GOBIERNO DE ESPAÑA

MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

AEMet
Agencia Estatal de Meteorología

VERIFICACIÓN DE LA PREDICCIÓN DE CICLONES DURANTE LA CAMPAÑA HYMEX.
IMPACTO DE LAS OBSERVACIONES EXTRAORDINARIAS

A tool for assessing the quality of the Mediterranean cyclone forecast: a numerical index. Picornell, M. A.; Jansà, A.; Genovés, A. NHESS, Vol 11, Issue 6, 2011, pp.1787-1794

Reunión PREDIMED 2014A. 5-6 Junio 2014

SOP1 HYMEX

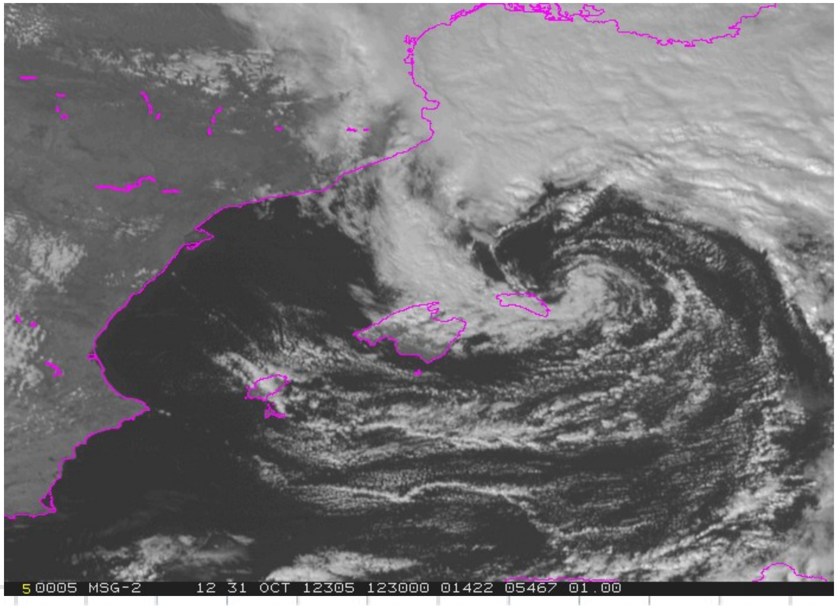
. Strong cyclogenesis during IOP18 30-31 October 2012

A cyclone tracked along NW Mediterranean (986 hPa)

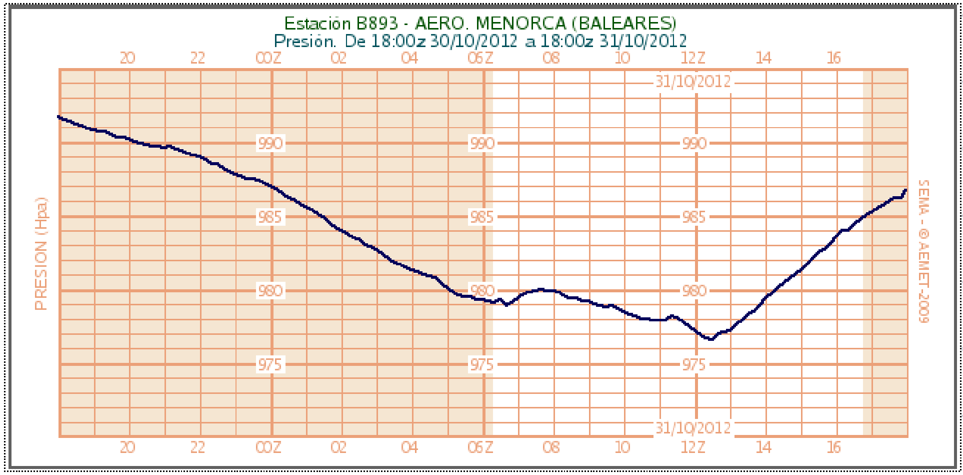
. Heavy rain in Catalonia (110mm/24h, 83mm/24h)

. Strong wind in Minorca (39/63kt)

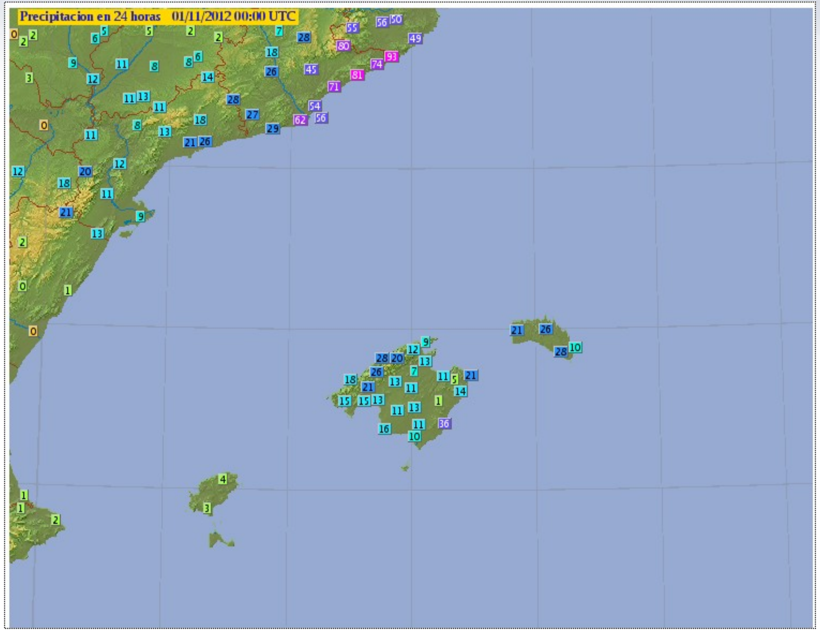
. Heavy precipitation in Italian regions

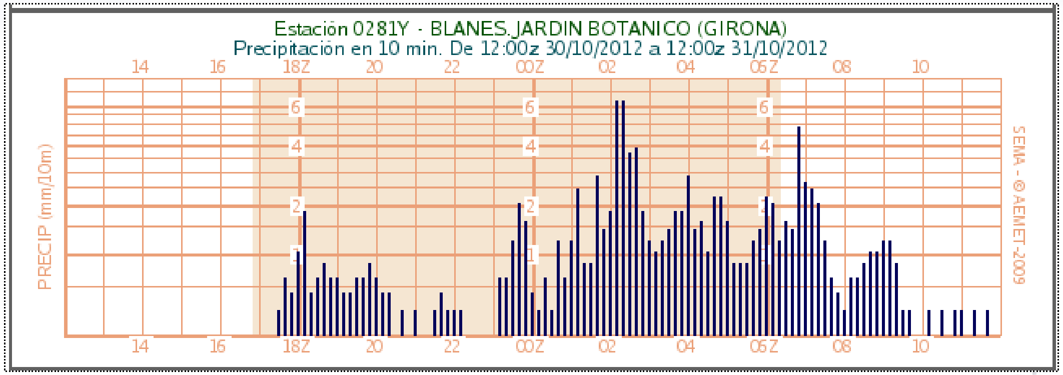

5 0005 MSG-2 12 31 OCT 12305 123000 01422 05467 01.00

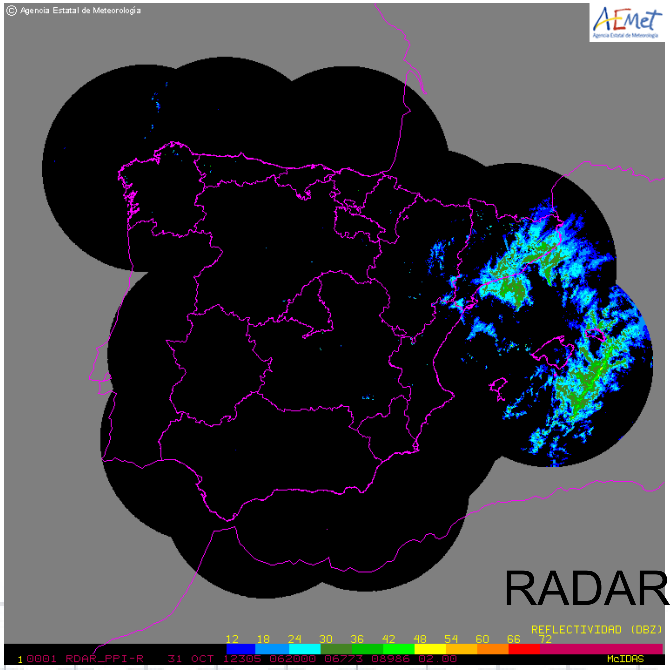
VIS 12.30Z



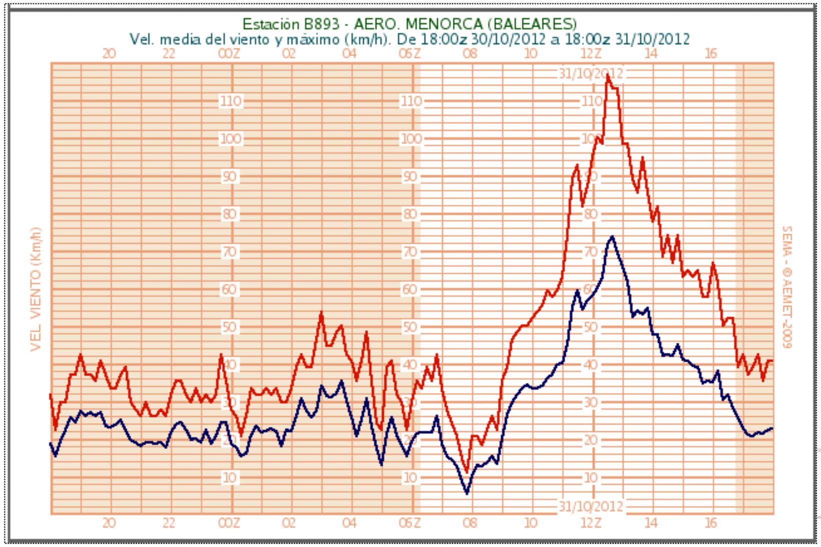
VERIFICACIÓN DE LA PREDICCIÓN DE CICLONES DURANTE LA CAMPAÑA HYMEX


Precipitacion en 24 horas 01/11/2012 00:00 UTC




© Agencia Estatal de Meteorología
AEMet
REFLECTIVIDAD (DBZ)
12 18 24 30 36 42 48 54 60 66 72
1 0001 RDAR_PPI-R 31 OCT 12305 062000 06773 08986 02 00
McIDAS

RADAR_31_0620Z



Verification of cyclone forecast

Reference error sample: 2006 ECMWF T799 (25 km)

Forecast cyclone database H+12 H+24 H+48

Analysed cyclone database

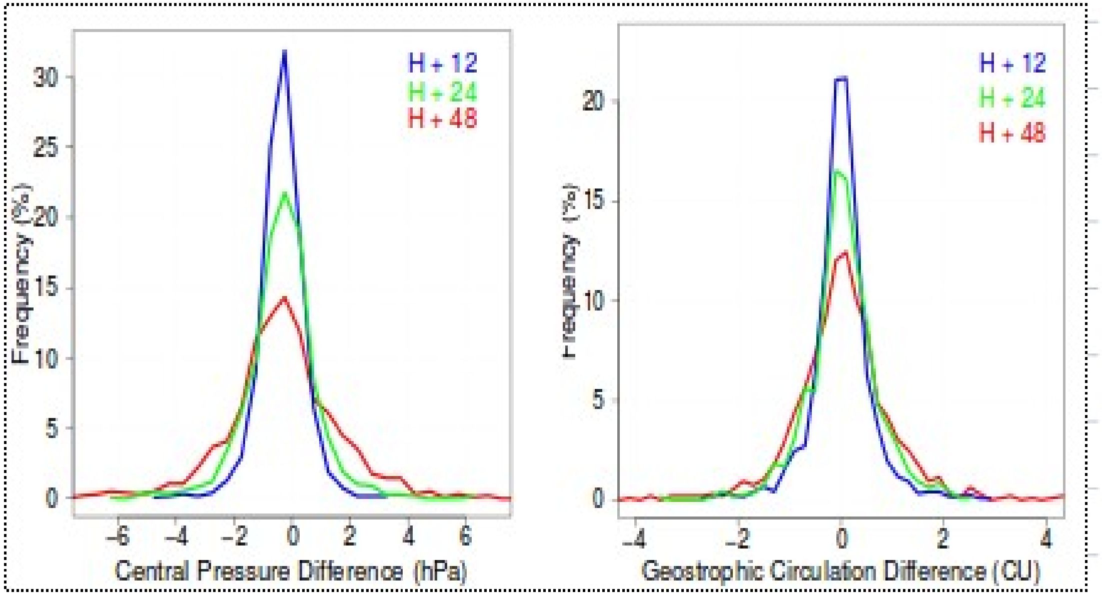
4 features:

position, id

central pressure value, ip

geostrophic circulation, ic

correlation 16 radii, ir



$$ic(j) = (100 - F_3(j))/n$$

[0,25]

Perfect forecast ic=25

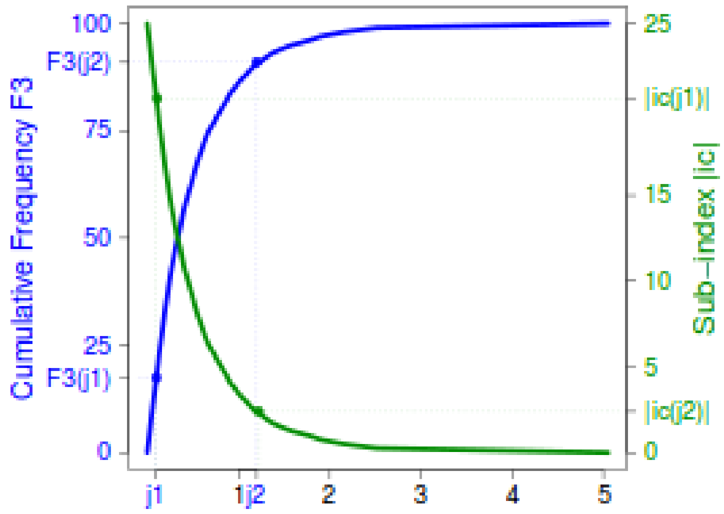


Fig. 4. Cumulative frequency (%) of geostrophic circulation error (in CU), F_3 (in blue), and partial index, $|ic|$ (in green).

Index to quantify the goodness of forecast, **I(j)**

$$I(j) = |id(j)| + |ip(j)| + |ic(j)| + |ir(j)|$$

Perfect forecast: I=100

$$I(j) = 100 - \frac{F_1(j) + F_2(j) + F_3(j) + F_4(j)}{4}$$

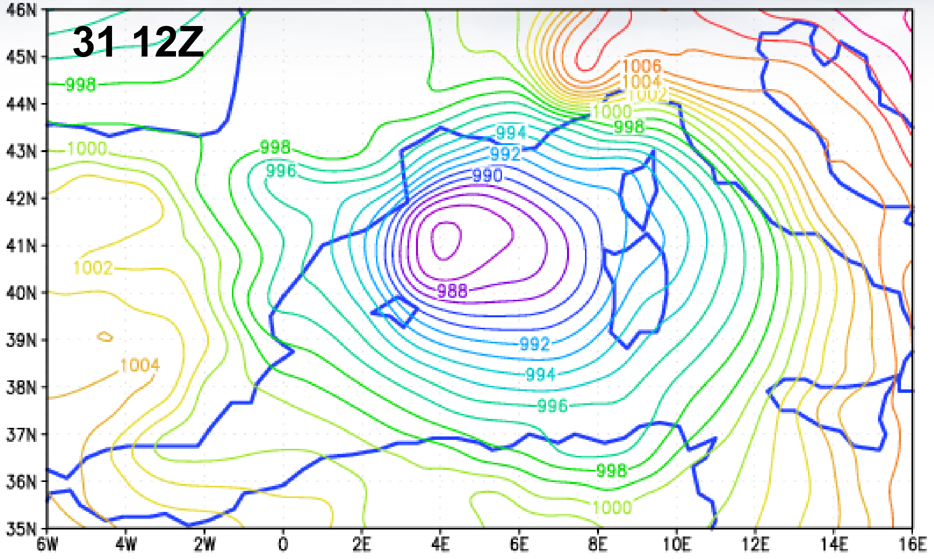
Cases in SOP1-HYMEX

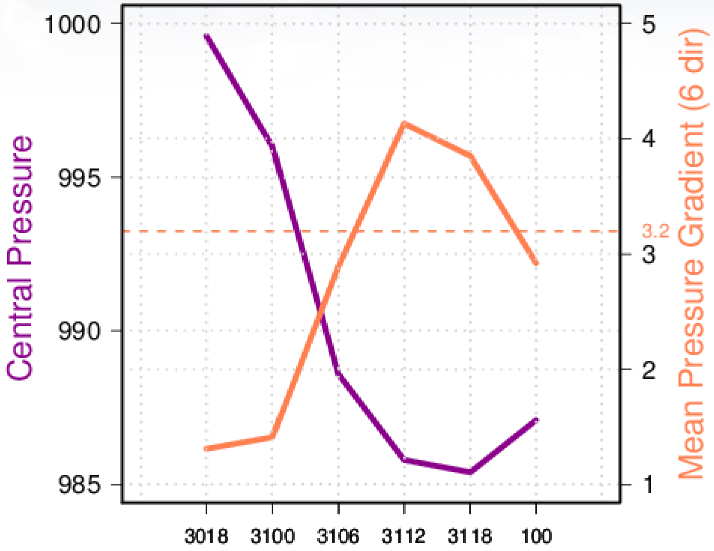
- 4 experiments HIRLAM system (15 km)

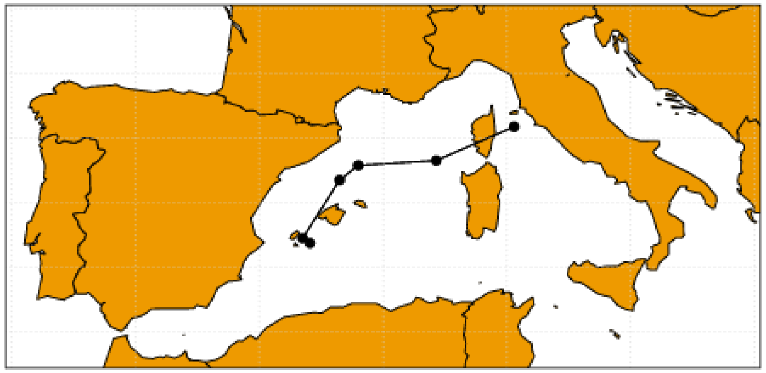
CONTROL:	No targeted observations
DTS-RS:	All the extra DTS RS (29/10 18Z -31/10 06Z 22 RS)
ATOVS*2:	All the extra DTS RS + doubled density of ATOVS data in sensitive areas (thinning at 0.45º)
ALL-RS:	All the DTS RS + RS S France (29/10 12Z -31/10 06Z 4 RS)

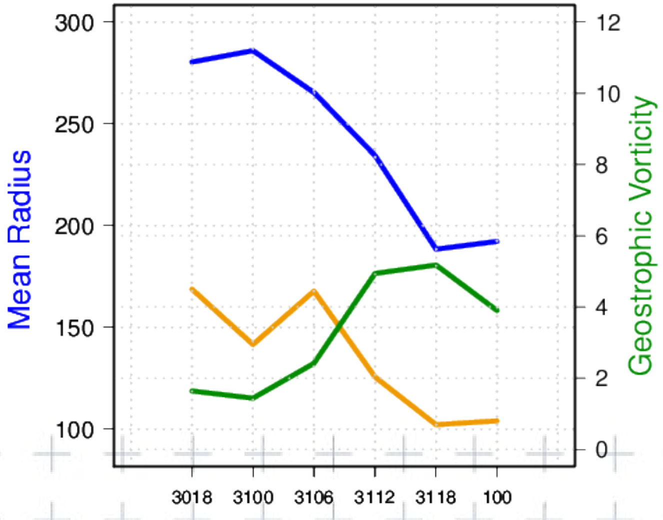
- Reference: ECMWF T1279 analyses (15km)

- ECMWF Analysis

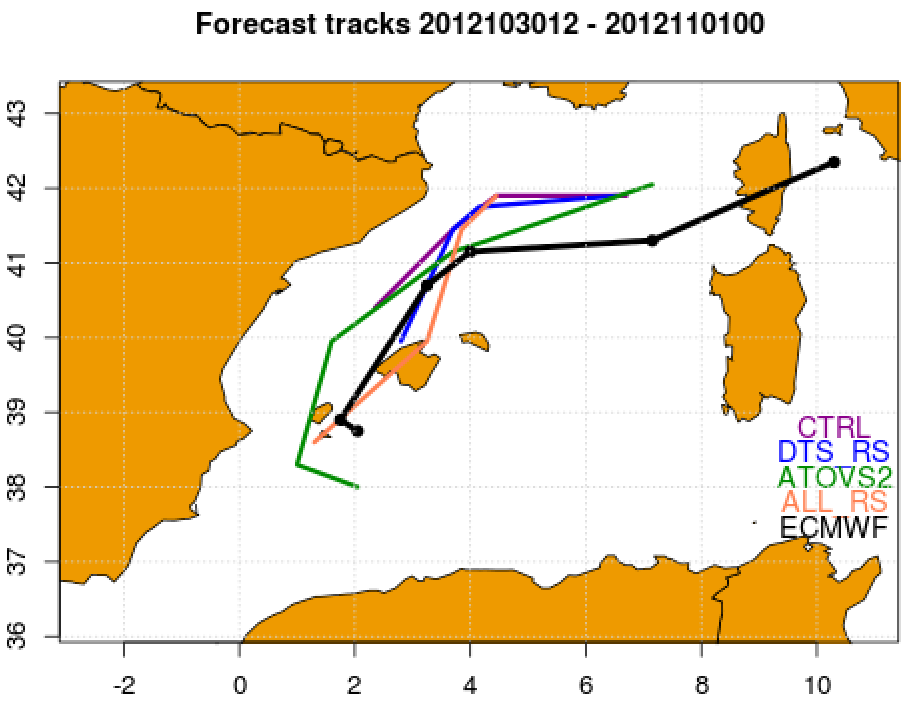

31 12Z
998
1000
1002
1004
1006
994
992
990
988
996
46N
45N
44N
43N
42N
41N
40N
39N
38N
37N
36N
35N
6W
4W
2W
0
2E
4E
6E
8E
10E
12E
14E
16E



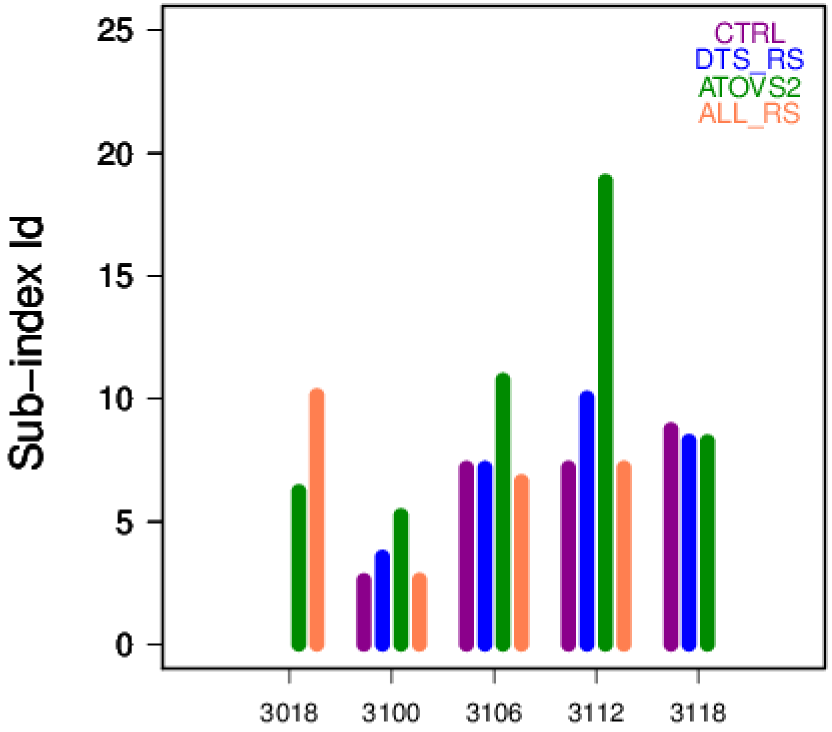




Run 201210 30 12

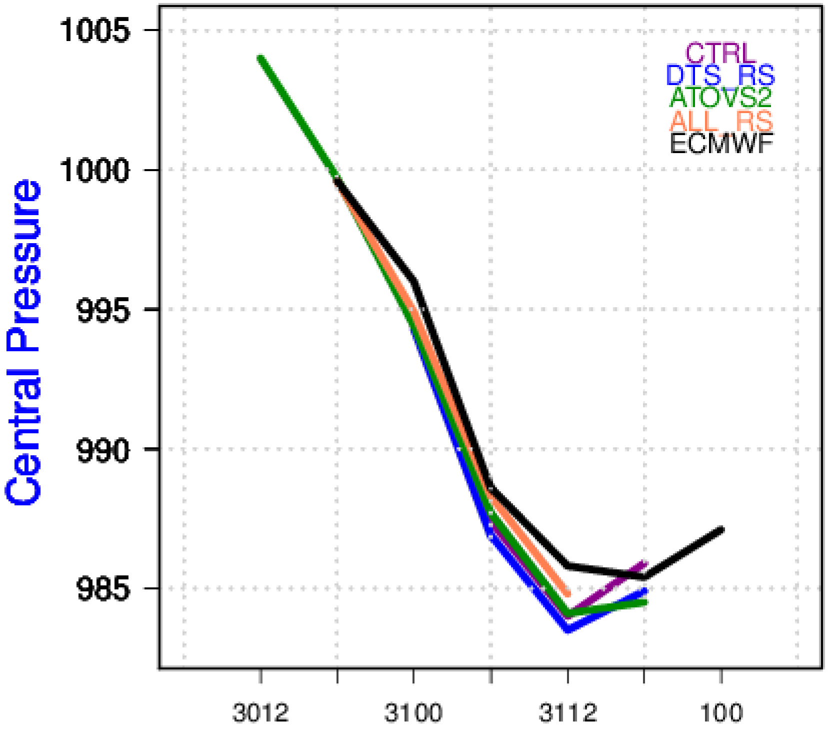

Forecast tracks 2012103012 - 2012110100
43
42
41
40
39
38
37
36
-2
0
2
4
6
8
10
CTRL
DTS_RS
ATOVS2
ALL_RS
ECMWF

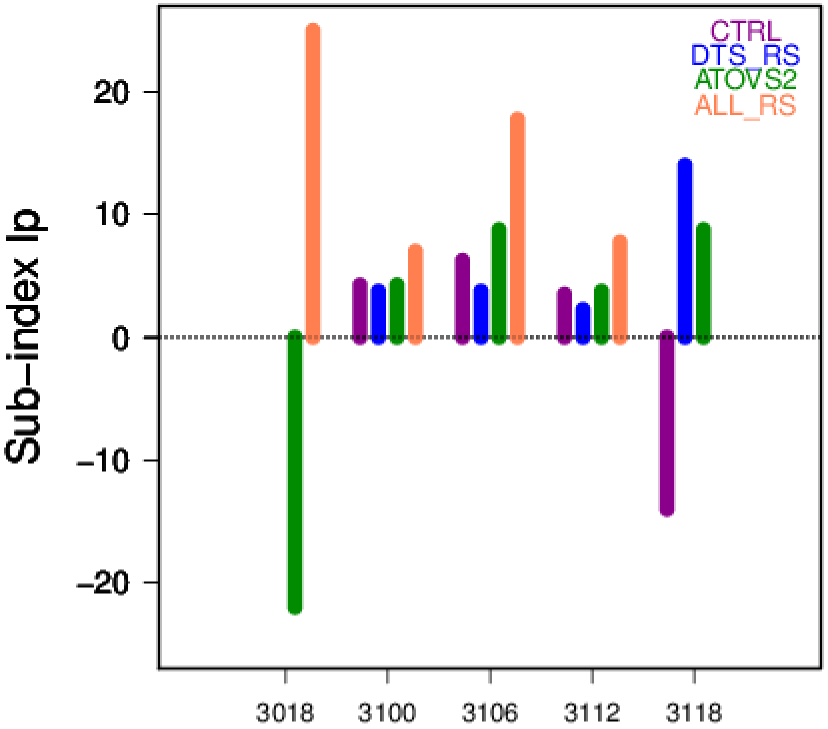
Distance



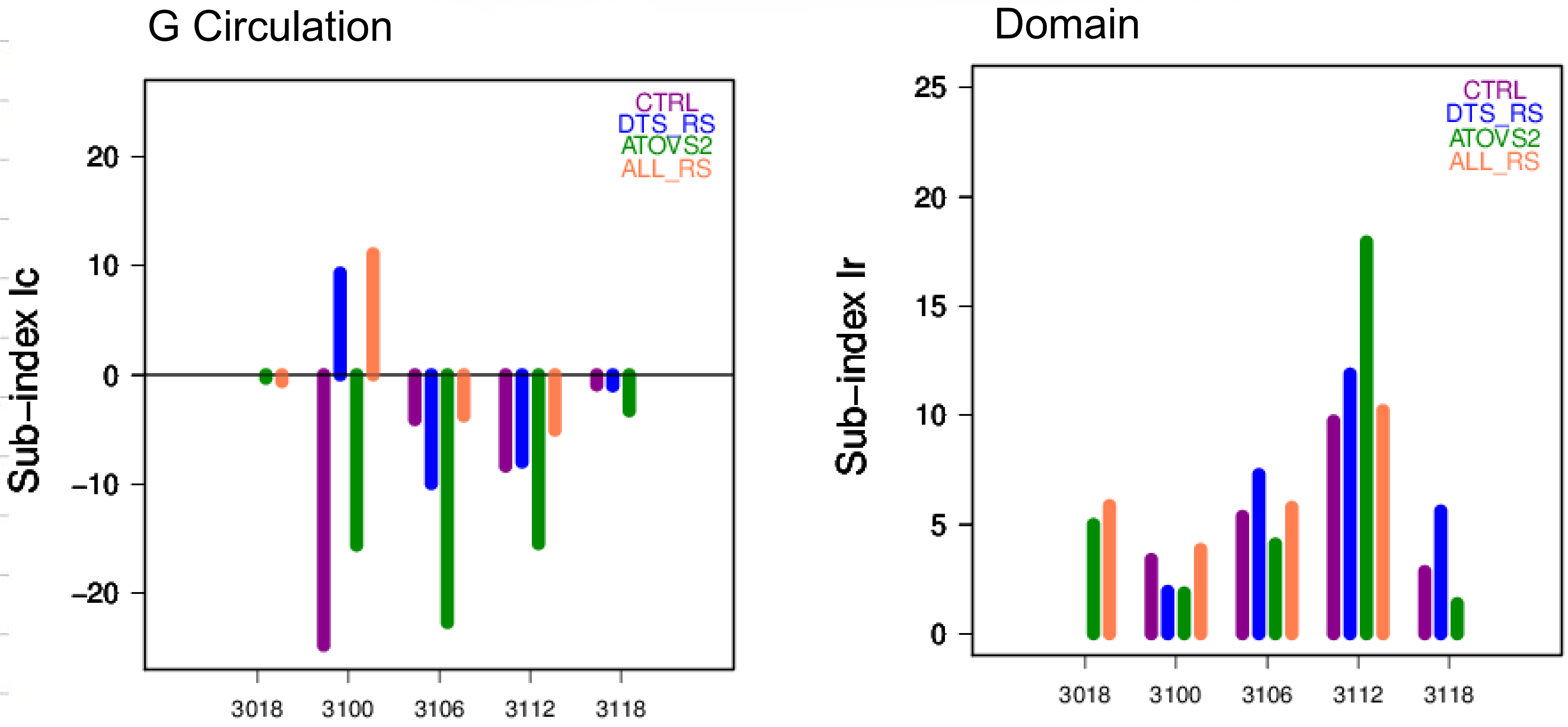
Run 201210 30 12

Central Pressure

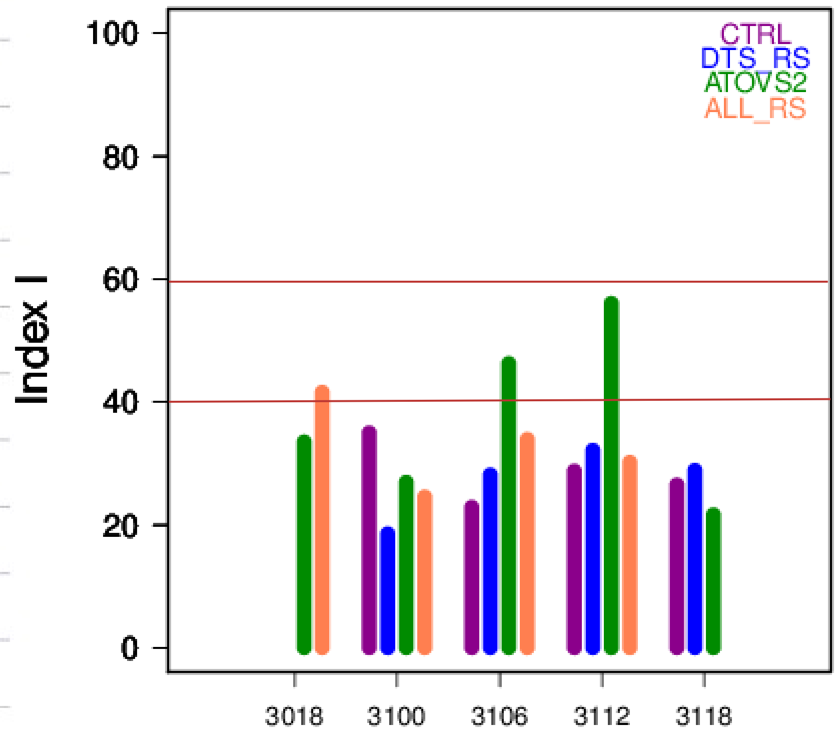




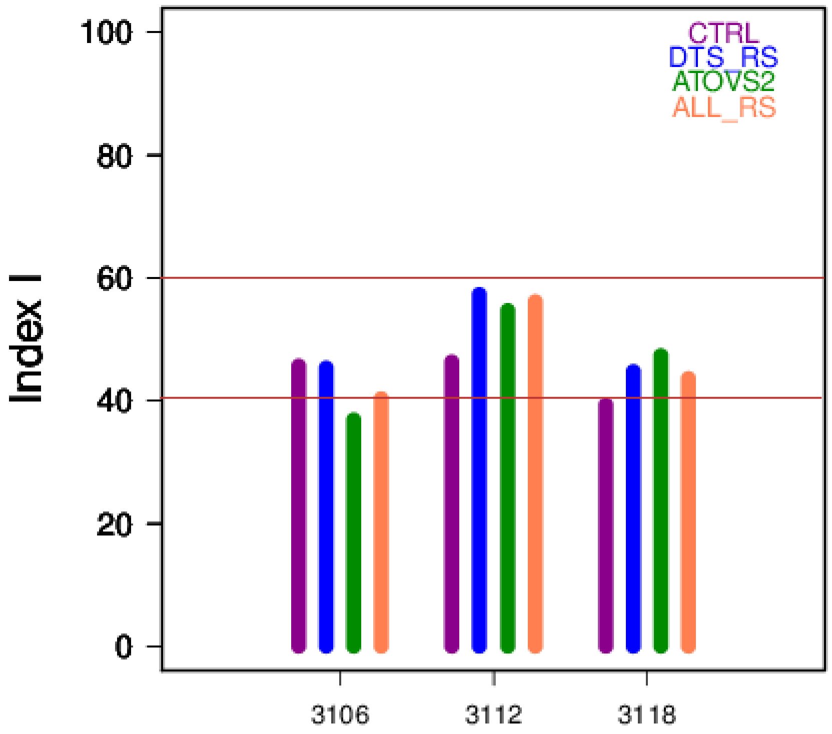
Run 201210 30 12



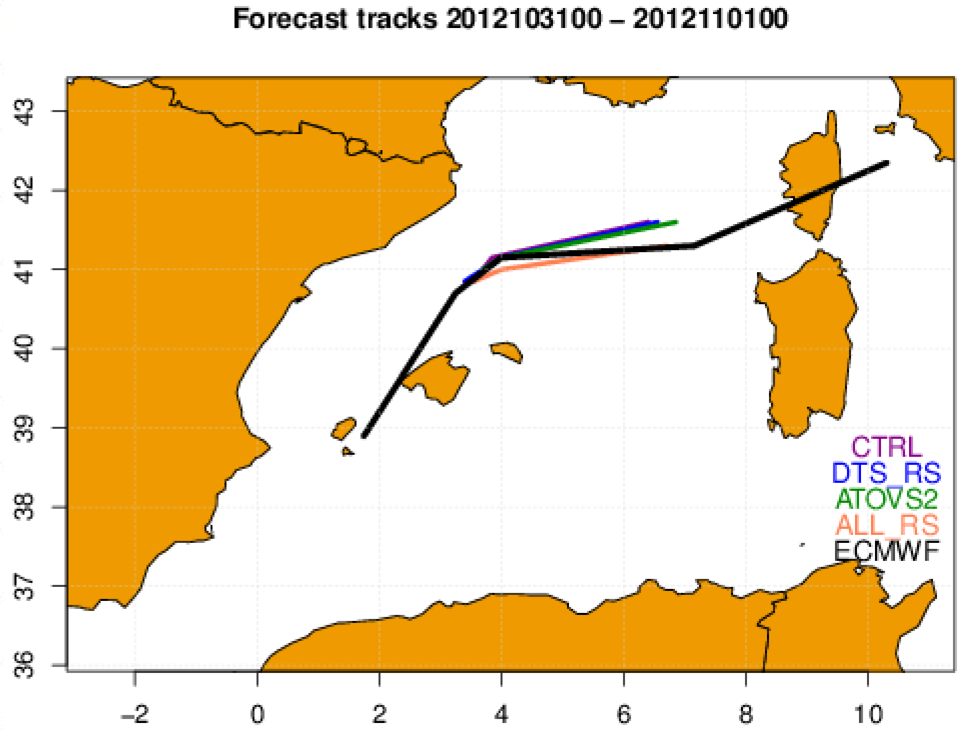
- Run 20121030 12



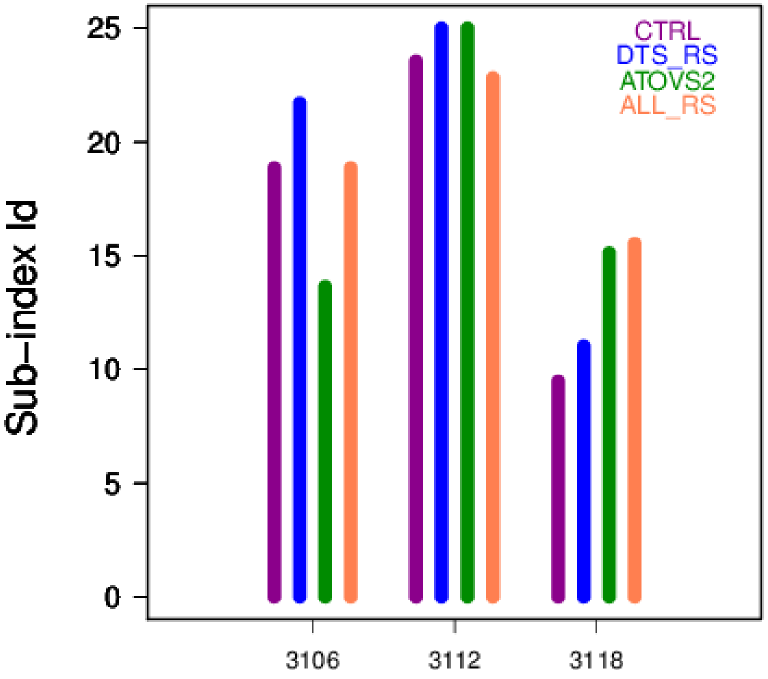
Run 20121031 06



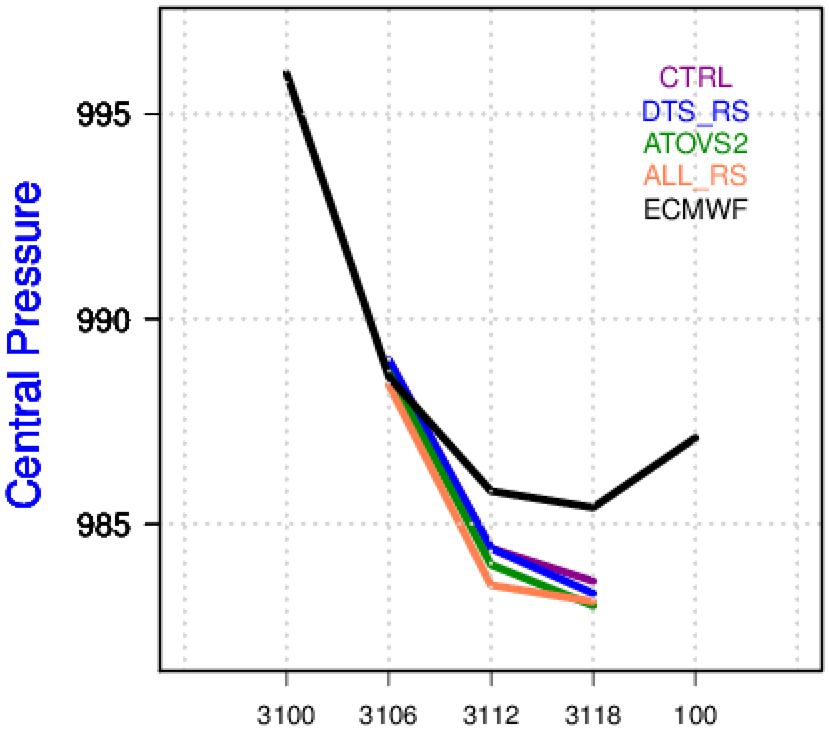
Run 201210 31 06


Forecast tracks 2012103100 – 2012110100
43
42
41
40
39
38
37
36
−2
0
2
4
6
8
10
CTRL
DTS_RS
ATOVS2
ALL_RS
ECMWF

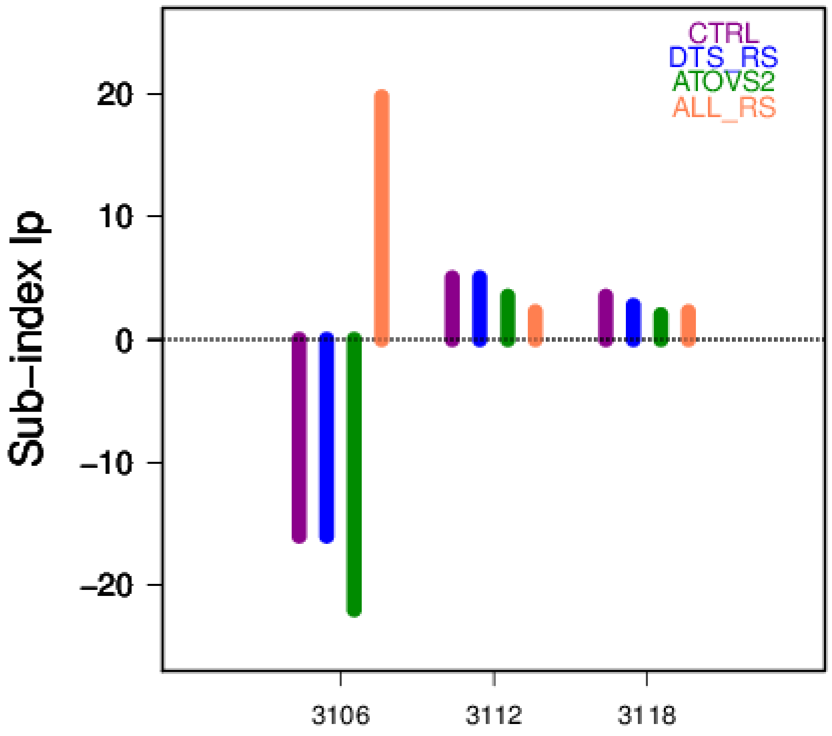
Distance

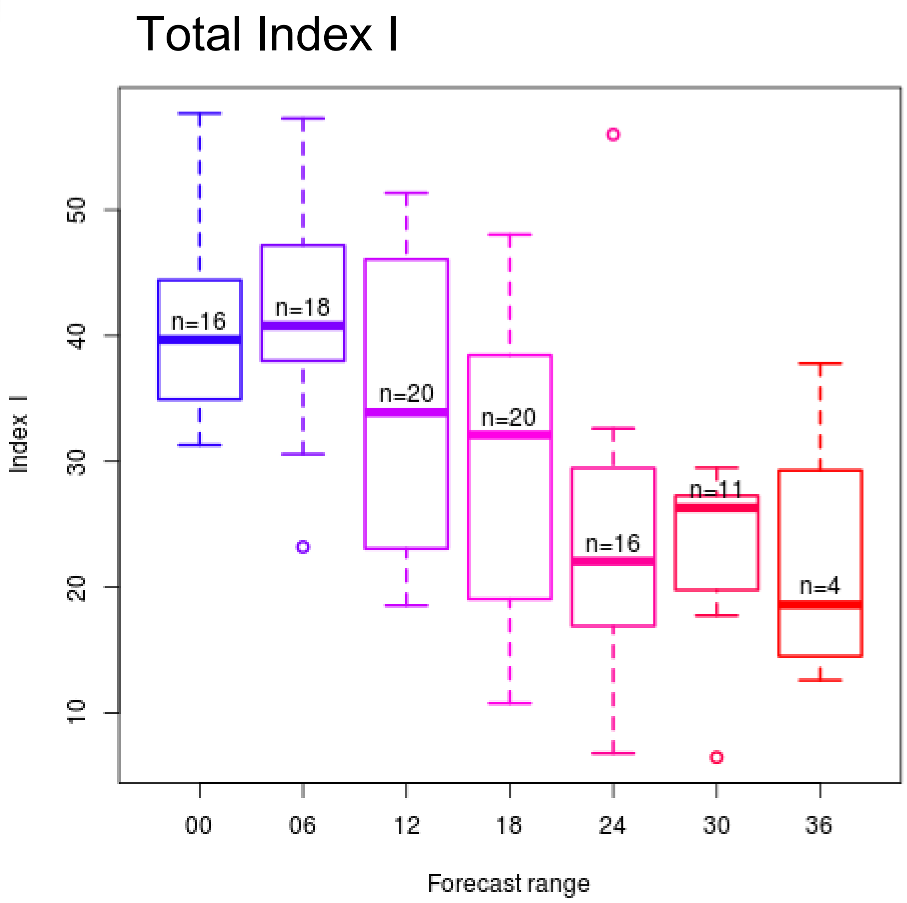


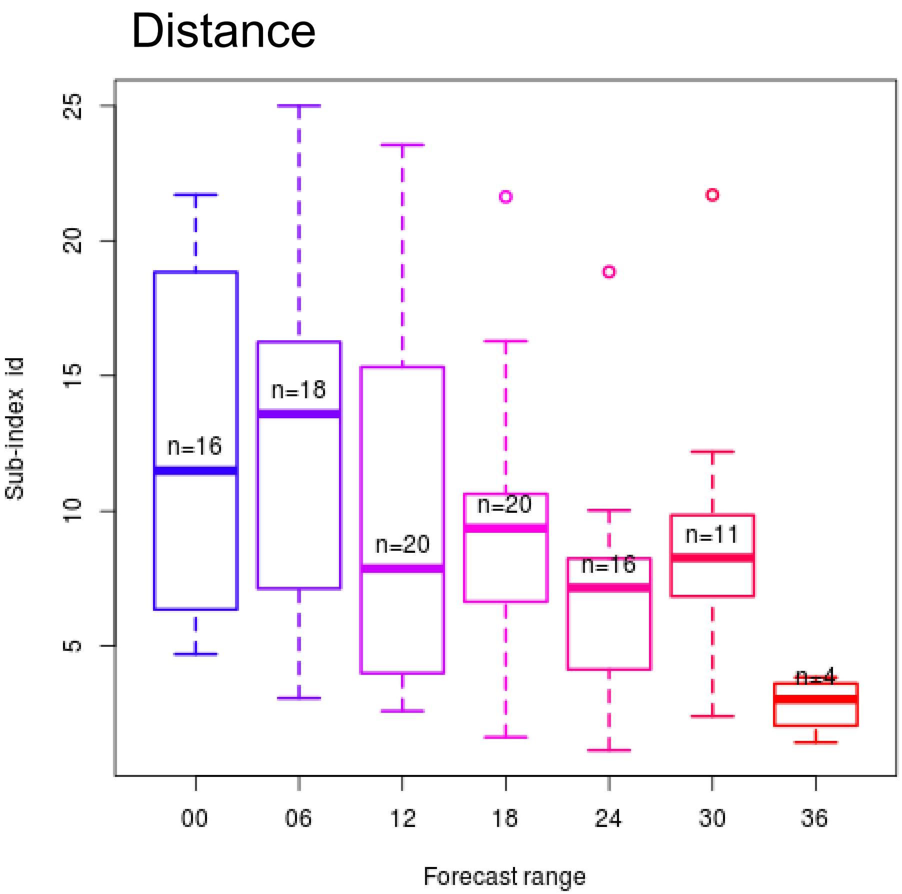
Run 201210 31 06

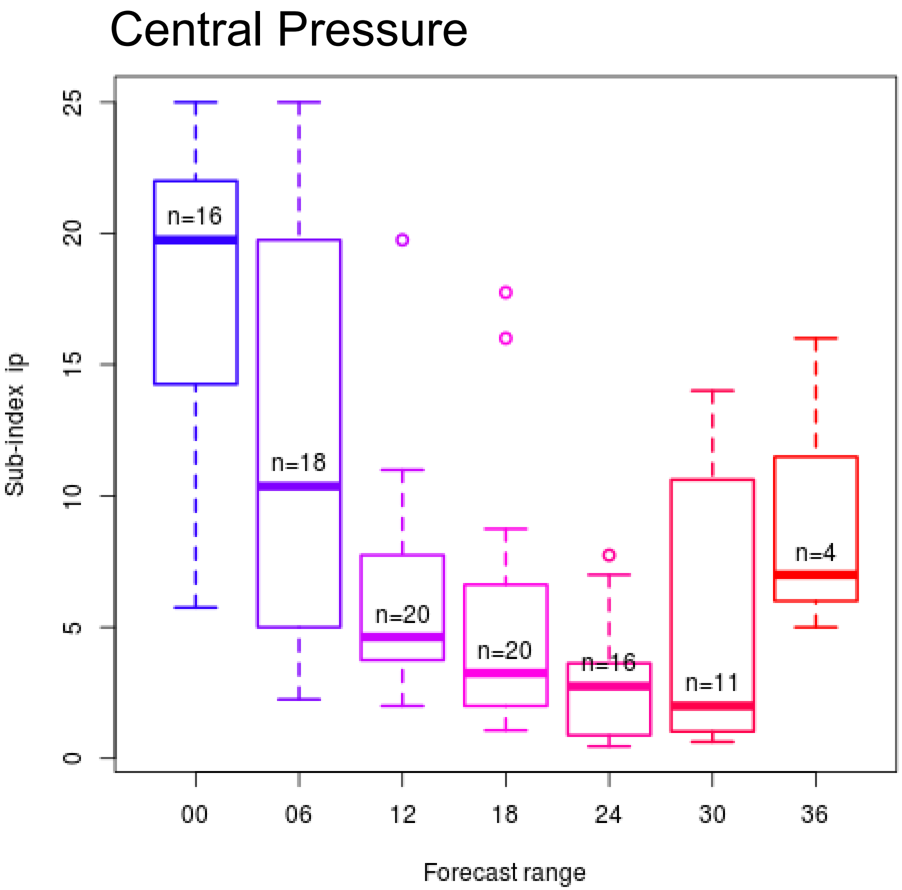


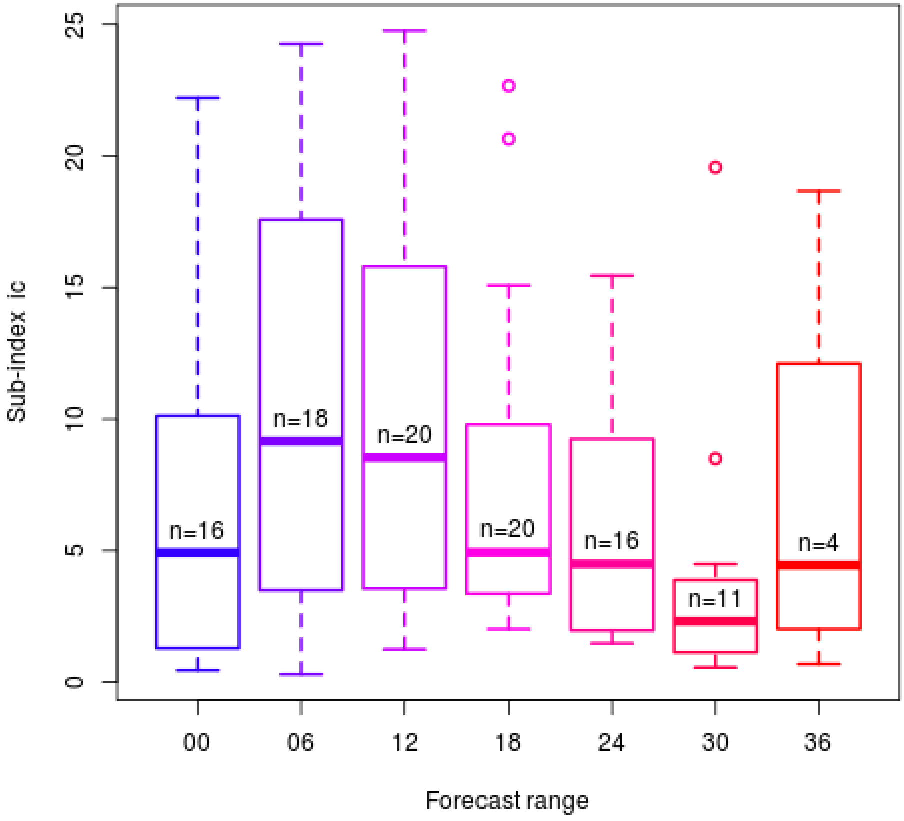
Central Pressure



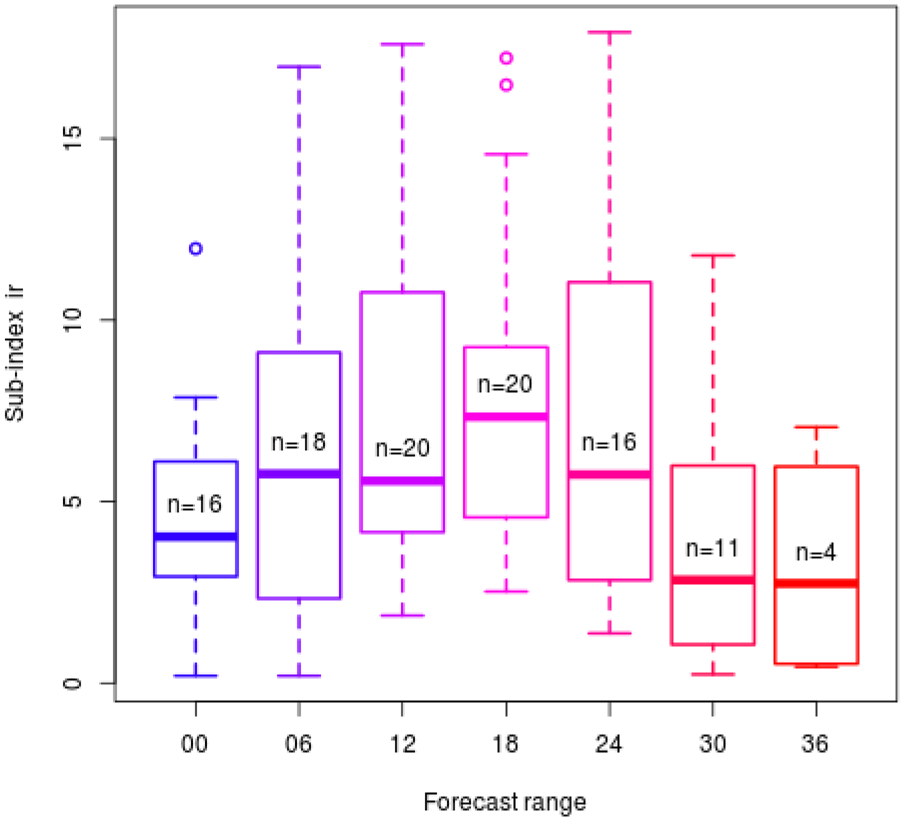

Total Index I
Index I
Forecast range
10
20
30
40
50
00
06
12
18
24
30
36
n=16
n=18
n=20
n=20
n=16
n=11
n=4


Distance
Sub-index id
25
20
15
10
5
n=16
n=18
n=20
n=20
n=16
n=11
n=4
00
06
12
18
24
30
36
Forecast range

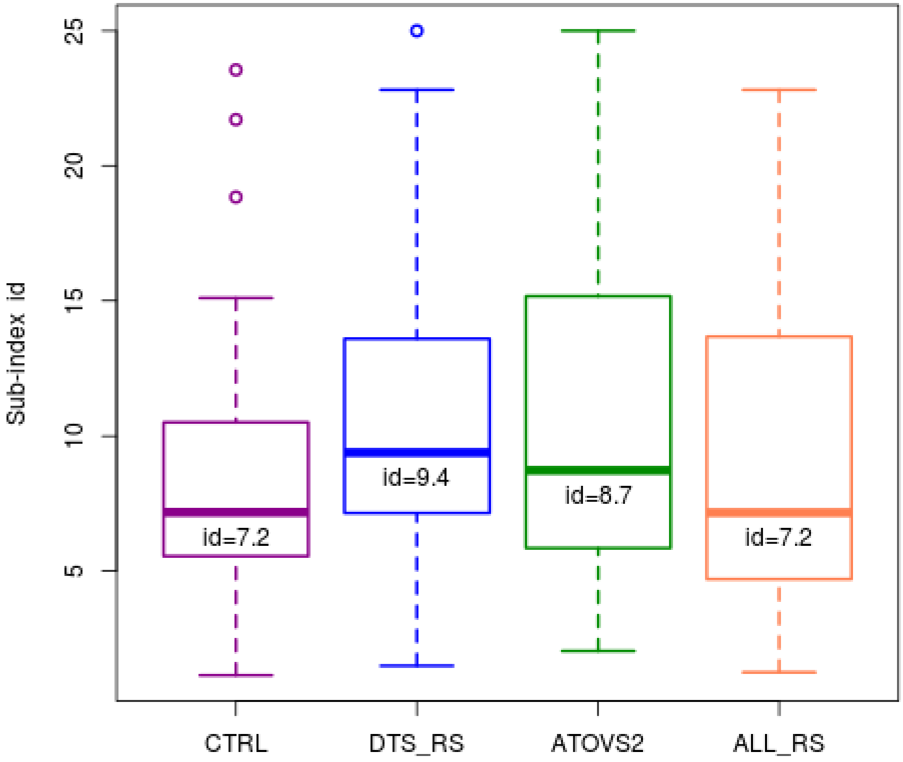

Central Pressure
Sub-index ip
25
20
15
10
5
0
n=16
n=18
n=20
n=20
n=16
n=11
n=4
00
06
12
18
24
30
36
Forecast range



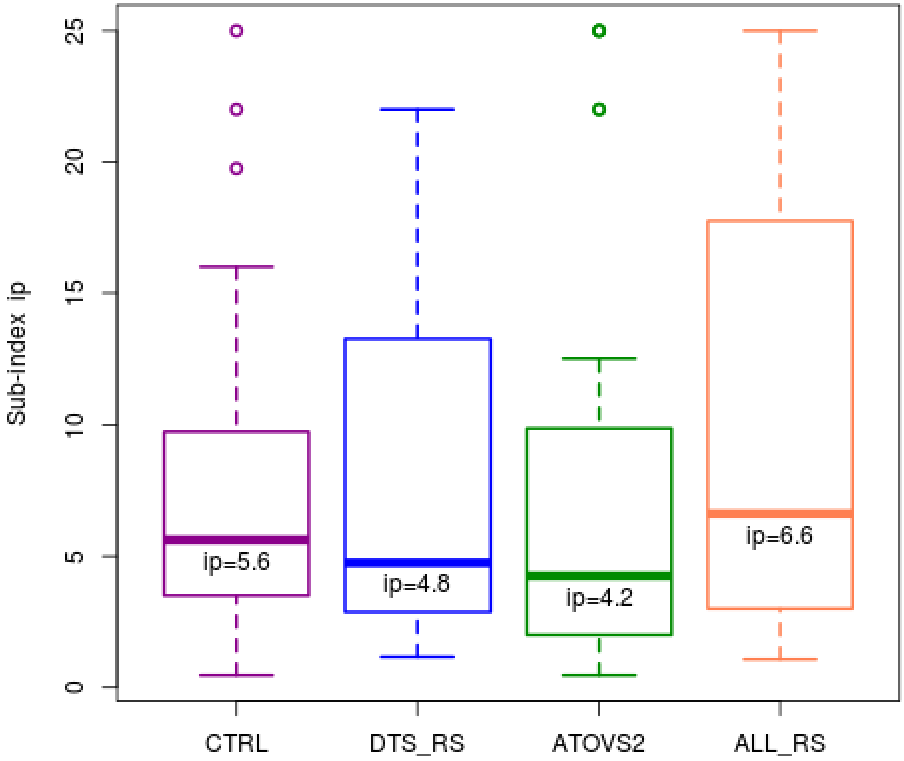
G Circulation



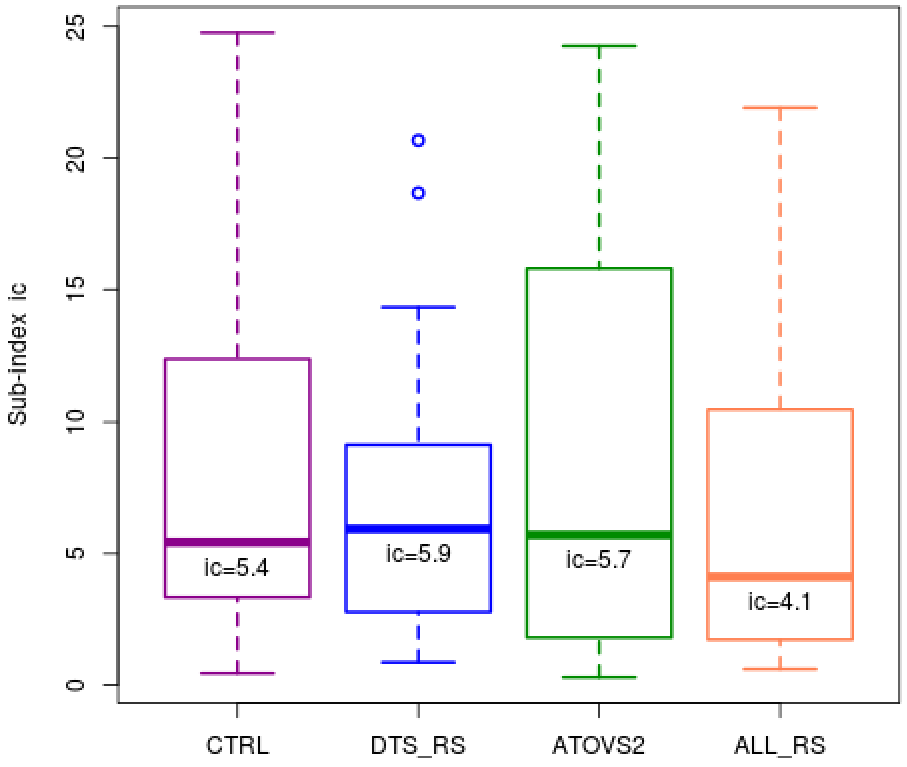
Correlation radii



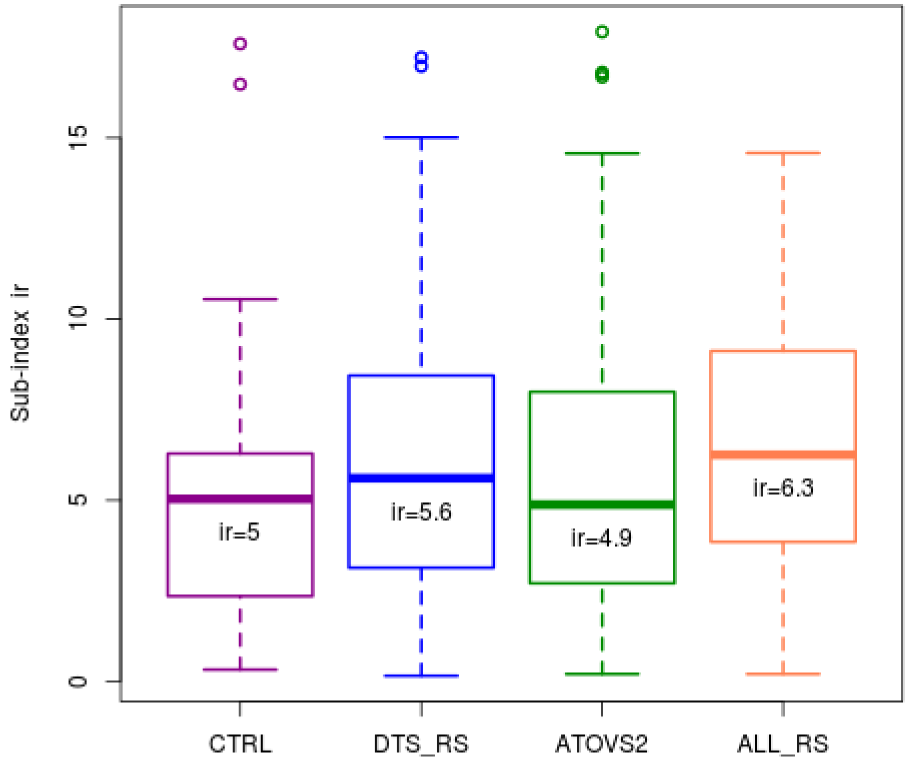
Distance



Central Pressure

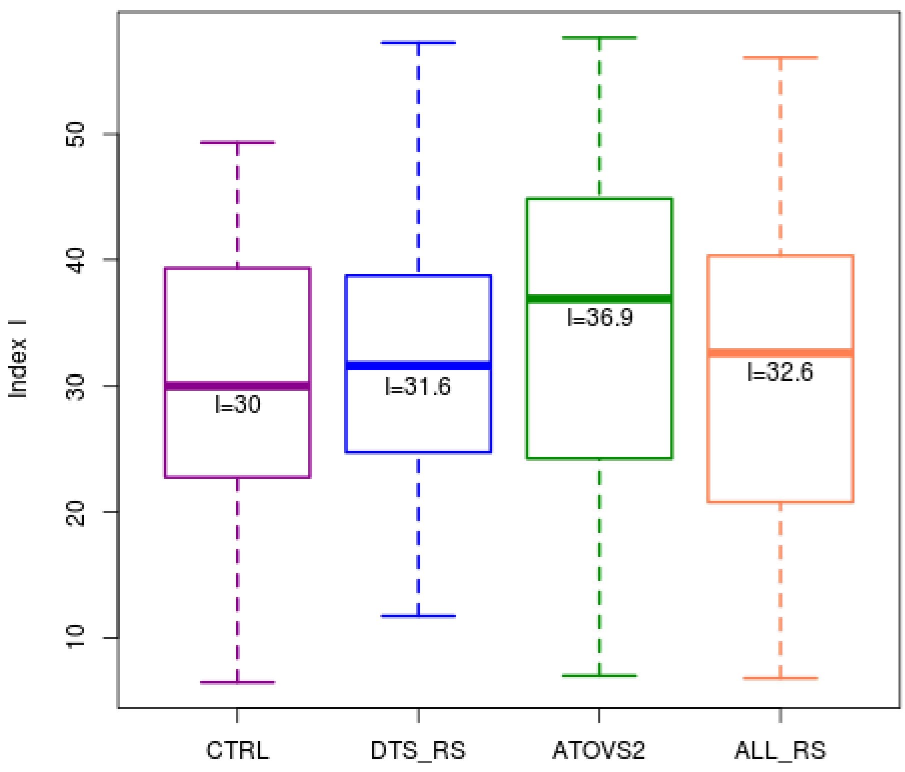


G Circulation

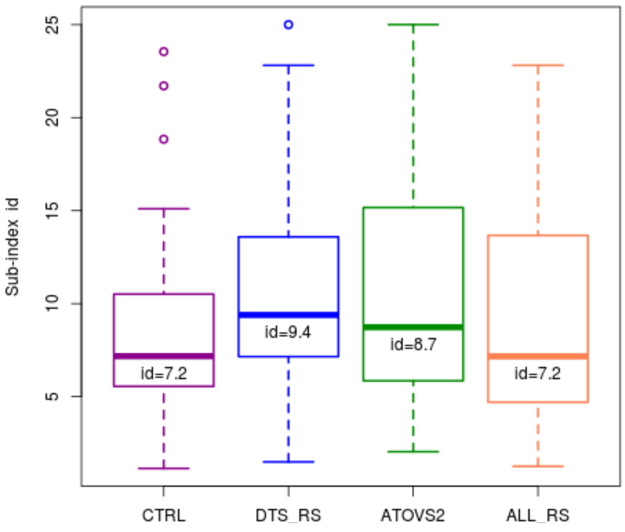


Domain

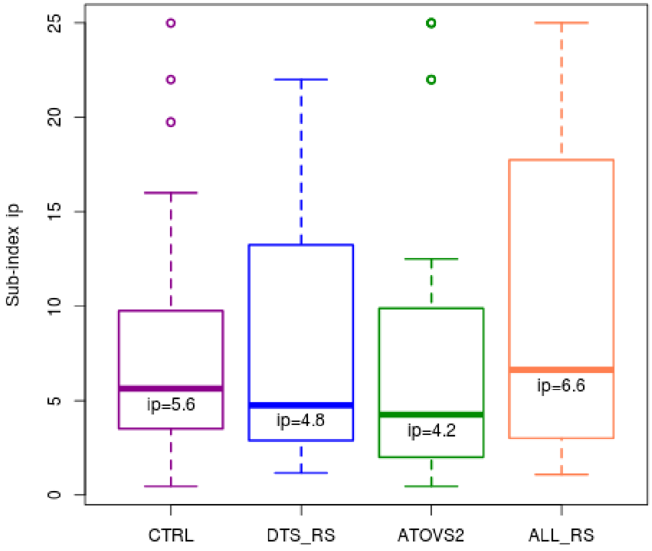
Total Index I



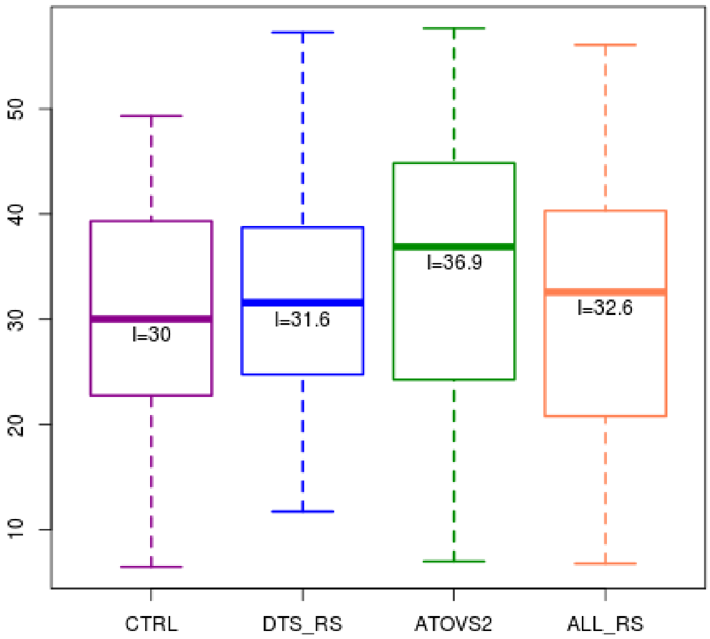
Distance



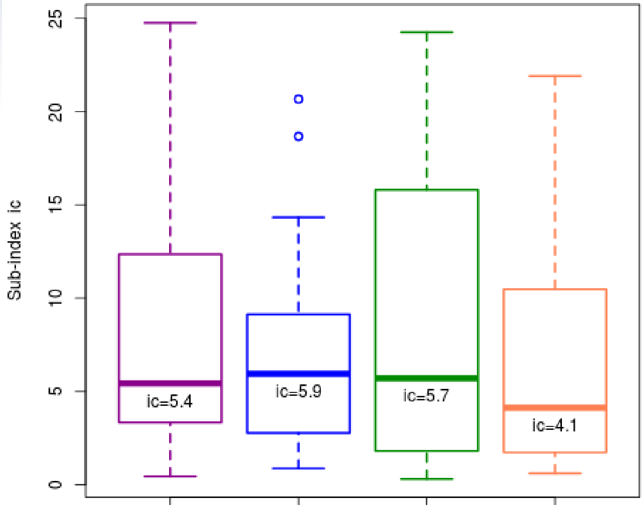
Central Pressure



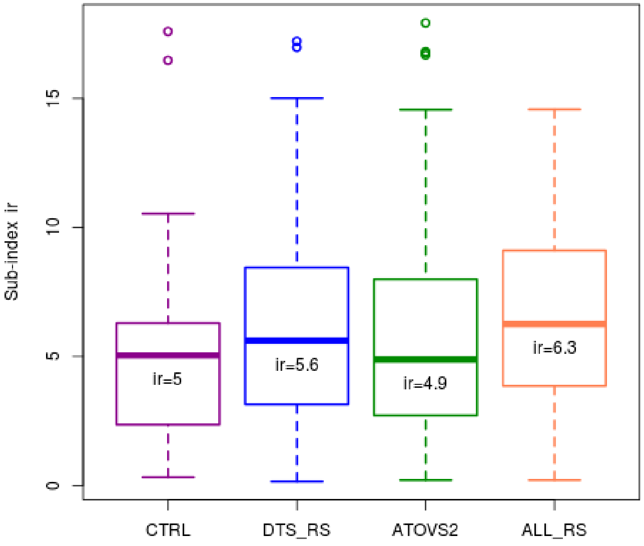
Total

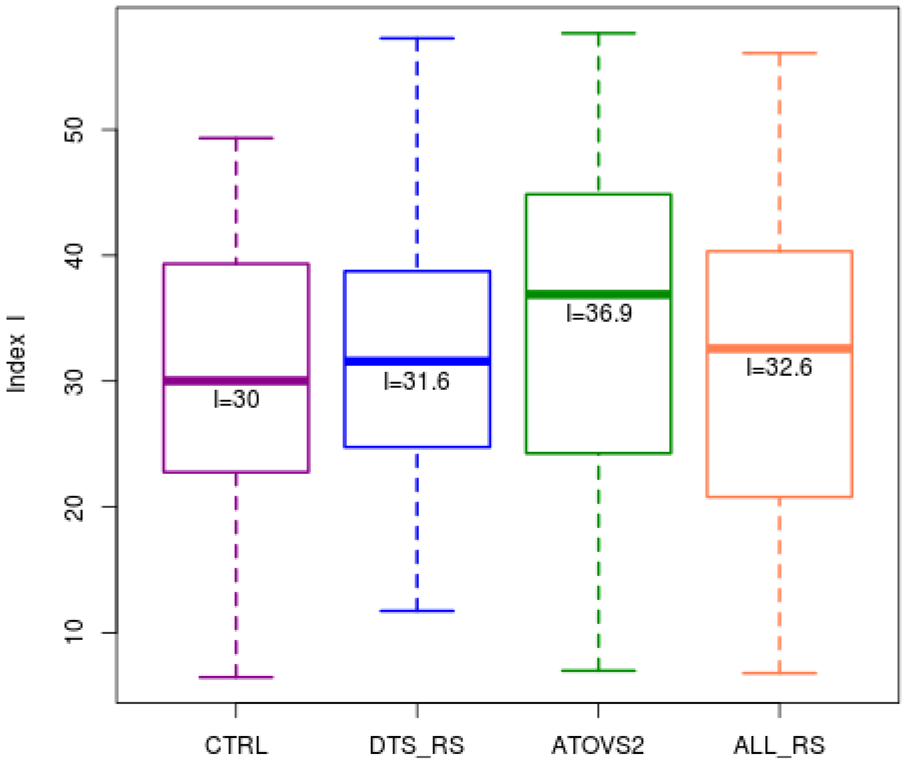
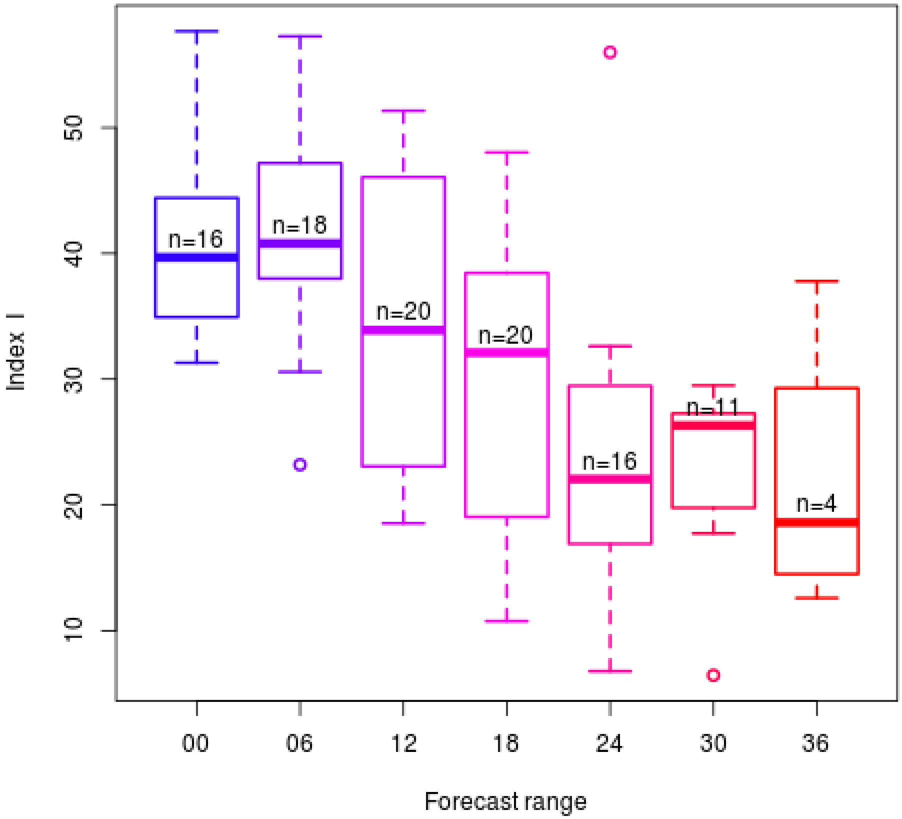


G Circulation



Domain



VERIFICACIÓN DE LA PREDICCIÓN DE CICLONES DURANTE LA CAMPAÑA HYMEX