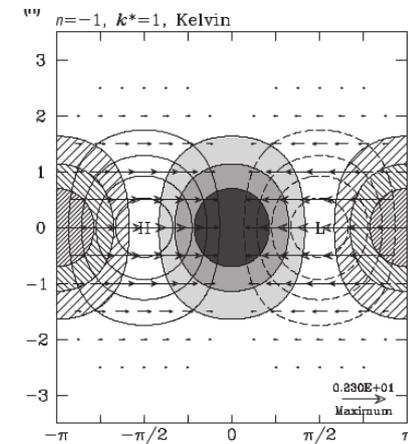
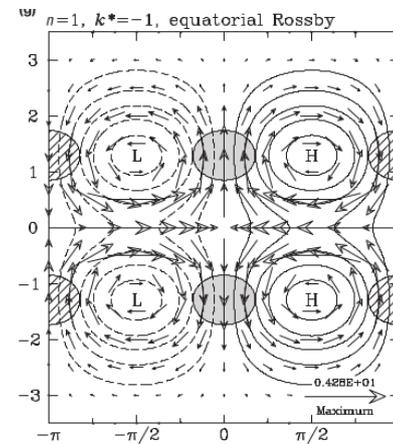
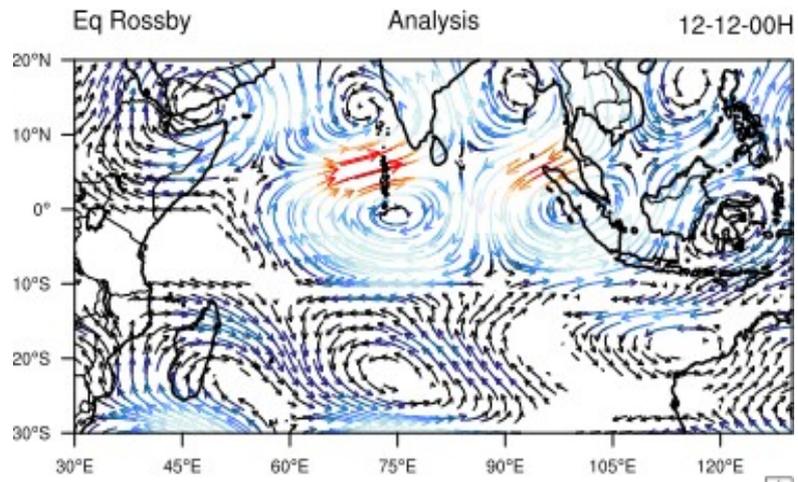
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## 3. Prévision – Ondes équatoriales

# 3. Ondes équatoriales

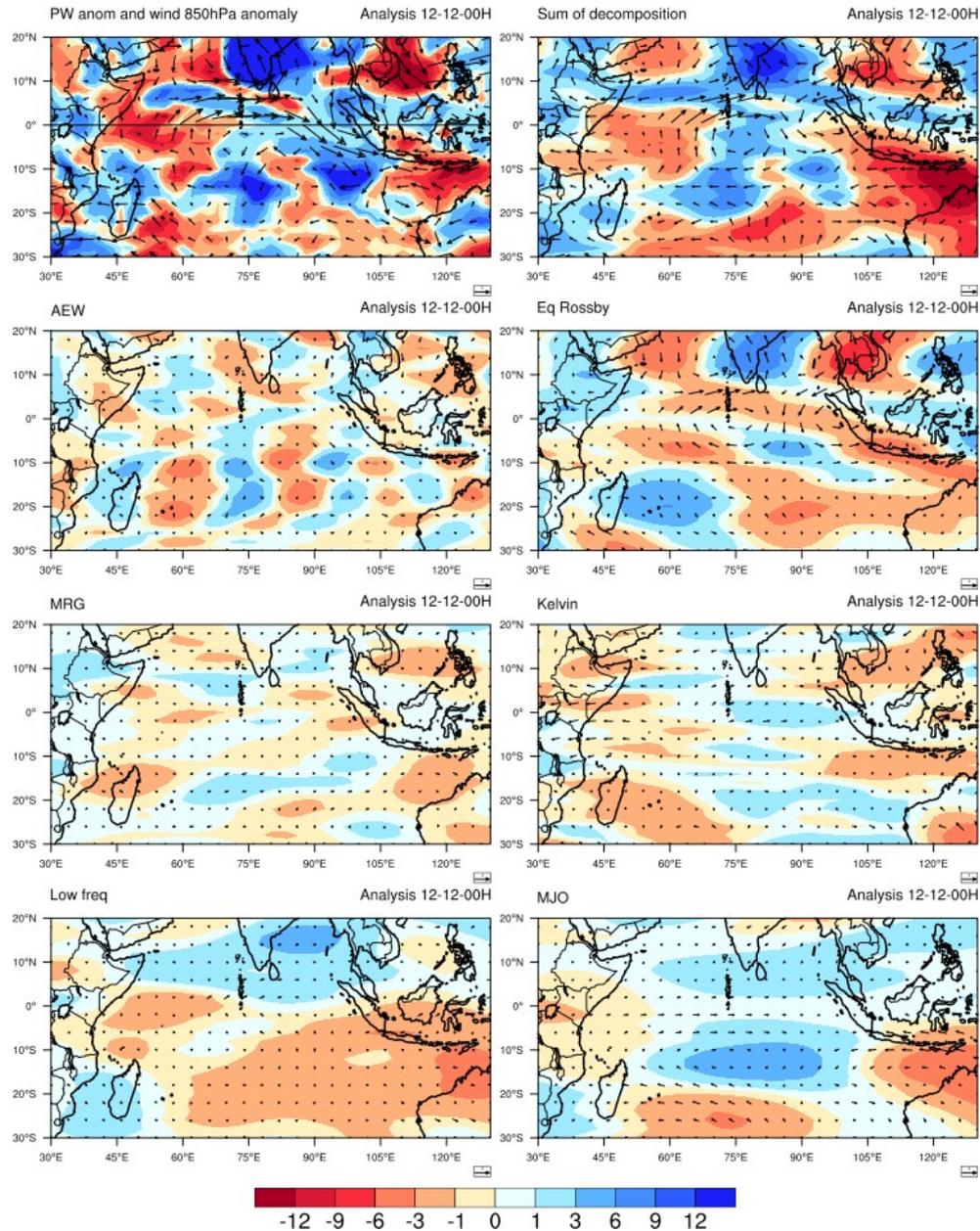


# 3. Ondes équatoriales



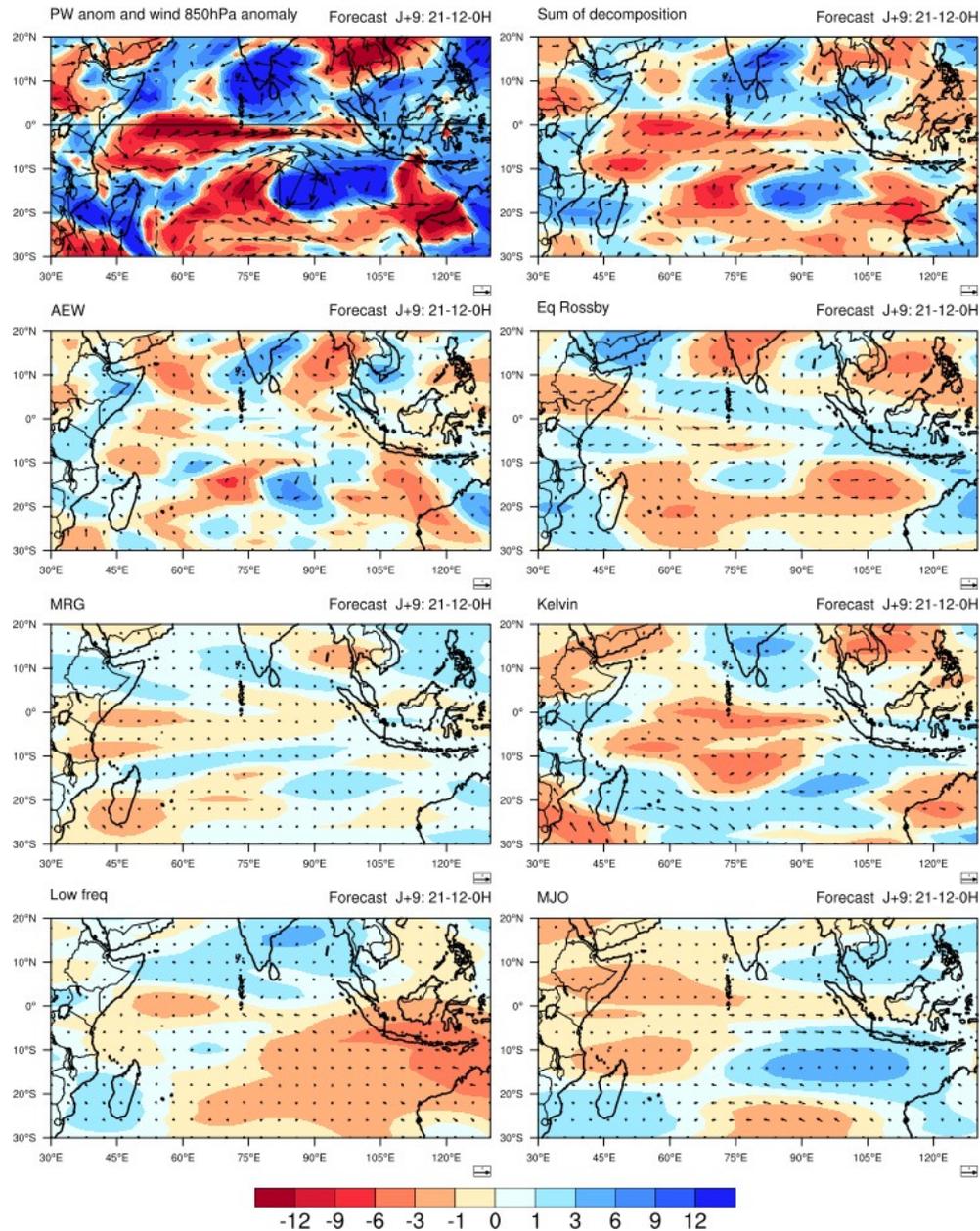
# 3. Ondes équatoriales

## PW and 850hPa wind anomalies



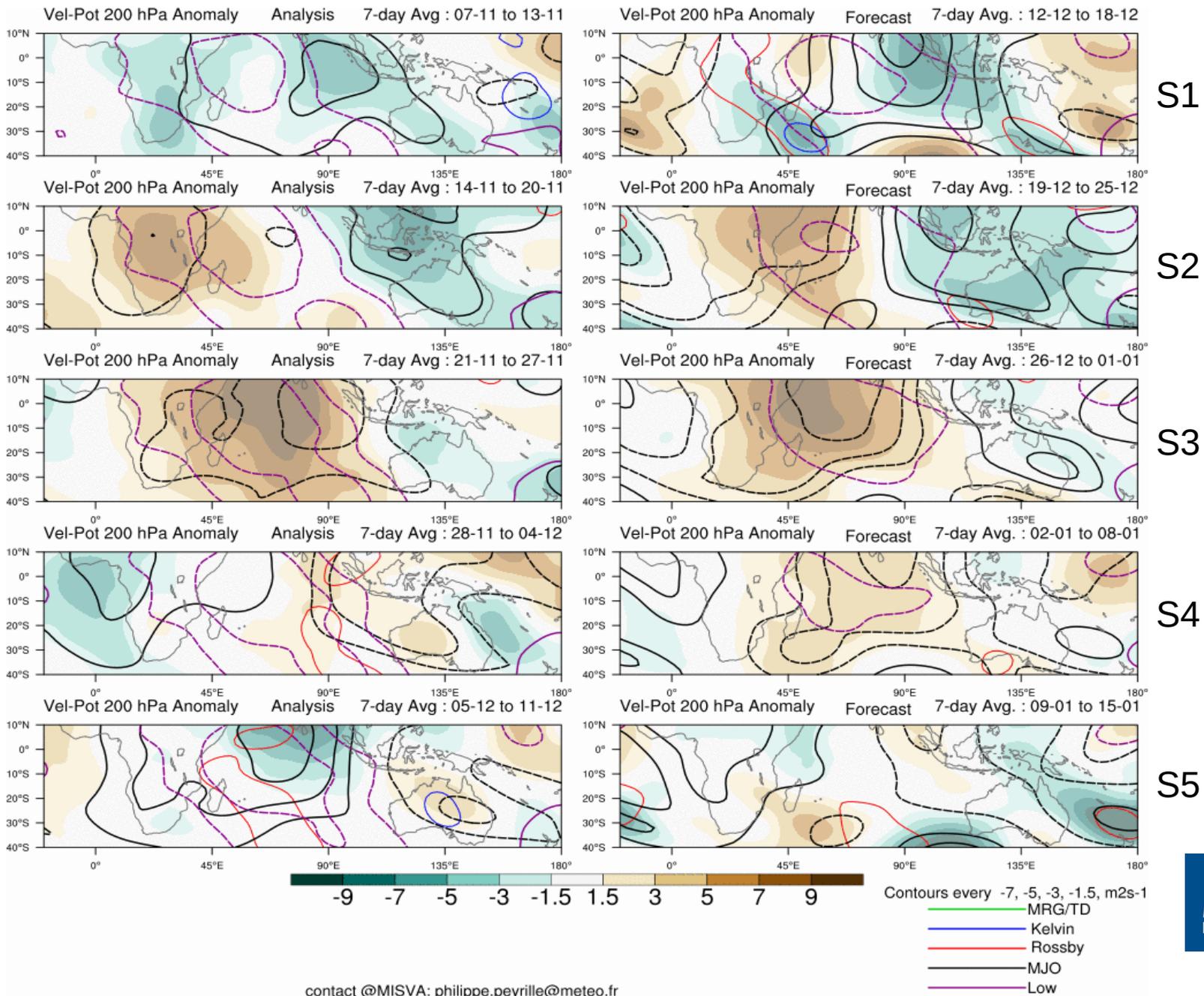
# 3. Ondes équatoriales

## PW and 850hPa wind anomalies



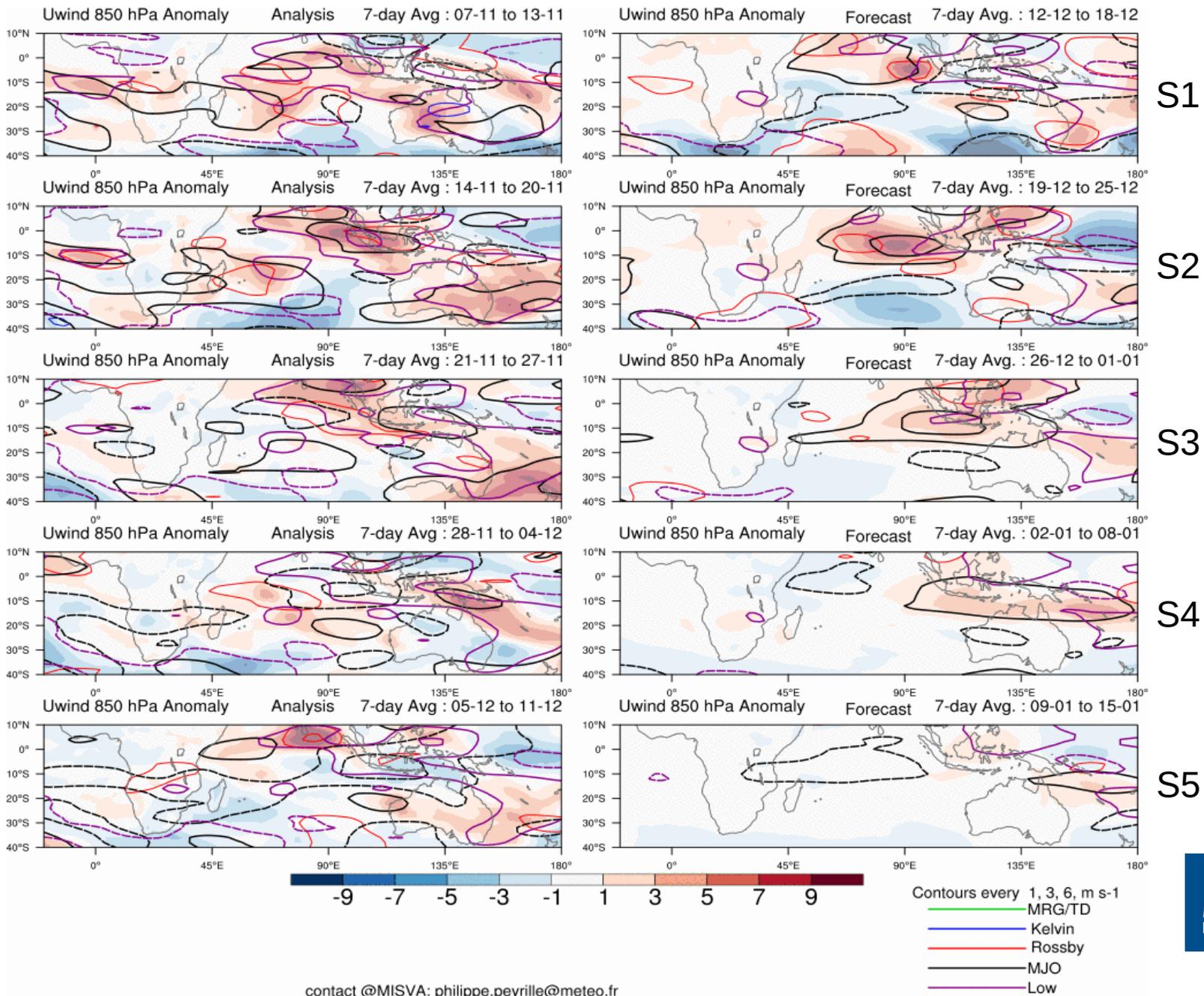
# VP200 – MJO, ER dans l'Indien

## Analyse



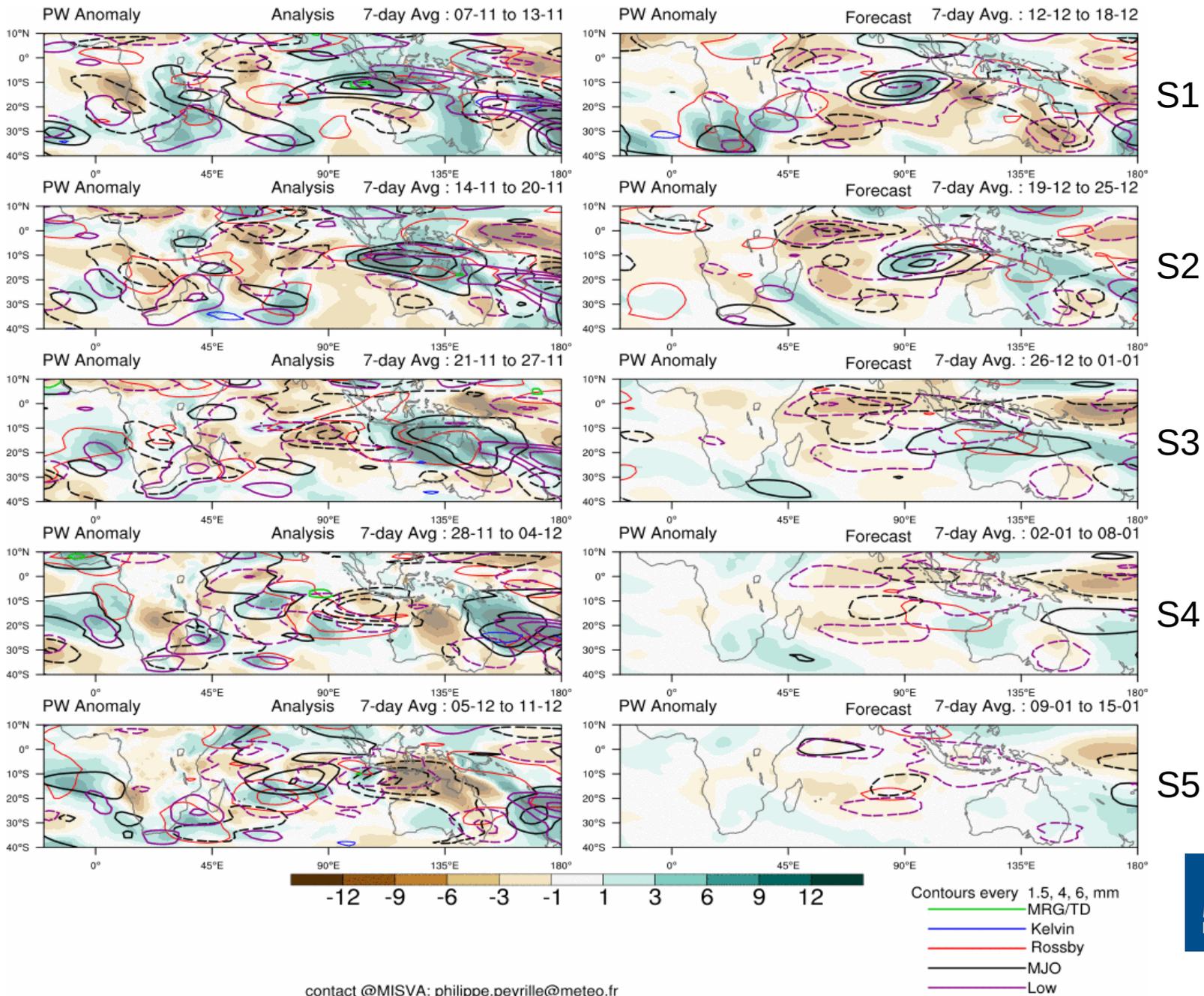
# U850 – MJO, ER dans l'Indien

## Analyse



# PW – MJO, ER dans l'Indien

## Analyse

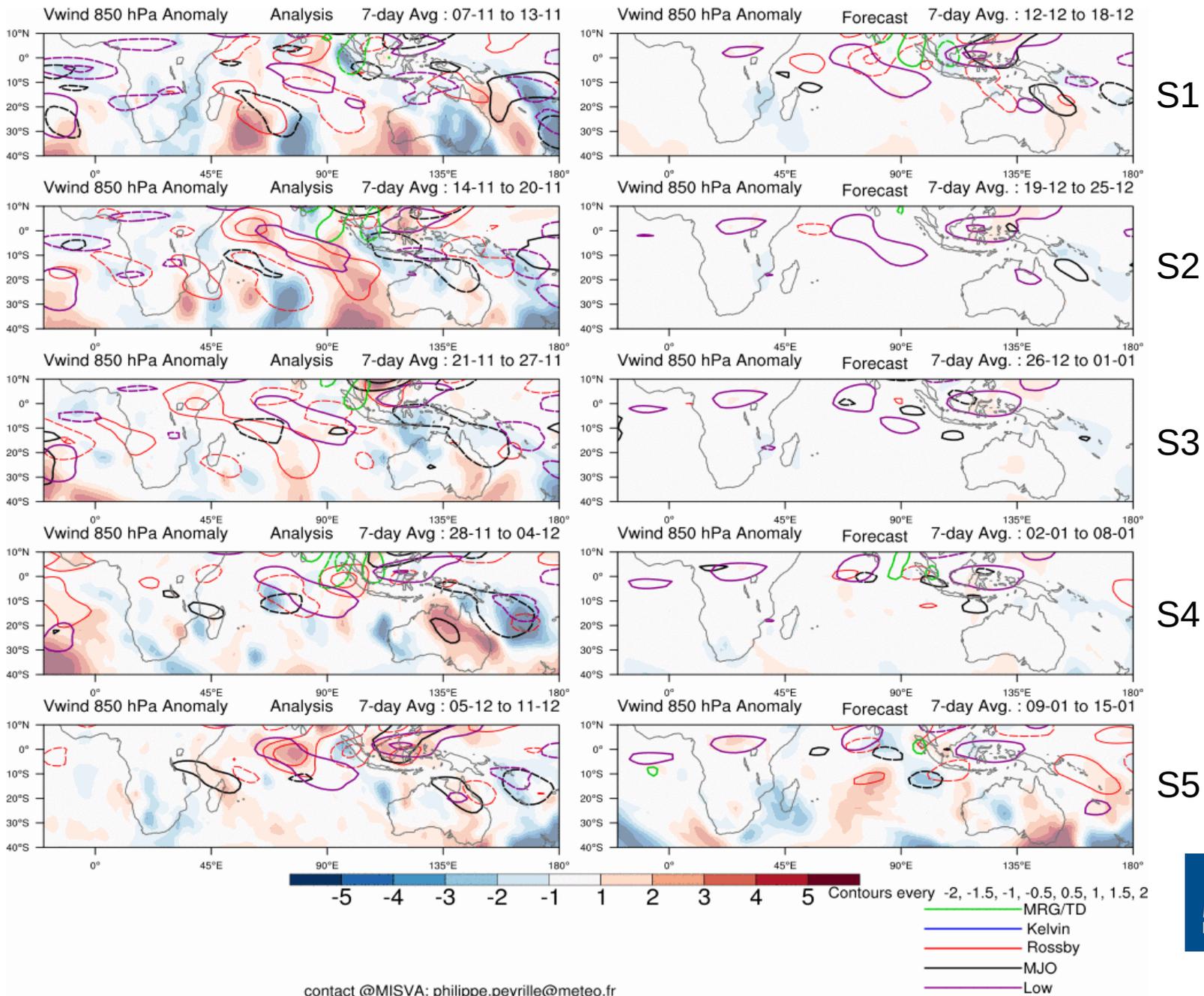


S1  
S2  
S3  
S4  
S5



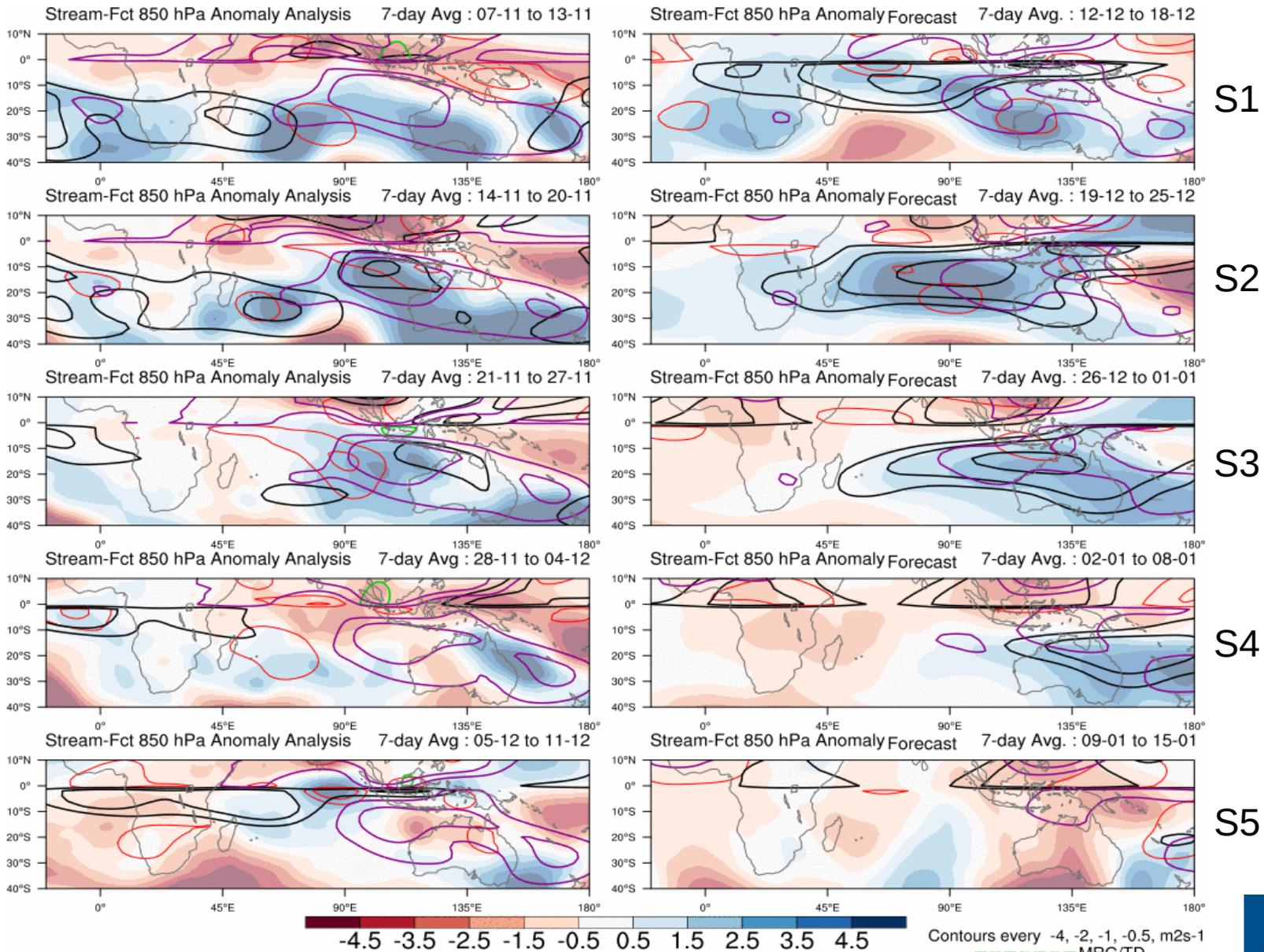
# V850 – MJO, ER dans l'Indien

## Analyse



# SF850 – MJO, ER dans l'Indien

## Analyse



S1

S2

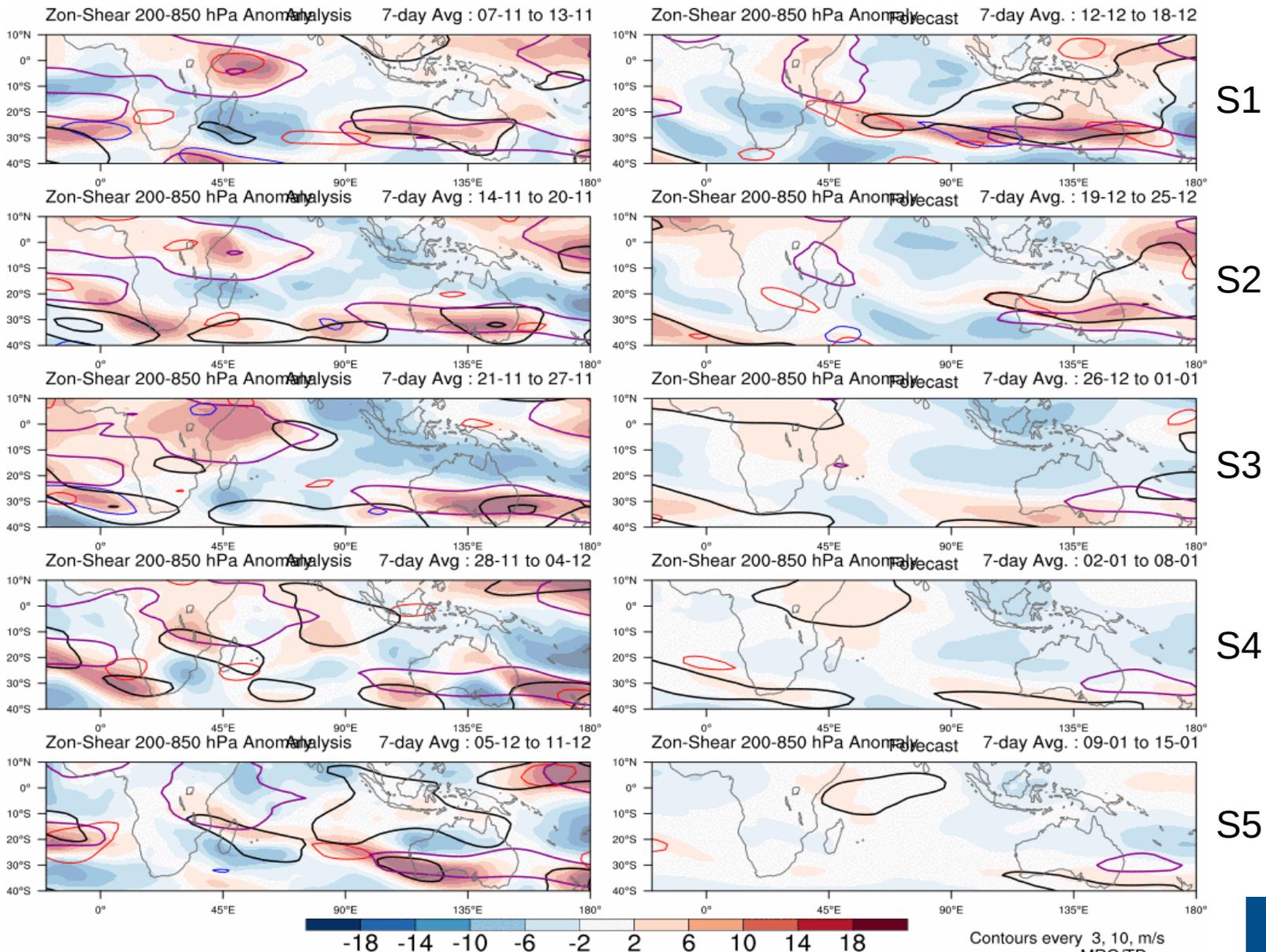
S3

S4

S5

# U<sub>shear</sub> – MJO, ER dans l'Indien

## Analyse



S1

S2

S3

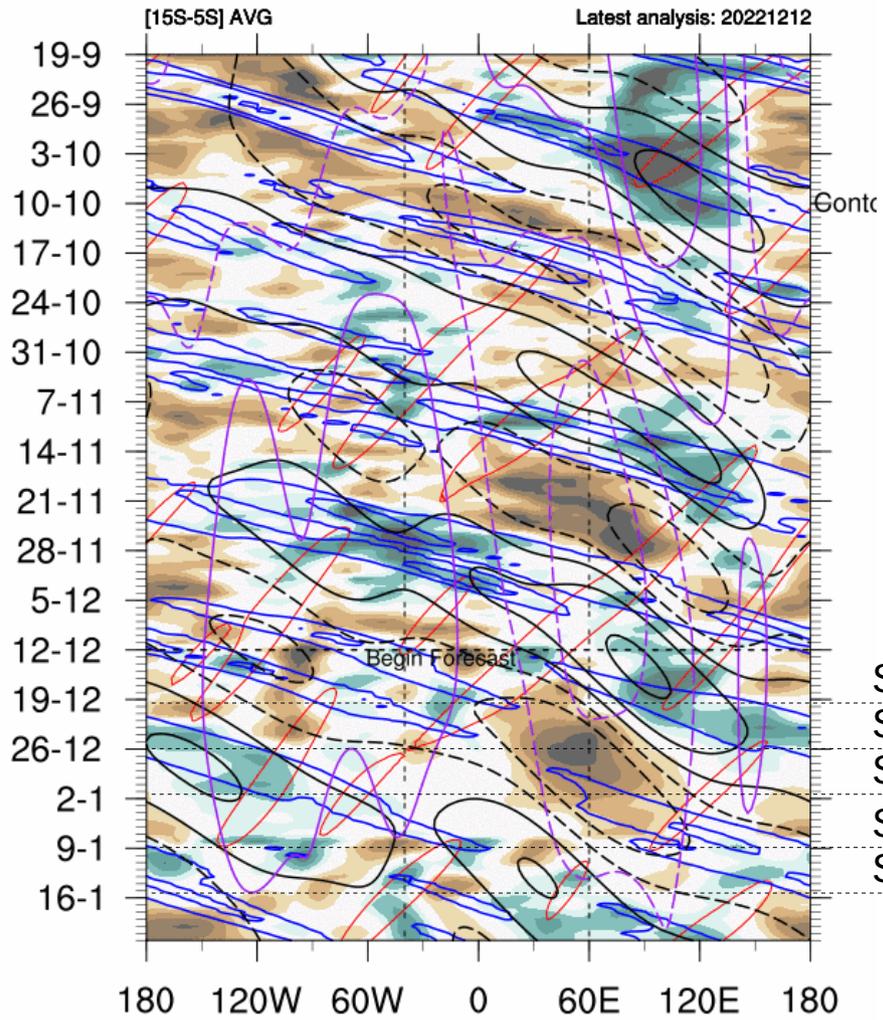
S4

S5



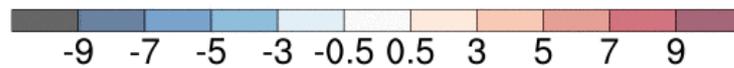
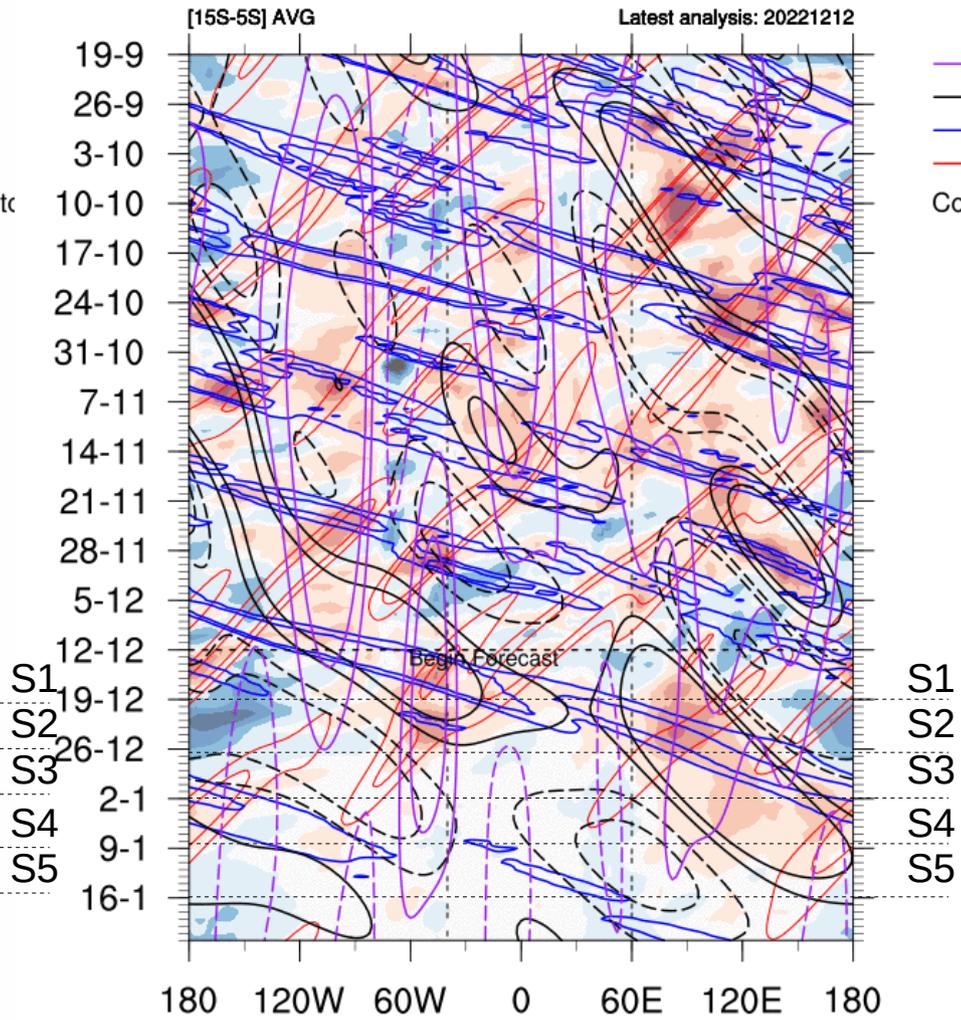
# 3. Ondes équatoriales

vp200 anomaly + Eq. Waves filtering



Contact: philippe.peyrille@meteo.fr

u850 anomaly + Eq. Waves filtering



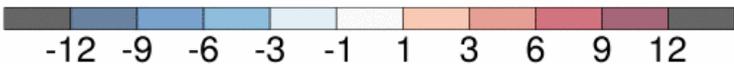
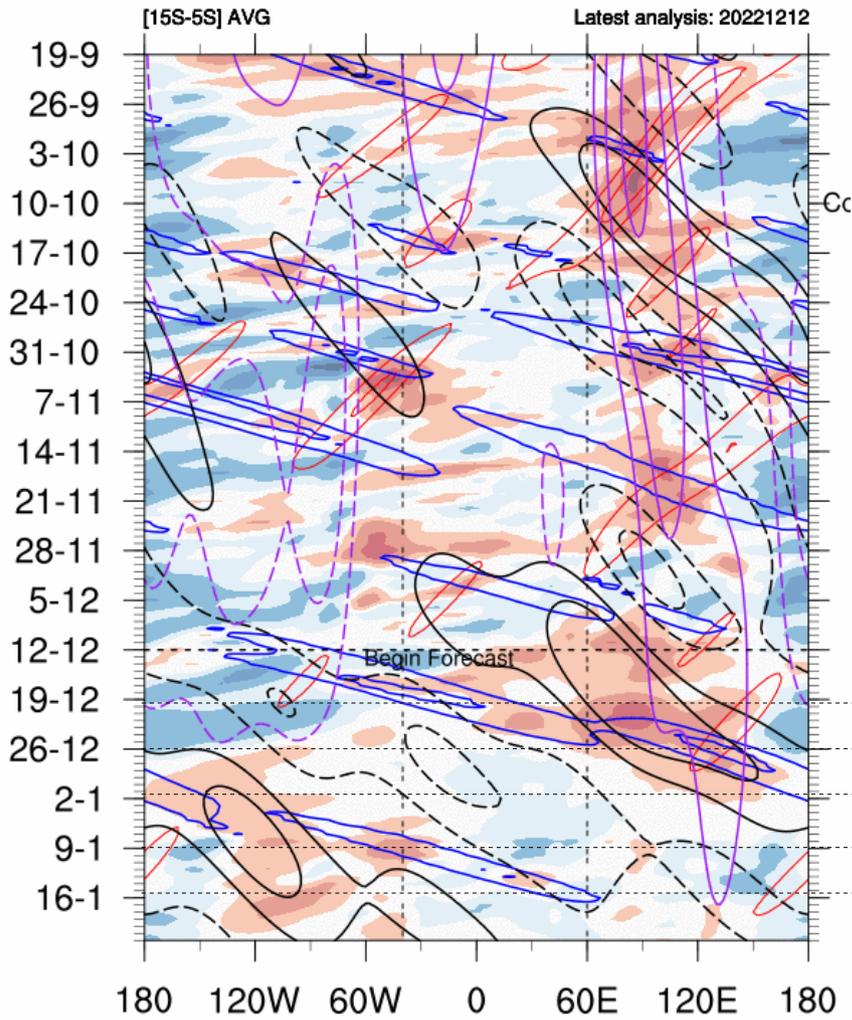
Contact: philippe.peyrille@meteo.fr

- Low freq.
  - MJO
  - Kelvin
  - Rossby
- Contours : 0.5 1 3 m s<sup>-1</sup>

S1  
S2  
S3  
S4  
S5

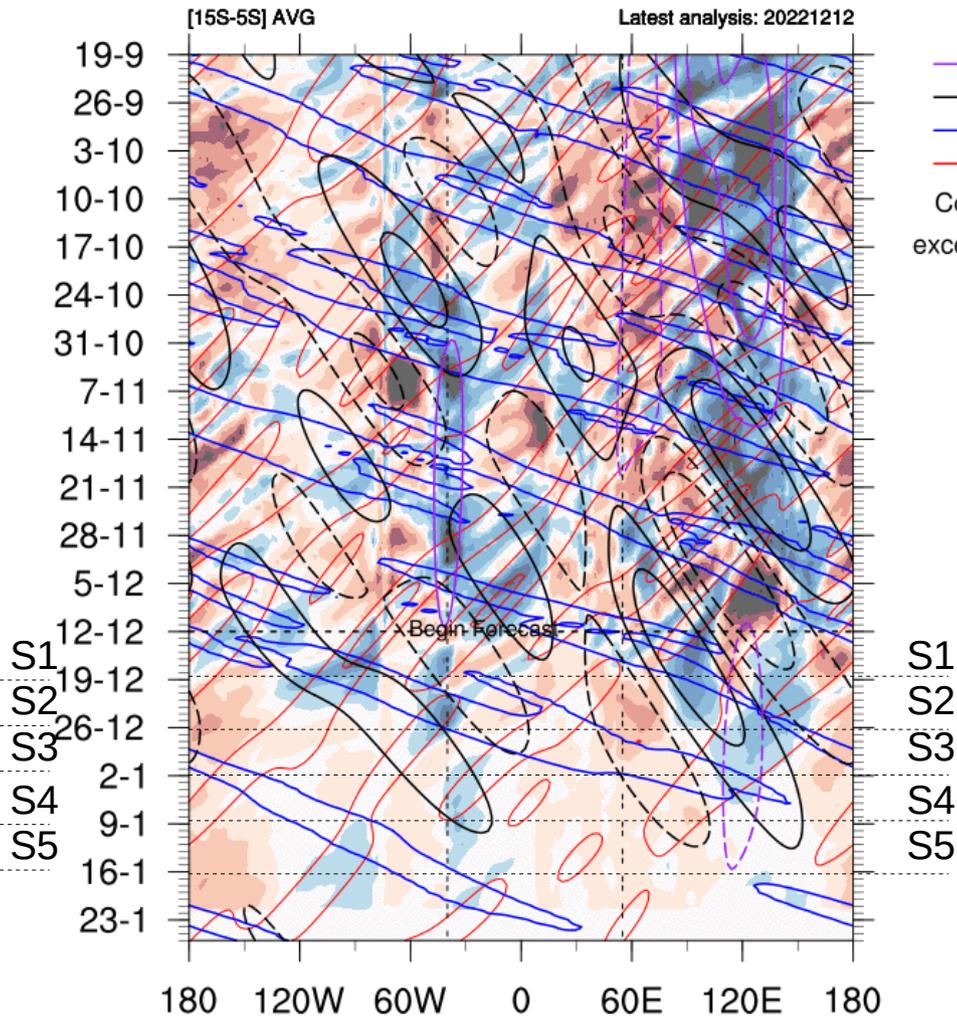
# 3. Ondes équatoriales

sf850 anomaly + Eq. Waves filtering



Contact: philippe.peyrille@meteo.fr

TCWV anomaly (mm) + Eq. Waves filtering



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



Contact: philippe.peyrille@meteo.fr

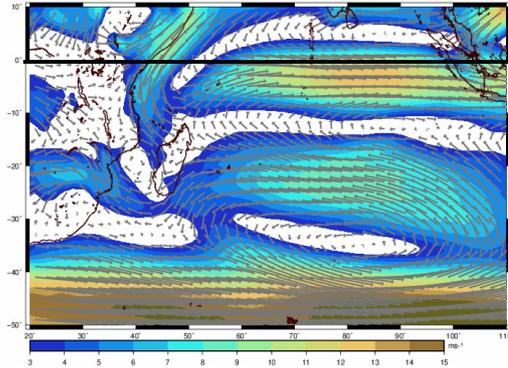
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## 4. Impacts en temps sensible, temps sévère

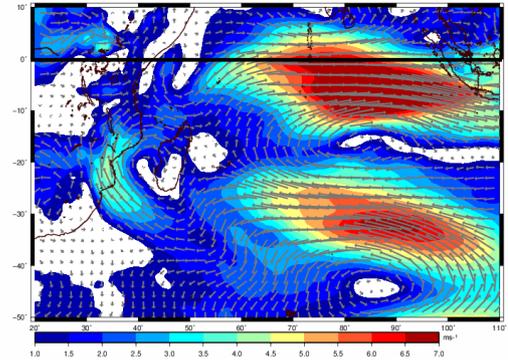
# Configuration du bassin

S2

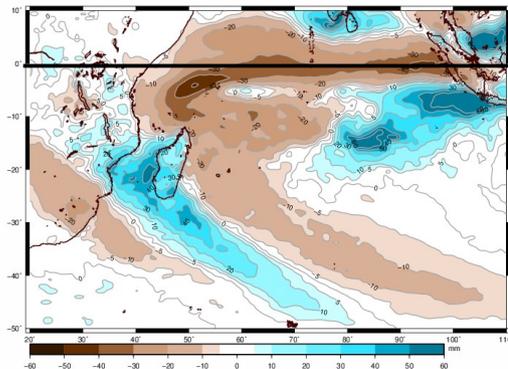
**Vent 850hPa**  
période du 2022-12-19 au 2022-12-26  
Précision mensuelle CEPMMT base 2022-12-12



**Anomalie force du vent 850hPa**  
période du 2022-12-19 au 2022-12-26  
Précision mensuelle CEPMMT base 2022-12-12

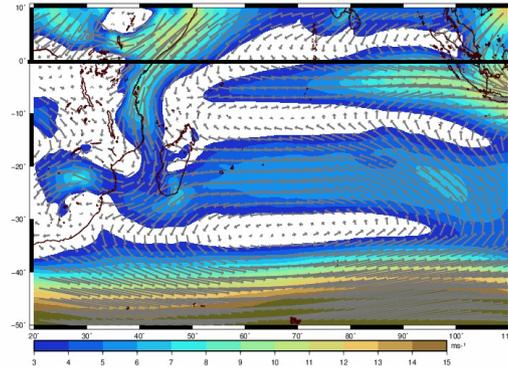


**Anomalie de précipitations**  
période du 2022-12-19 au 2022-12-26  
Précision mensuelle CEPMMT base 2022-12-12

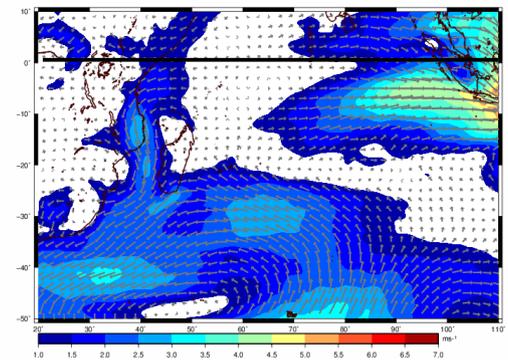


S3

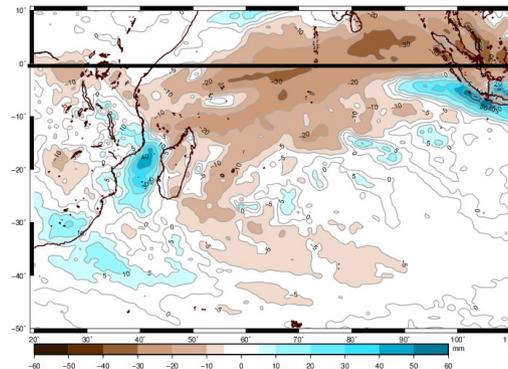
**Vent 850hPa**  
période du 2022-12-26 au 2023-01-02  
Précision mensuelle CEPMMT base 2022-12-12



**Anomalie force du vent 850hPa**  
période du 2022-12-26 au 2023-01-02  
Précision mensuelle CEPMMT base 2022-12-12

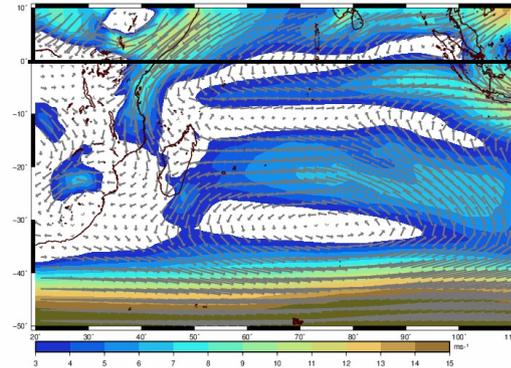


**Anomalie de précipitations**  
période du 2022-12-26 au 2023-01-02  
Précision mensuelle CEPMMT base 2022-12-12

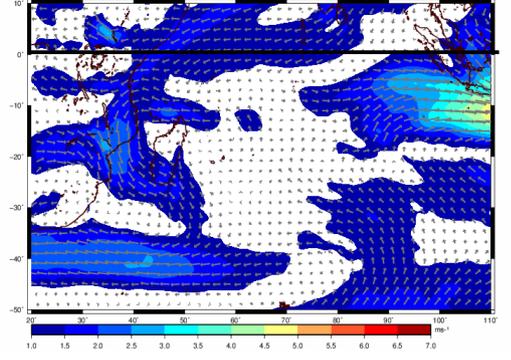


S4

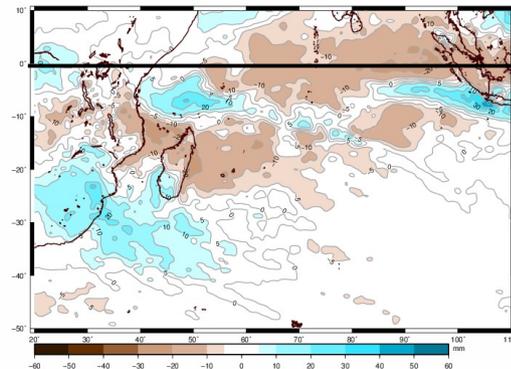
**Vent 850hPa**  
période du 2023-01-02 au 2023-01-09  
Précision mensuelle CEPMMT base 2022-12-12



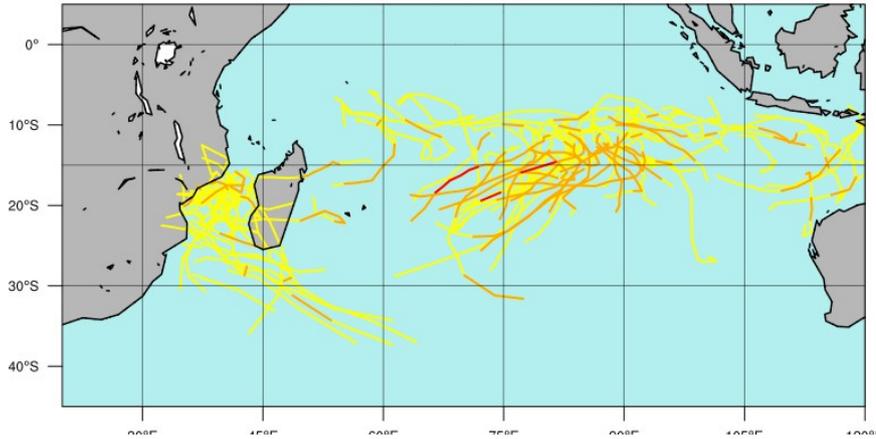
**Anomalie force du vent 850hPa**  
période du 2023-01-02 au 2023-01-09  
Précision mensuelle CEPMMT base 2022-12-12



**Anomalie de précipitations**  
période du 2023-01-02 au 2023-01-09  
Précision mensuelle CEPMMT base 2022-12-12

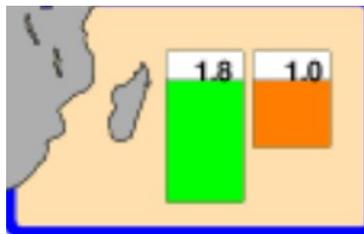
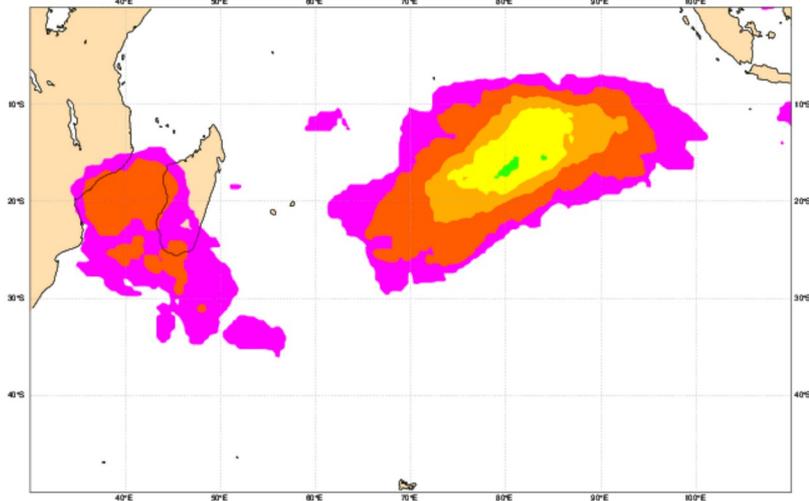


# S2 : à compléter



Weekly mean Tropical Storm Strike Probability. Date: 20221212 0 UTC t+(168-336)  
Probability of a TS passing within 300km radius

5-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90 90-110

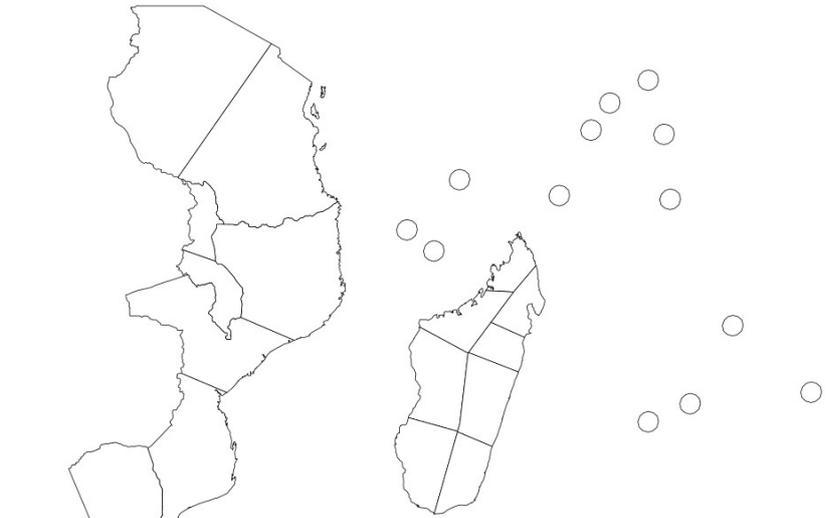


ECMWF Monthly Forecast Accumulated Cyclone Energy

Forecast Mean Climate Mean  
No Significant Significant at 5%

## Tropical Cyclone Hazard Assessment based on ECMWF strike probability monthly forecast

Week 2 starting 2022-12-19 ending 2022-12-26  
Base : 2022-12-12 00UTC



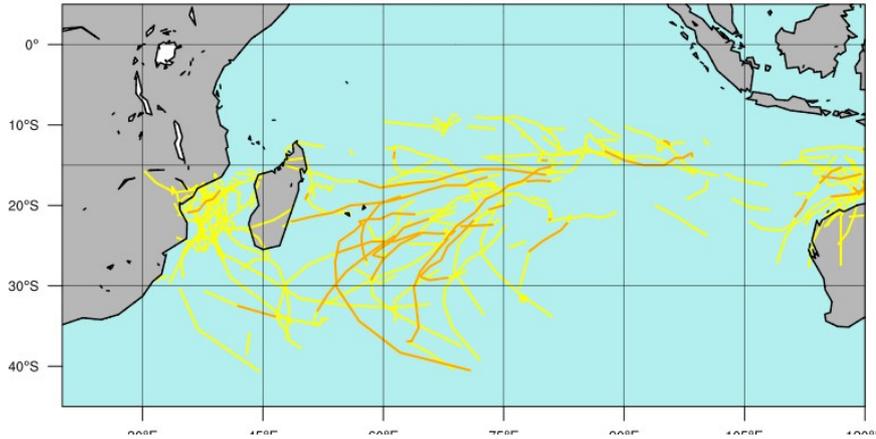
**PISSAR**

Copyright Météo-France/LACy, Experimental products resulting from research activities

Max. Hit Detection Rate Best Hit / False Alarm Rate Low False Alarm Rate

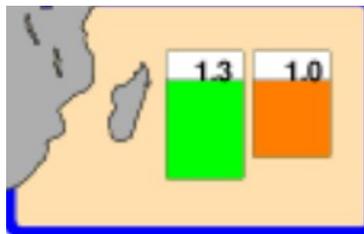
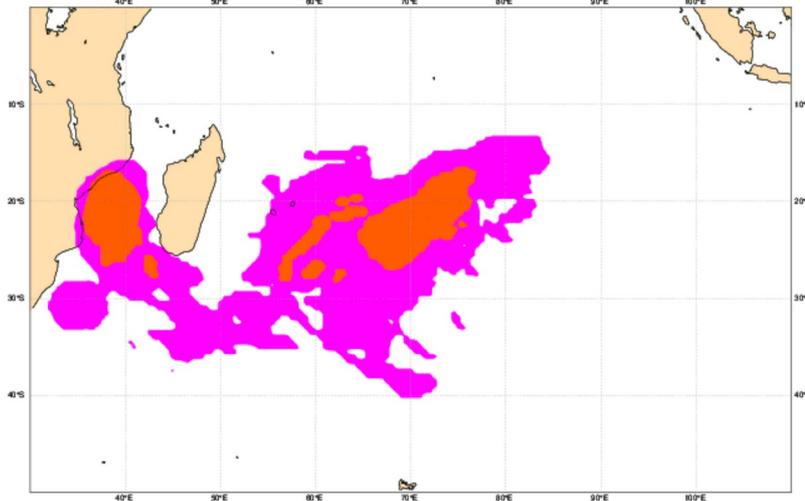
Activité cyclonique :

# S3 : à compléter



Weekly mean Tropical Storm Strike Probability. Date: 20221212 0 UTC +/- (336-504)  
Probability of a TS passing within 300km radius

5-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90 90-110

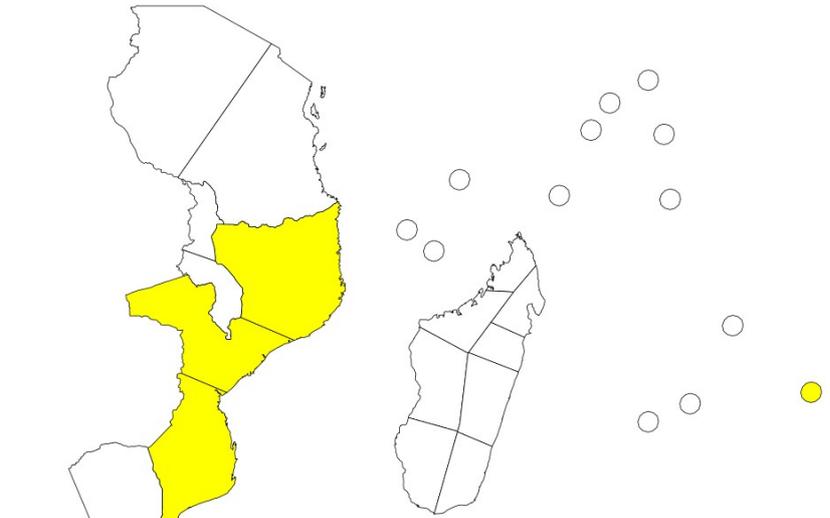


ECMWF Monthly Forecast Accumulated Cyclone Energy

Forecast Mean Climate Mean  
No Significant Significant at 5%

## Tropical Cyclone Hazard Assessment based on ECMWF strike probability monthly forecast

Week 3 starting 2022-12-26 ending 2023-01-02  
Base : 2022-12-12 00UTC



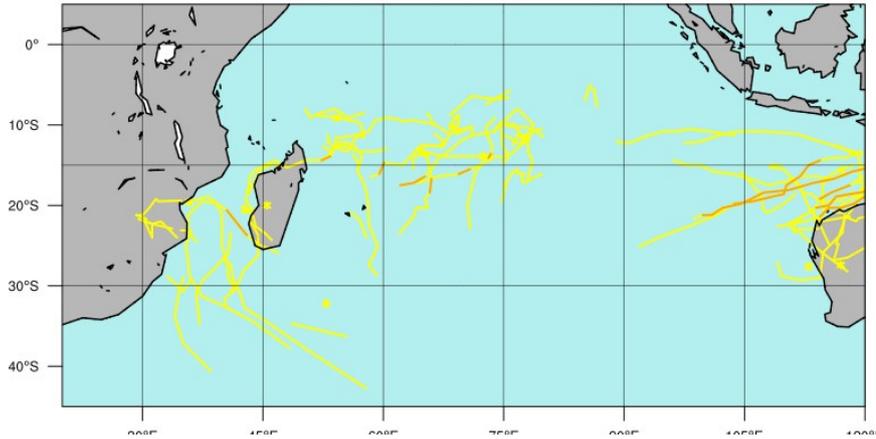
**PISSAR**

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Max. Hit Detection Rate Best Hit / False Alarm Rate Low False Alarm Rate

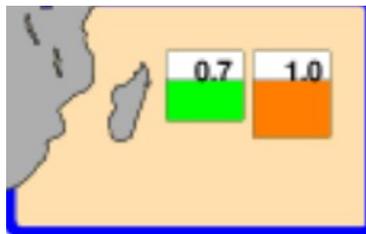
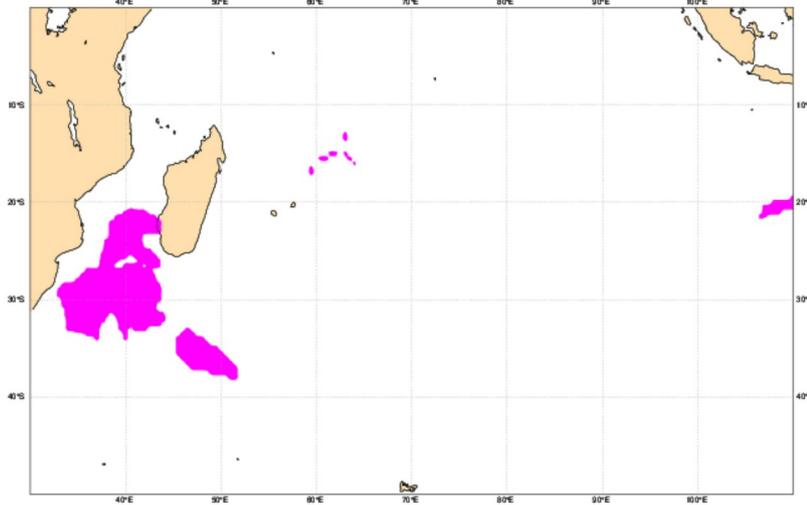
Activité cyclonique :

# S4 : à compléter



Weekly mean Tropical Storm Strike Probability. Date: 20221212 0 UTC 1+(504-672)  
Probability of a TS passing within 300km radius

5-10 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90 90-110

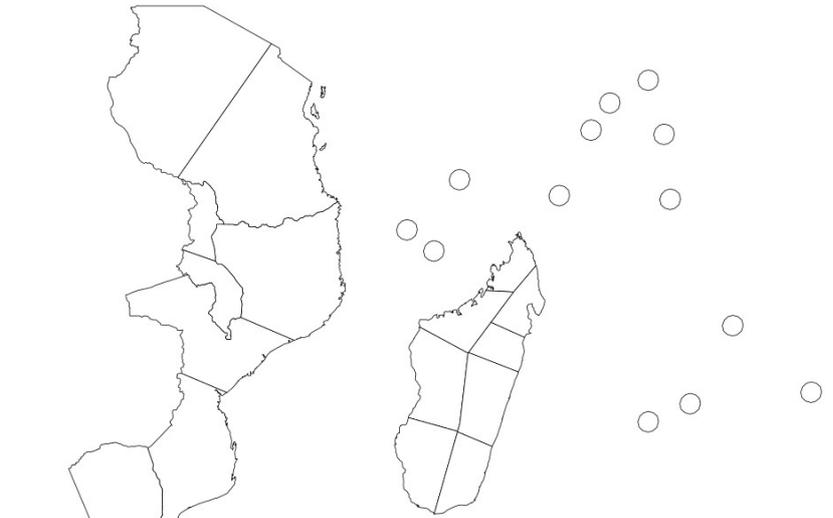


ECMWF Monthly Forecast  
Accumulated Cyclone Energy

Forecast Mean Climate Mean  
No Significant Significant at 5%

## Tropical Cyclone Hazard Assessment based on ECMWF strike probability monthly forecast

Week 4 starting 2023-01-02 ending 2023-01-09  
Base : 2022-12-12 00UTC



**PISSAR**

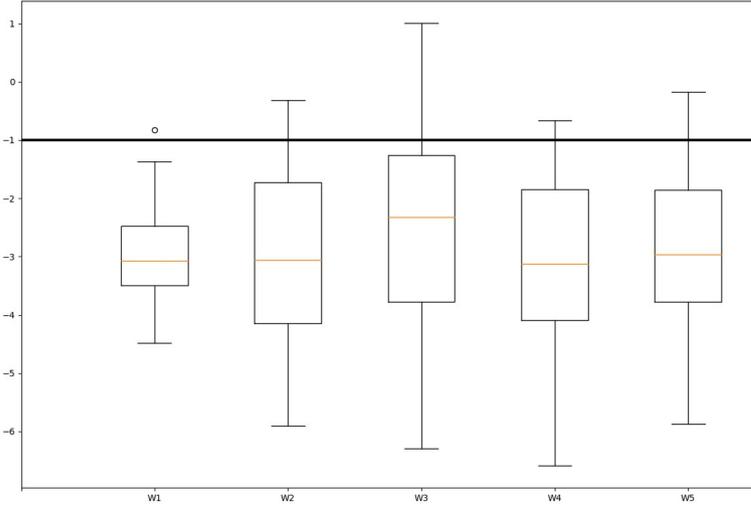
Copyright Météo-France/LACy, Experimental products resulting from research activities

Max. Hit Detection Rate Best Hit / False Alarm Rate Low False Alarm Rate

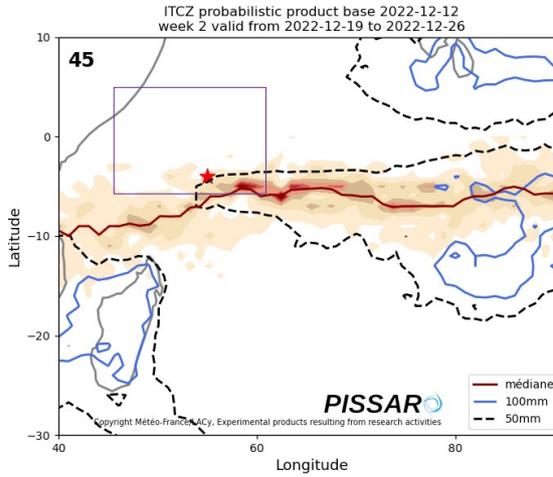
Activité cyclonique :

# Configuration du bassin et prévision ZCIT

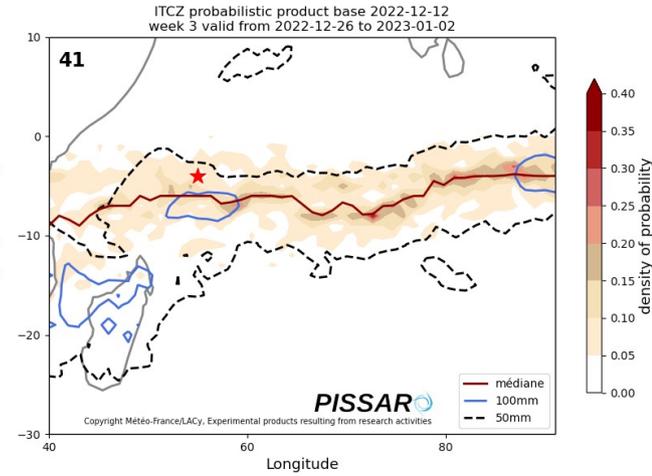
Monsoon Flux Index Monthly Forecast  
base 2022-12-12



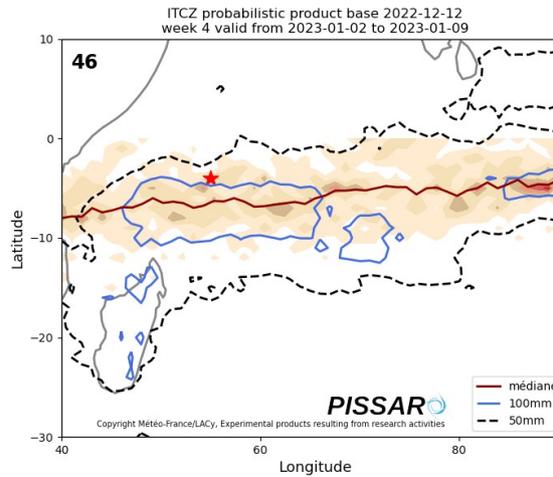
S2



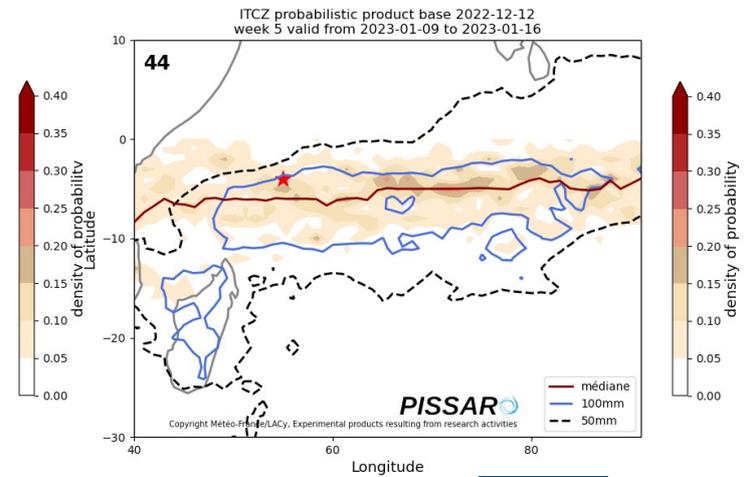
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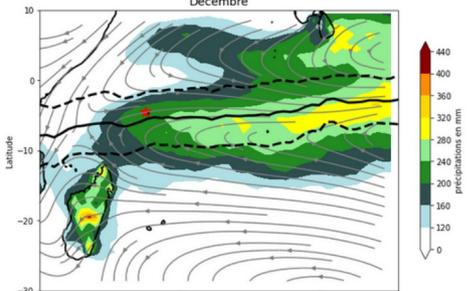
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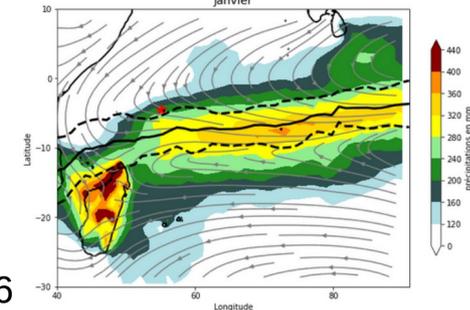
S5



Décembre

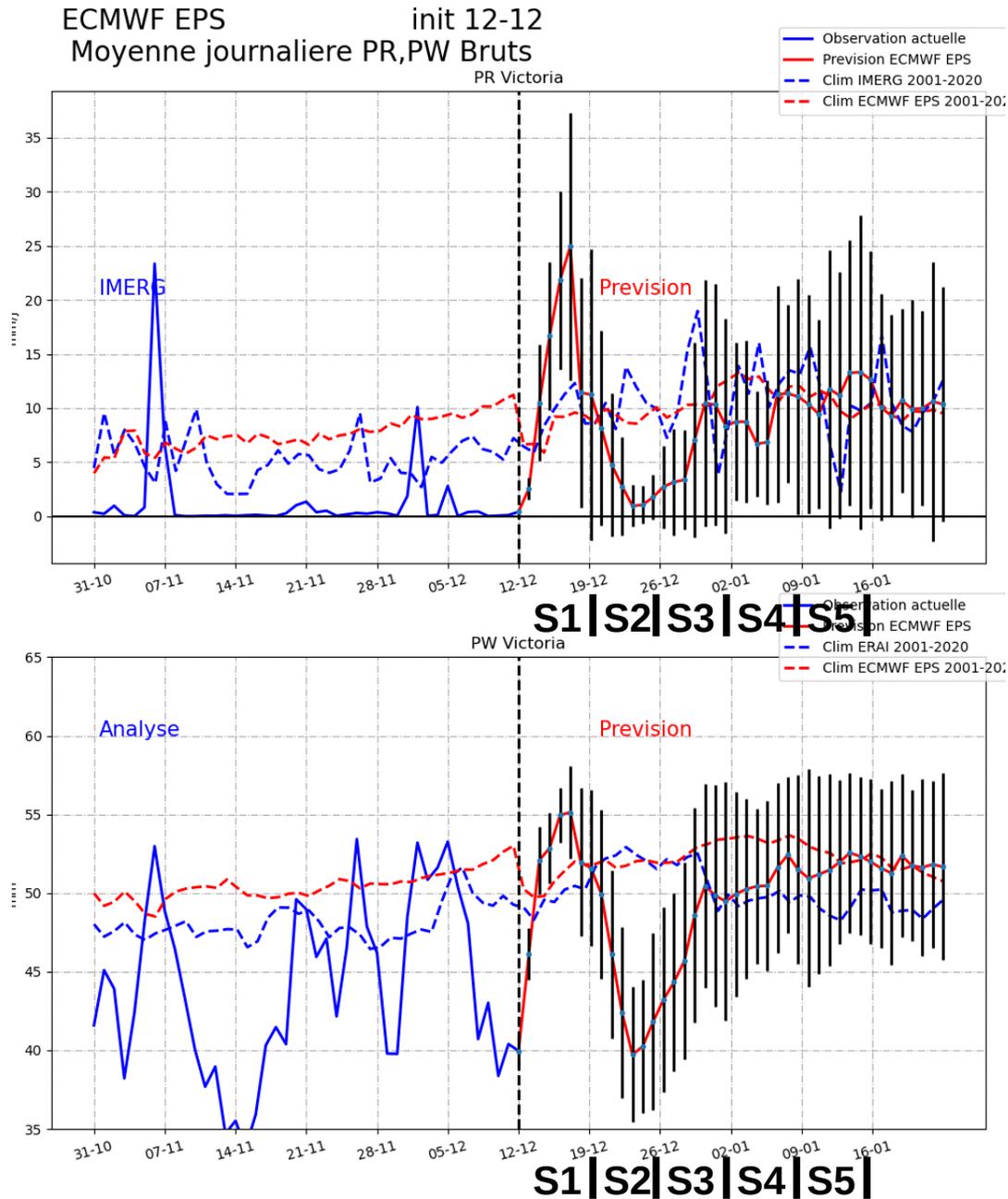


Janvier



Climatologie mensuelle

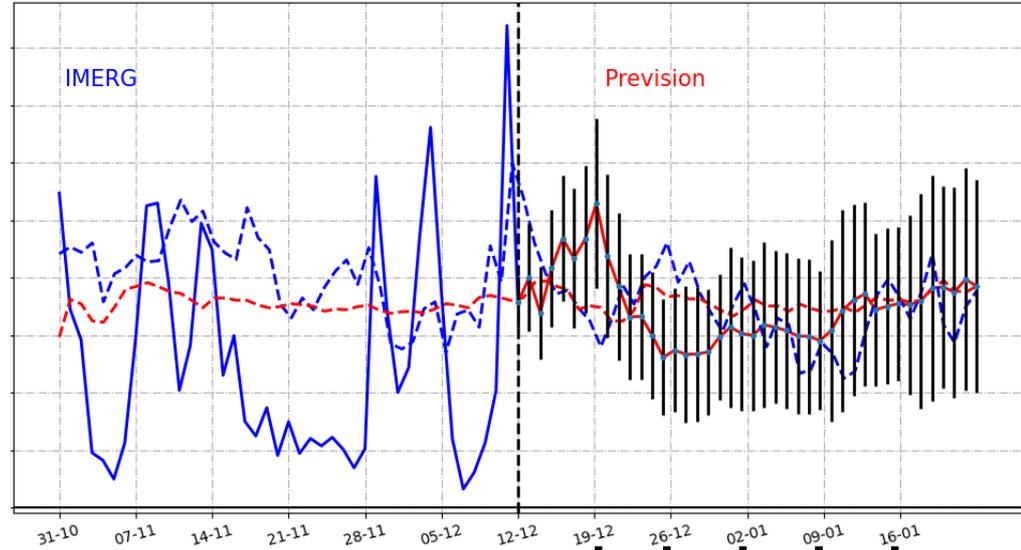
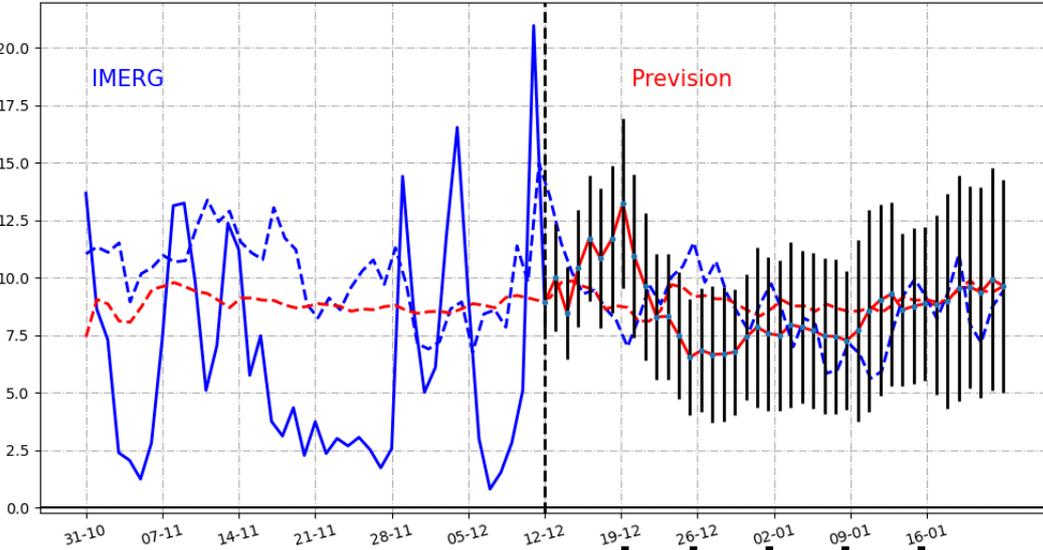
# Synthèse temps sensible S2 – S4 [SEYCHELLES]



# Synthèse temps sensible S2 – S4 [SEYCHELLES]

ECMWF EPS  
Moyenne journaliere PR,PW Bruts  
init 12-12  
PR East Indian Ocean 10S-0 , 75E-95E

ECMWF EPS  
Moyenne journaliere PR,PW Bruts  
init 12-12  
PR East Indian Ocean 10S-0 , 75E-95E

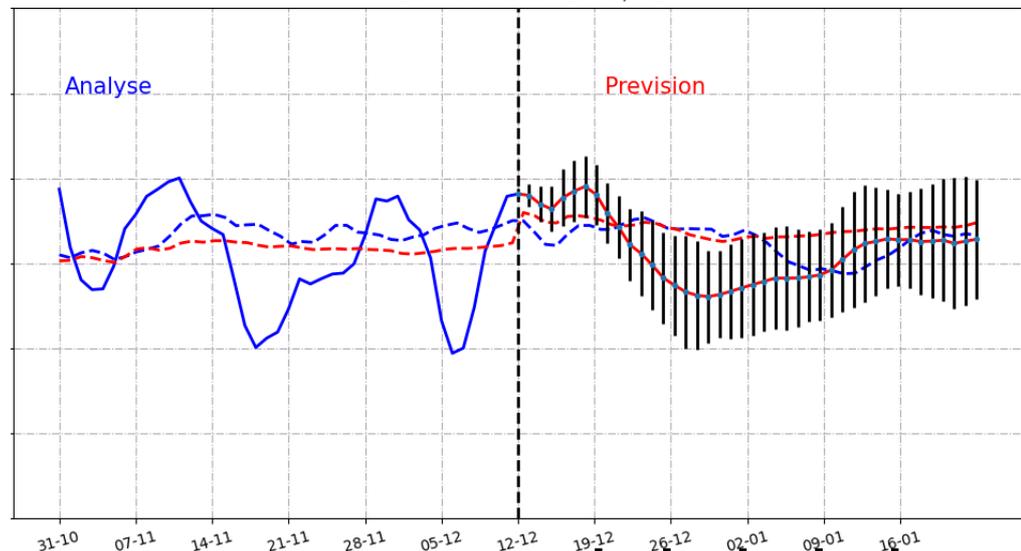
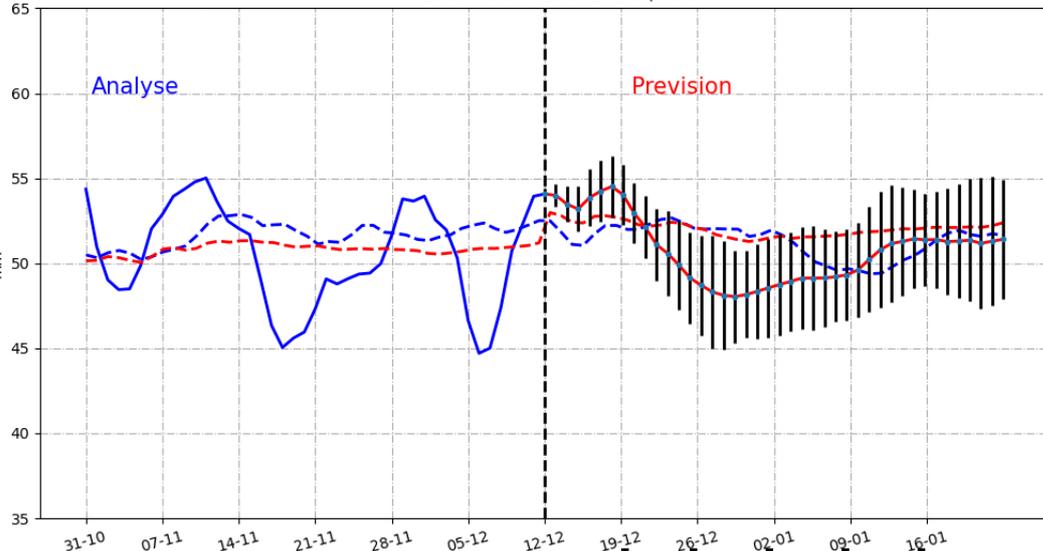


S1|S2|S3|S4|S5|

S1|S2|S3|S4|S5|

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

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



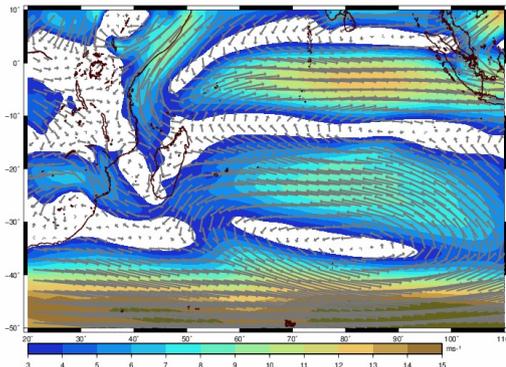
S1|S2|S3|S4|S5|

S1|S2|S3|S4|S5|

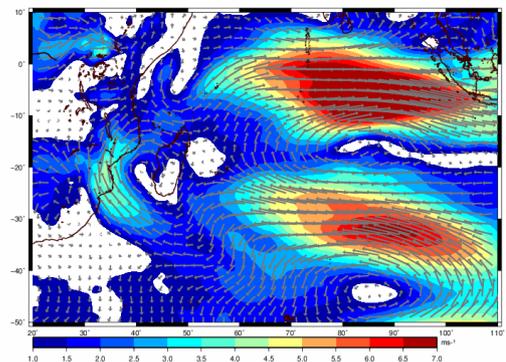
# Synthèse temps sensible S2 – S4 [MAYOTTE & REUNION]

S2

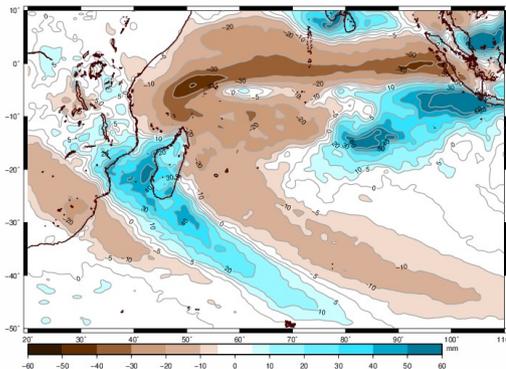
**Vent 850hPa**  
période du 2022-12-19 au 2022-12-26  
Prévision mensuelle CEPMMT base 2022-12-12



**Anomalie force du vent 850hPa**  
période du 2022-12-19 au 2022-12-26  
Prévision mensuelle CEPMMT base 2022-12-12

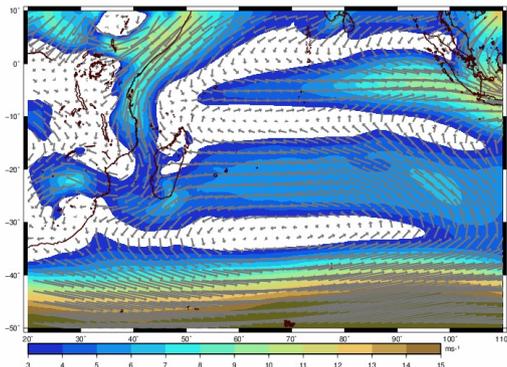


**Anomalie de précipitations**  
période du 2022-12-19 au 2022-12-26  
Prévision mensuelle CEPMMT base 2022-12-12

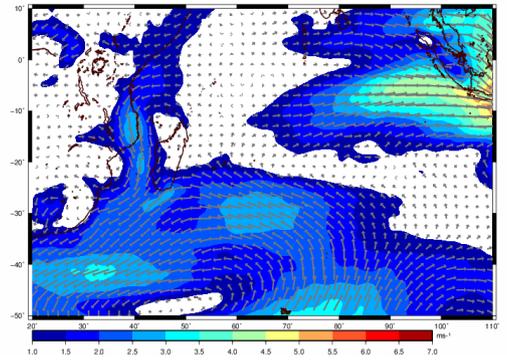


S3

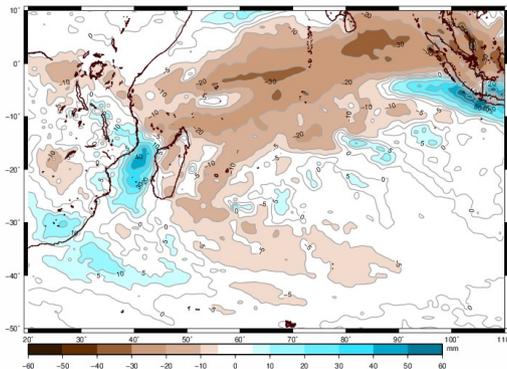
**Vent 850hPa**  
période du 2022-12-26 au 2023-01-02  
Prévision mensuelle CEPMMT base 2022-12-12



**Anomalie force du vent 850hPa**  
période du 2022-12-26 au 2023-01-02  
Prévision mensuelle CEPMMT base 2022-12-12

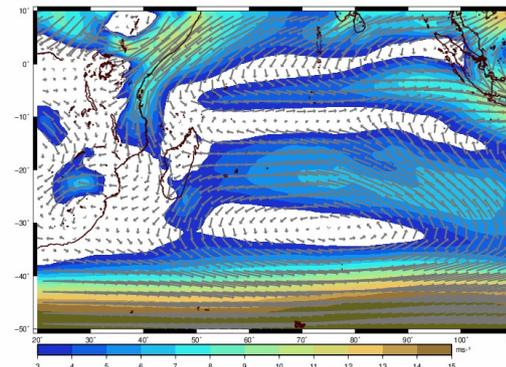


**Anomalie de précipitations**  
période du 2022-12-26 au 2023-01-02  
Prévision mensuelle CEPMMT base 2022-12-12

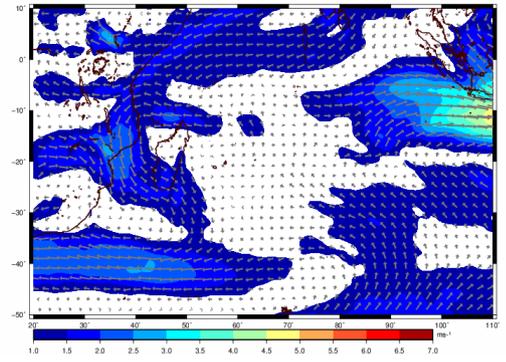


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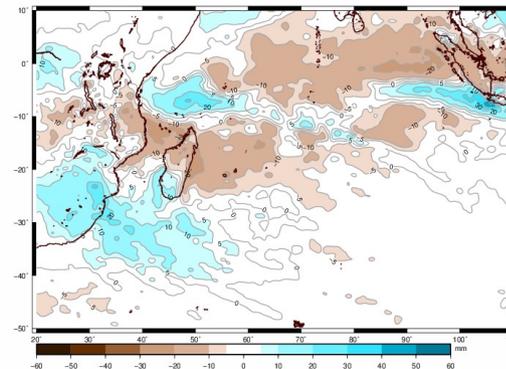
**Vent 850hPa**  
période du 2023-01-02 au 2023-01-09  
Prévision mensuelle CEPMMT base 2022-12-12



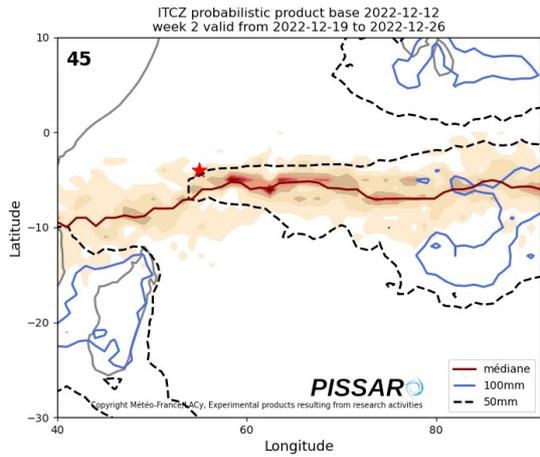
**Anomalie force du vent 850hPa**  
période du 2023-01-02 au 2023-01-09  
Prévision mensuelle CEPMMT base 2022-12-12



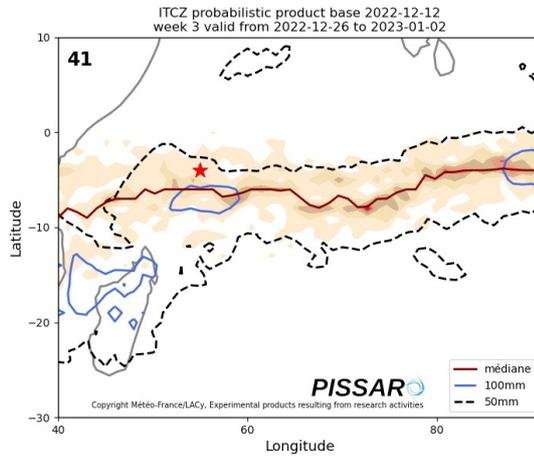
**Anomalie de précipitations**  
période du 2023-01-02 au 2023-01-09  
Prévision mensuelle CEPMMT base 2022-12-12



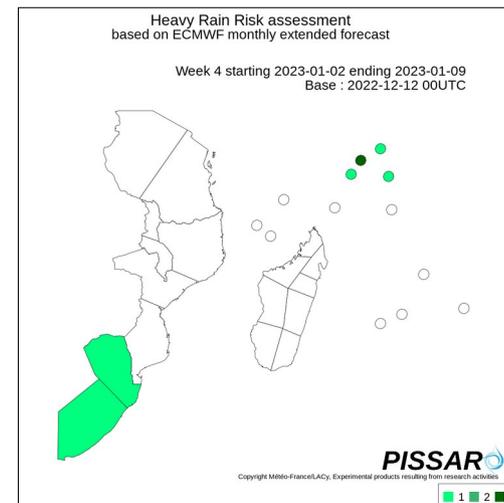
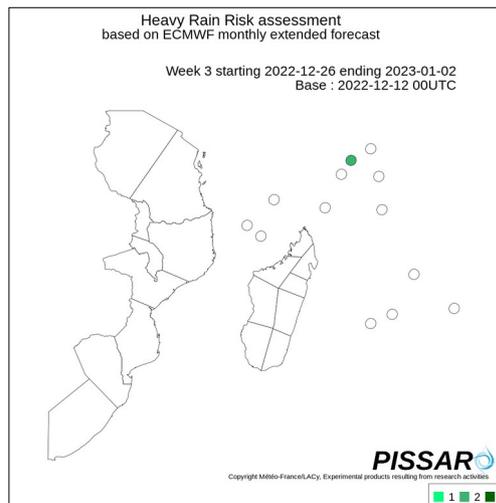
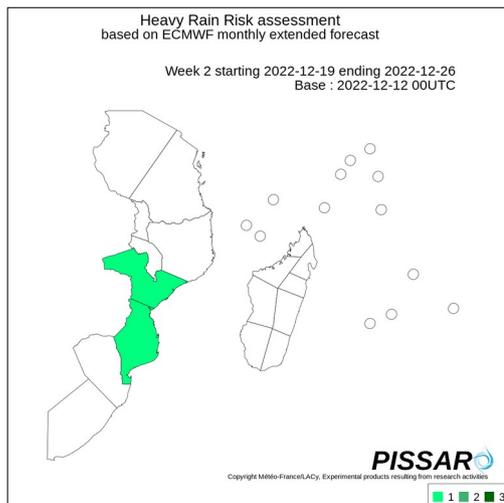
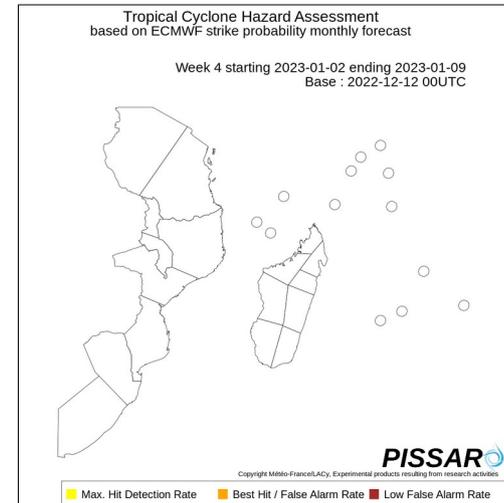
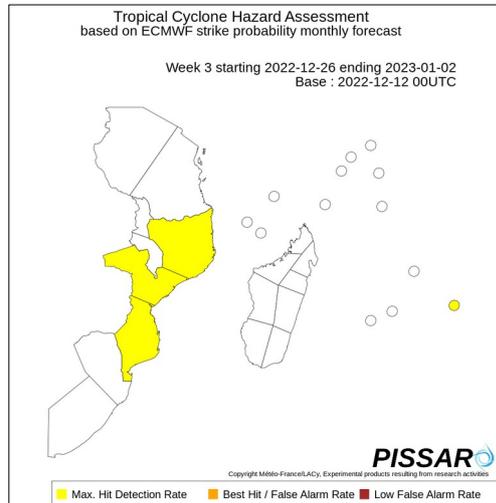
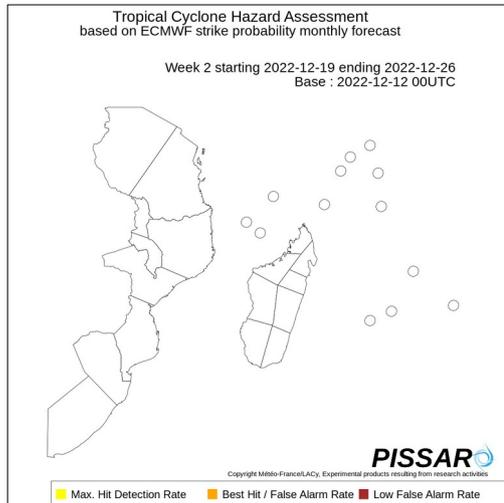
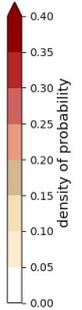
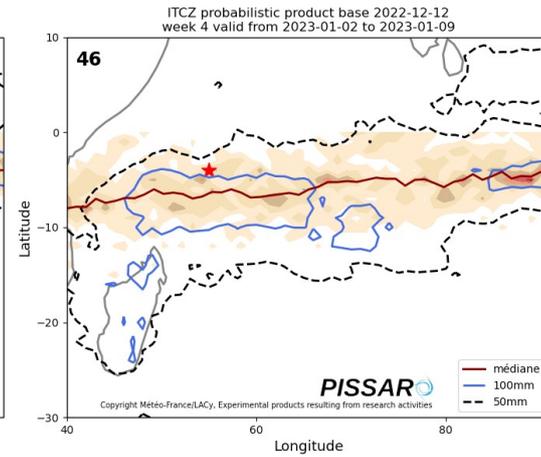
S2



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

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

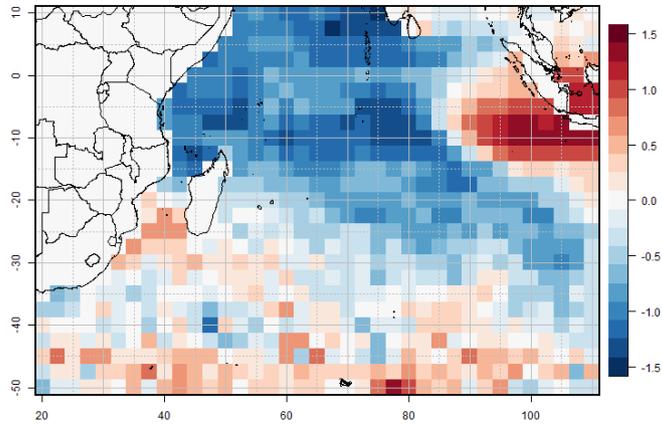
[http://www.atmos.albany.edu/student/ventrice/real\\_time/](http://www.atmos.albany.edu/student/ventrice/real_time/)

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

# Signal Basse Fréquence - Zoom sur l'OI

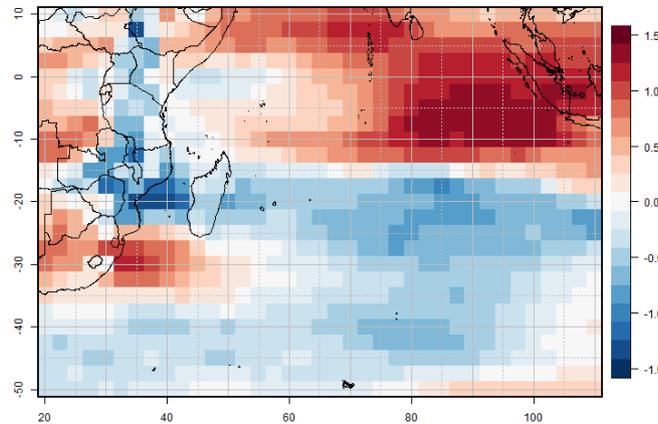
## Composite SIOD<sup>+</sup> et IOD<sup>-</sup>

ERA5 STAND. ANO. : SST SON IOD-



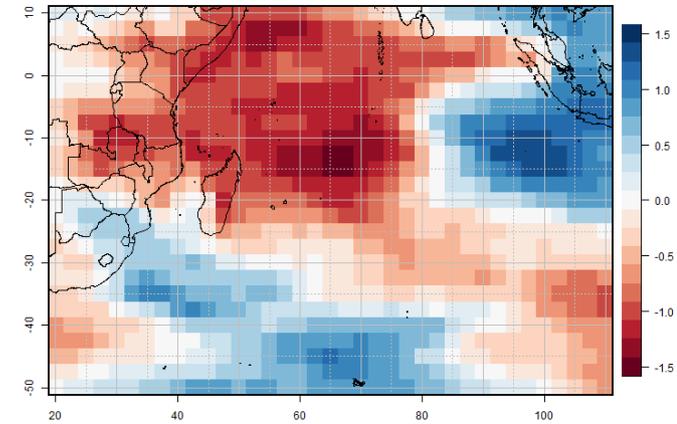
1992 - 1996 - 1998 - 2005 - 2010 - 2016

ERA5 STAND. ANO. : U850 SON IOD-



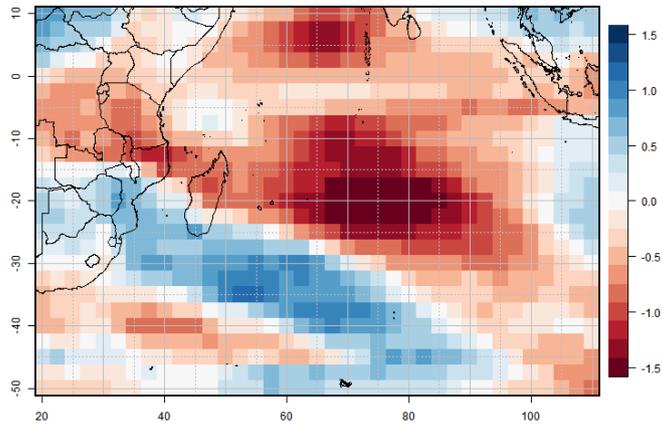
1992 - 1996 - 1998 - 2005 - 2010 - 2016

ERA5 STAND. ANO. : TCWV SON IOD-



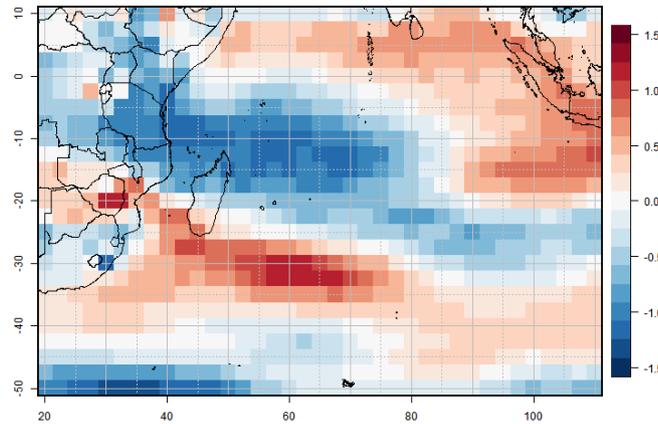
1992 - 1996 - 1998 - 2005 - 2010 - 2016

ERA5 STAND. ANO. : TCWV DJF SIOD+



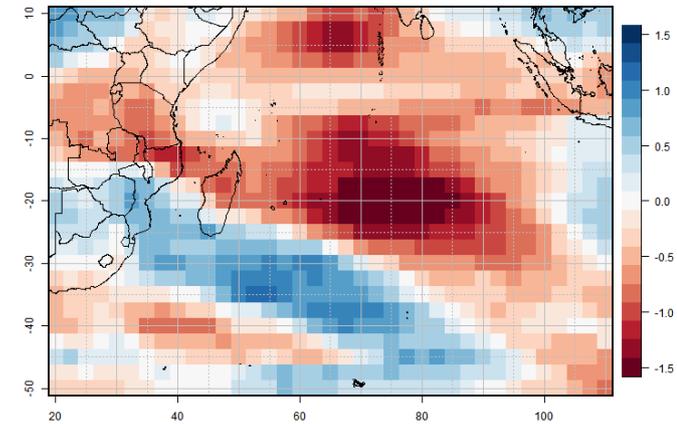
1981 - 1992 - 1998 - 2005 - 2010 - 2016

ERA5 STAND. ANO. : U850 DJF SIOD+



1981 - 1992 - 1998 - 2005 - 2010 - 2016

ERA5 STAND. ANO. : TCWV DJF SIOD+



1981 - 1992 - 1998 - 2005 - 2010 - 2016