

MCS activity during SALLJEX and the relationship with SALLJ events



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Nicolini**

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CIMA – Dpto. Cs. de la**

Acknowledgments

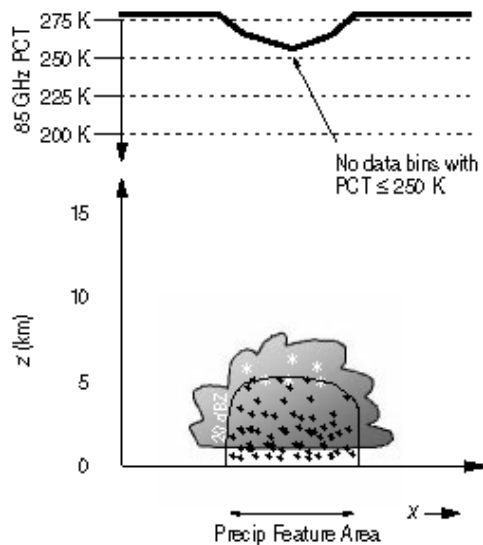
- Gilberto Vincente for IR database
- Chuntao Liu (U of Utah) for data processing help
- All SALLJEX participants for successful program
- Mike Patterson for support of the program and for supporting PS and MN visits to U of Utah

Outline of Talk

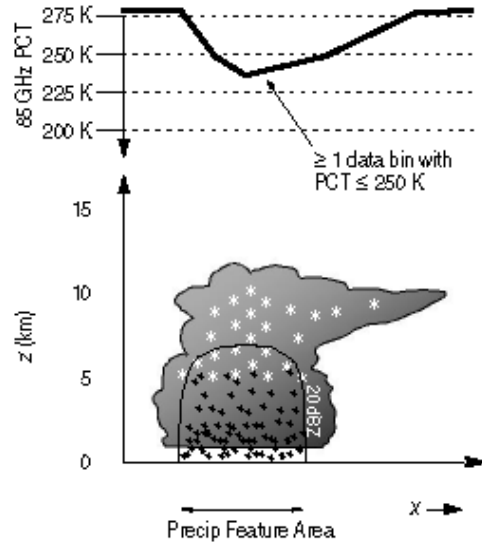
- Observed properties of MCSs using IR data at 30-minute intervals. Duration, size, diurnal cycle.
- A few case studies of Chaco events during SALLJEX. *Preliminary stage.*
- Composite of 11 cases of MCSs reaching maximum extent between 03-09 UTC and between 21-27°S. What is relationship with SALLJ?

Definition of MCS from 85 GHz data - Requires large area with ice scattering

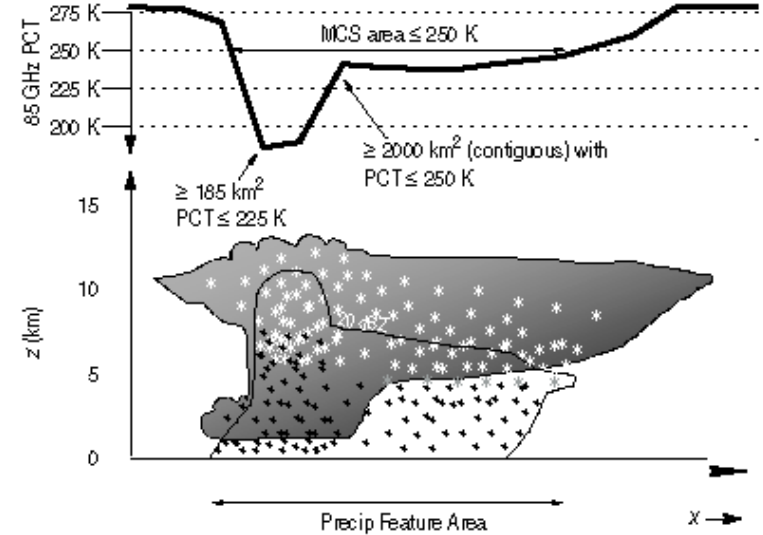
Precipitation Feature "without ice scattering"



Precipitation Feature "with ice scattering"

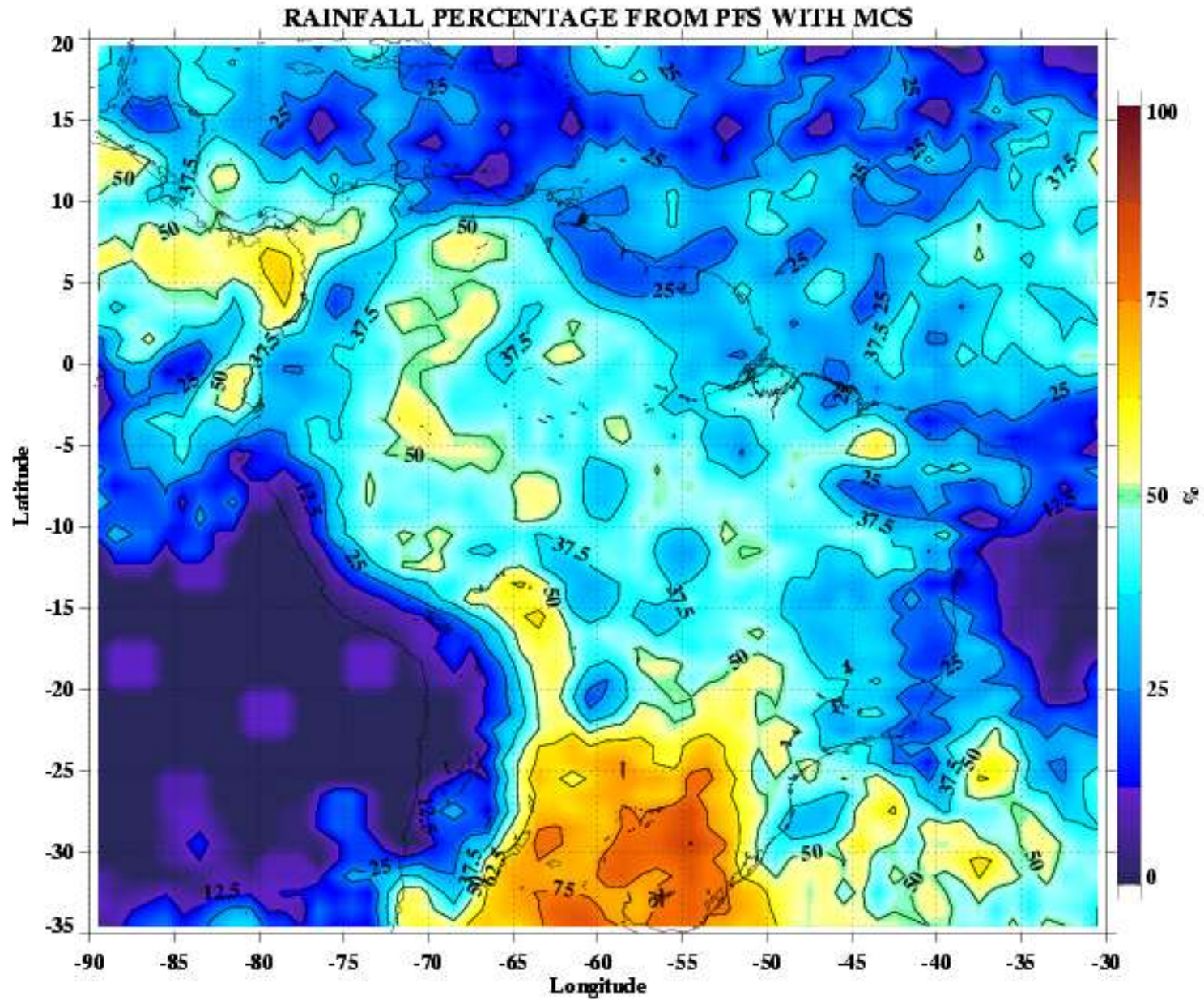


Precipitation Feature with a Mesoscale Convective System

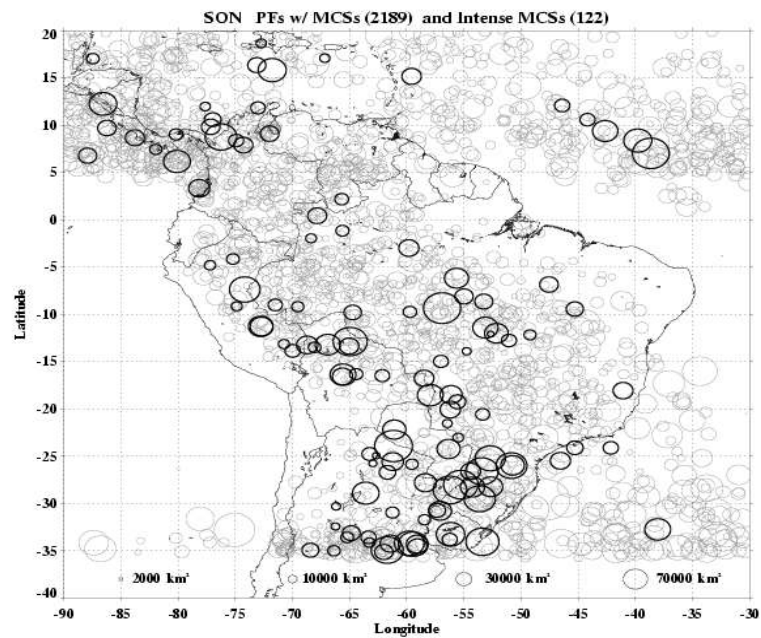
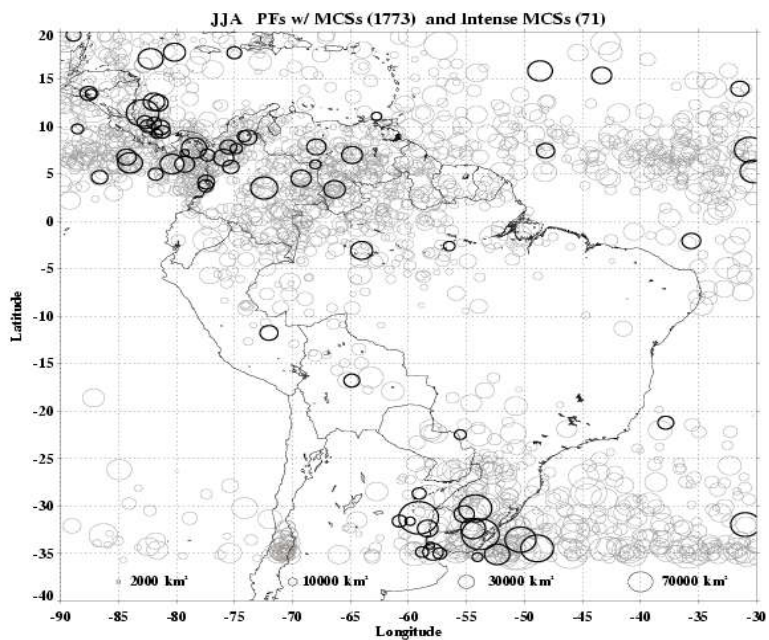
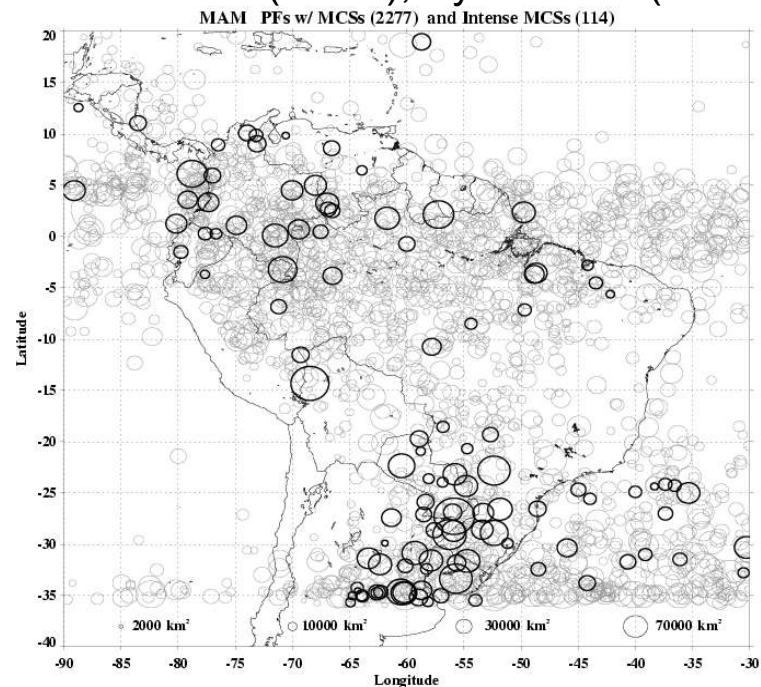
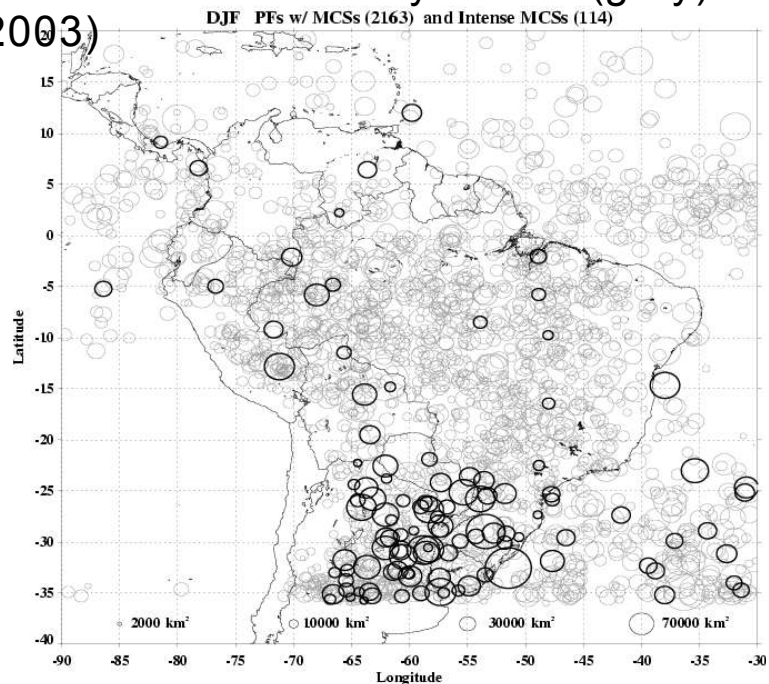


After Mohr and Zipser (MWR 1996),
Nesbitt et al. (JCLIM 2000)

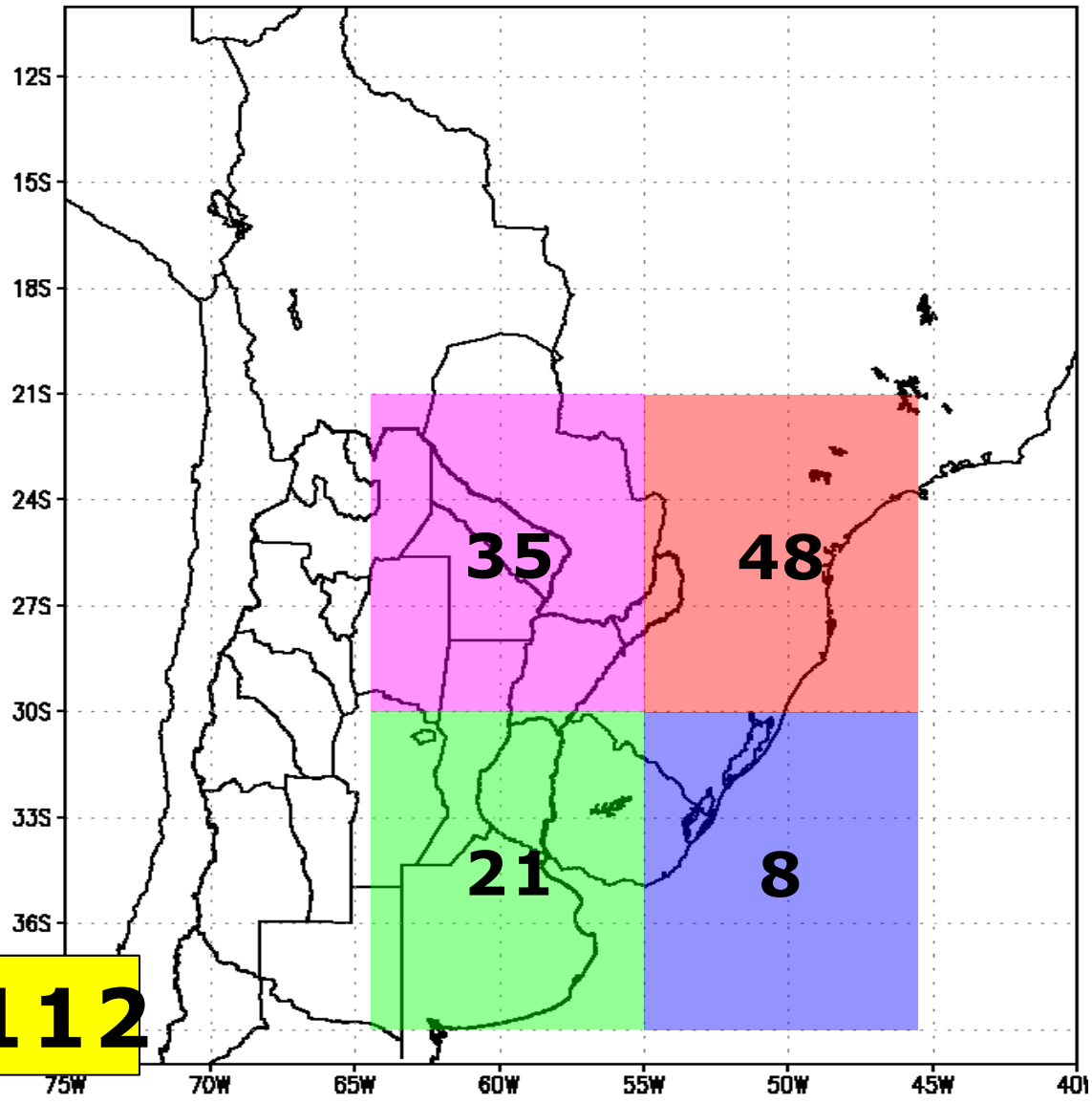
Subtropical South America has **large** fraction of its rainfall from MCSs (Mota 2003)



Distribution of 'ordinary' MCSs (gray) and INTENSE MCSs (black), by season (Mota 2003)

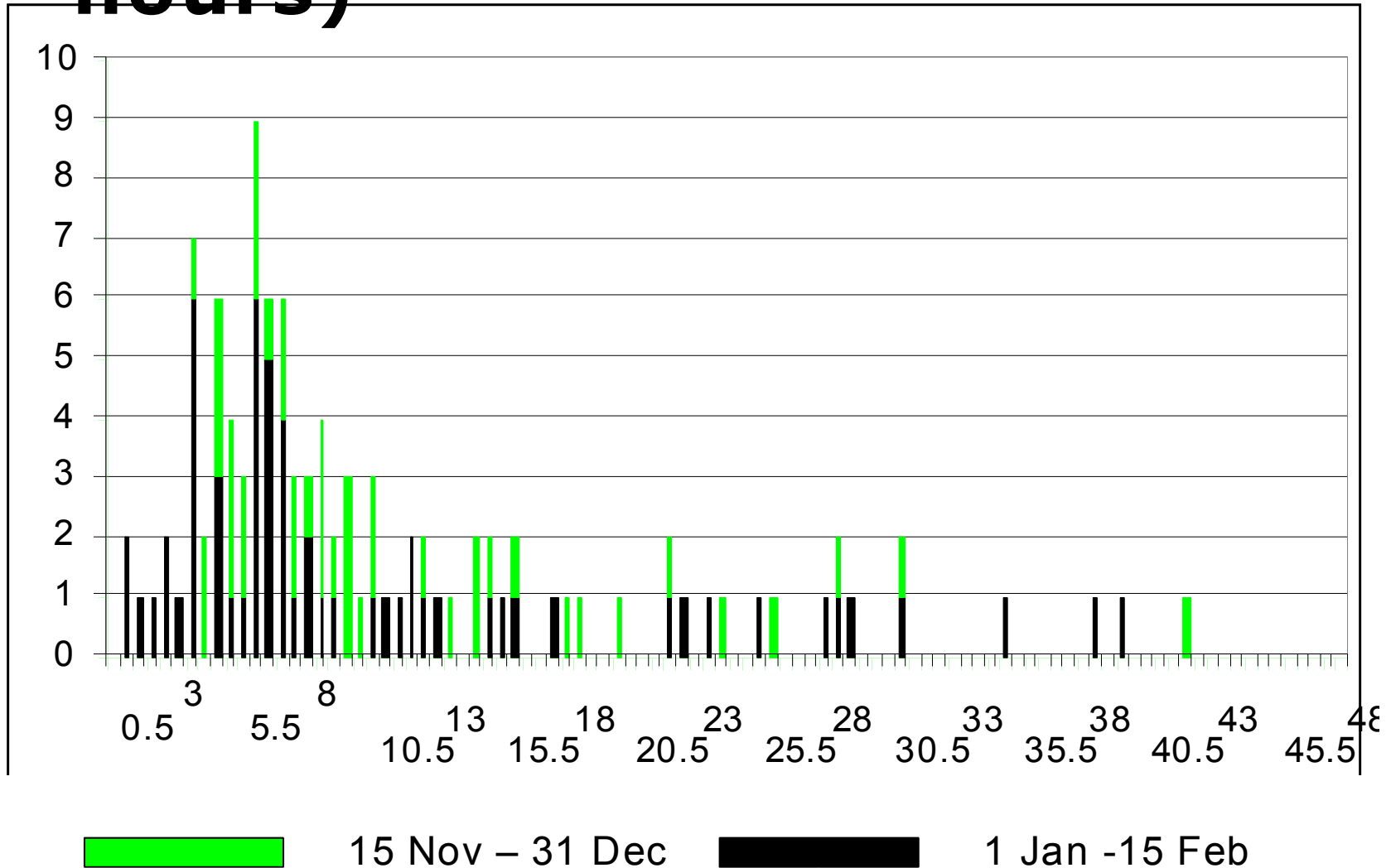


Number of MCSs during SALLJEX



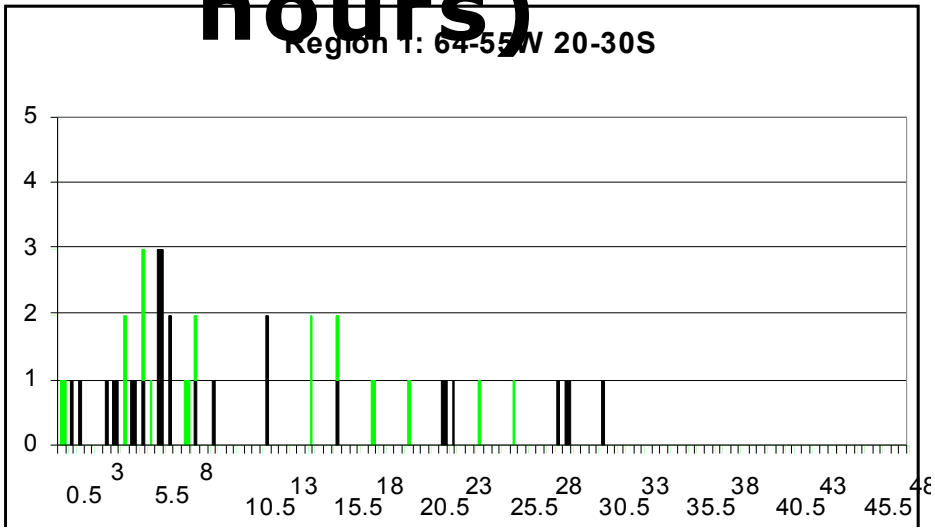
Total 112

MCS duration (lifetime, hours)

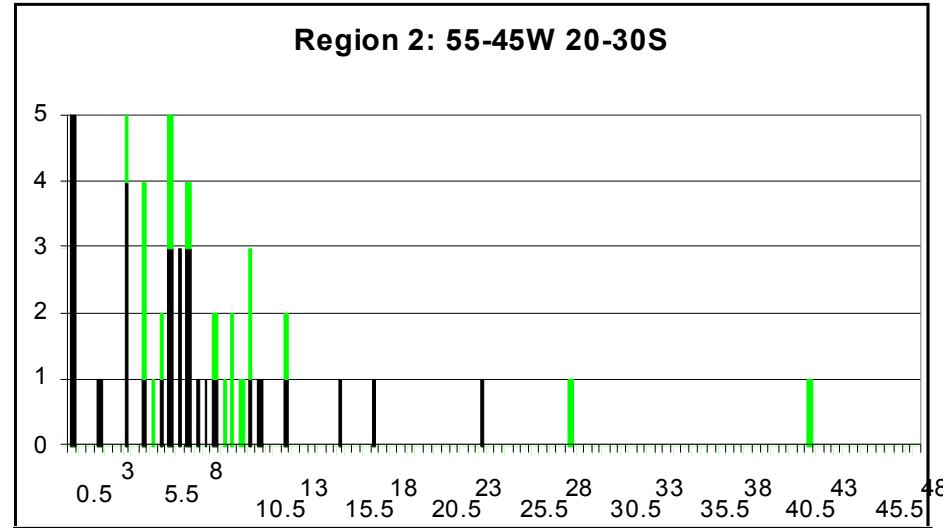


MCS duration (lifetime, hours)

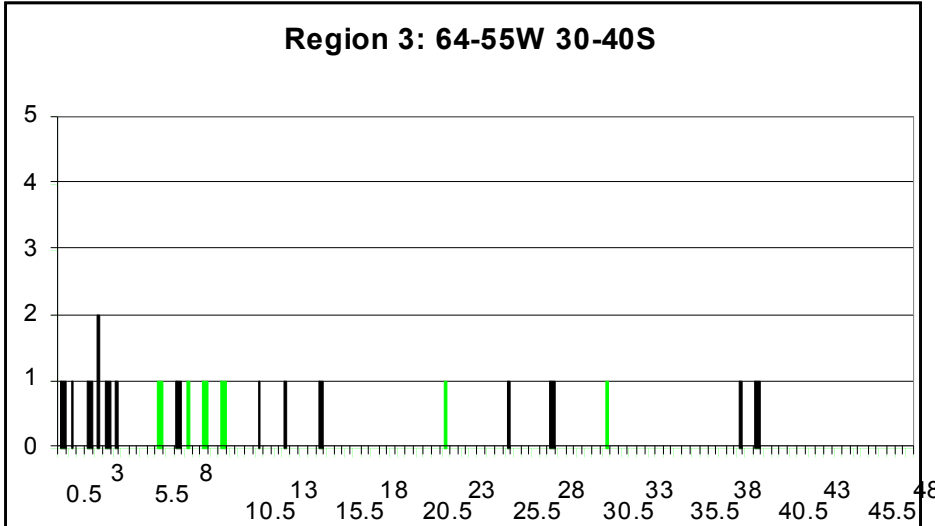
Region 1: 64-55W 20-30S



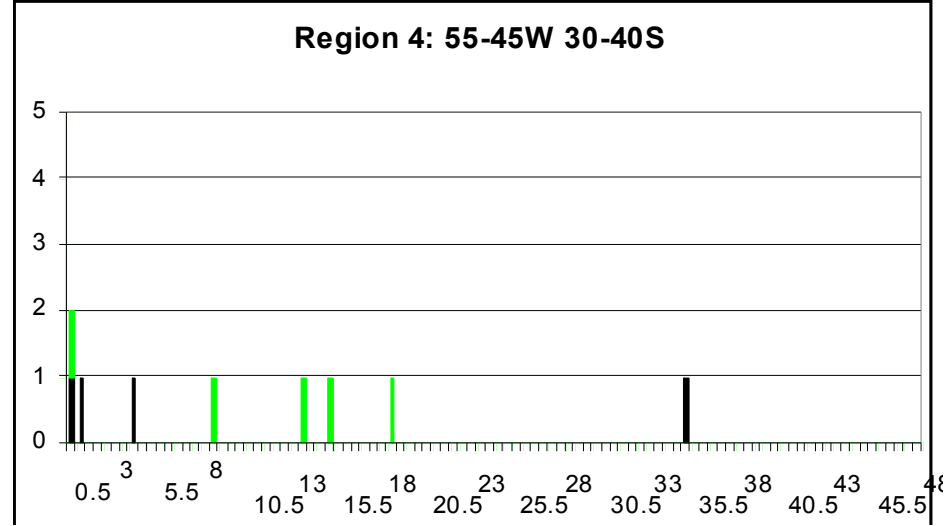
Region 2: 55-45W 20-30S



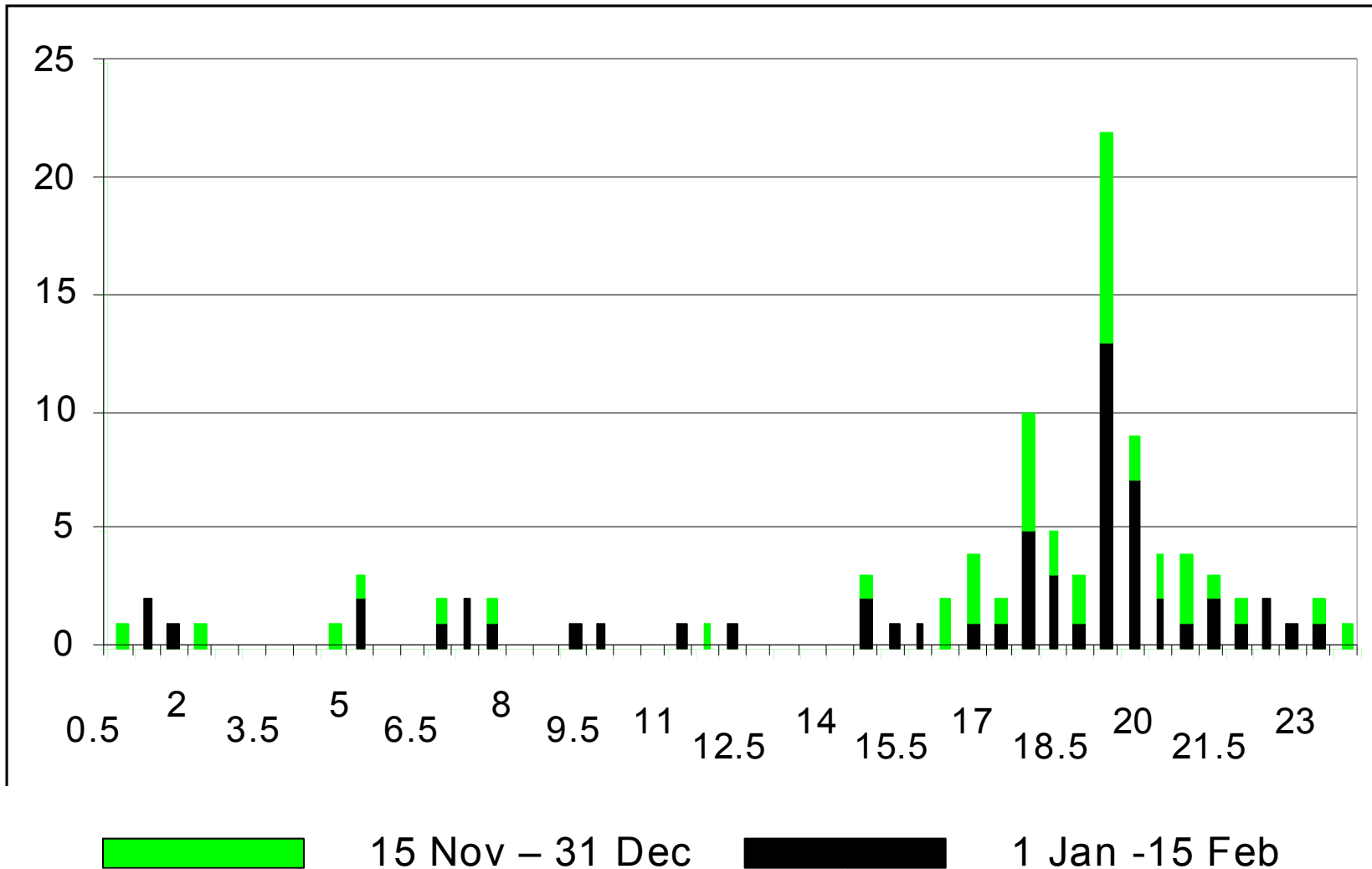
Region 3: 64-55W 30-40S



Region 4: 55-45W 30-40S

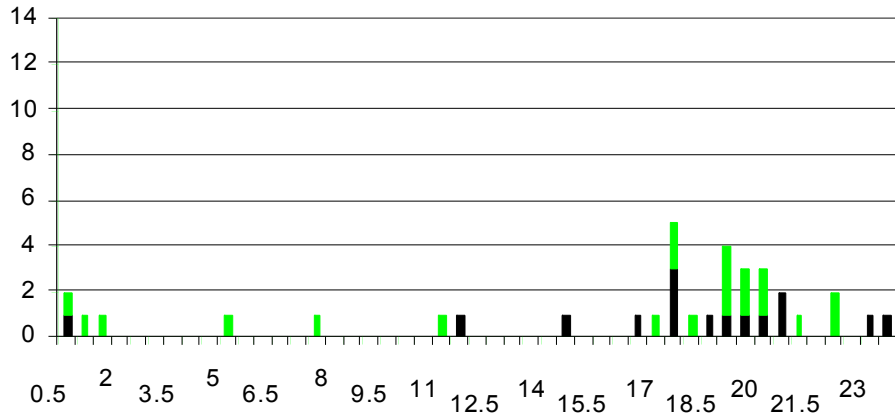


Initiation time in UTC

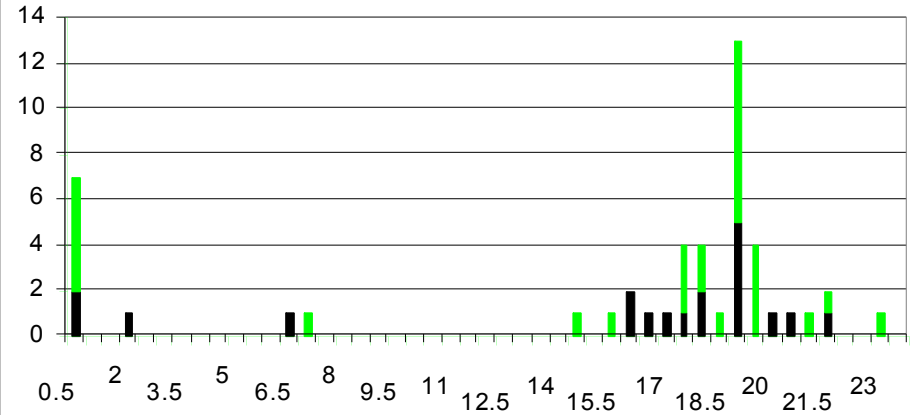


Initiation time in UTC

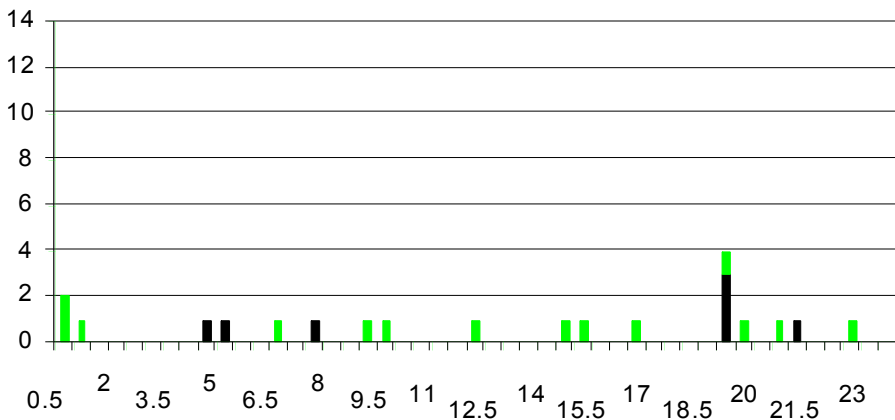
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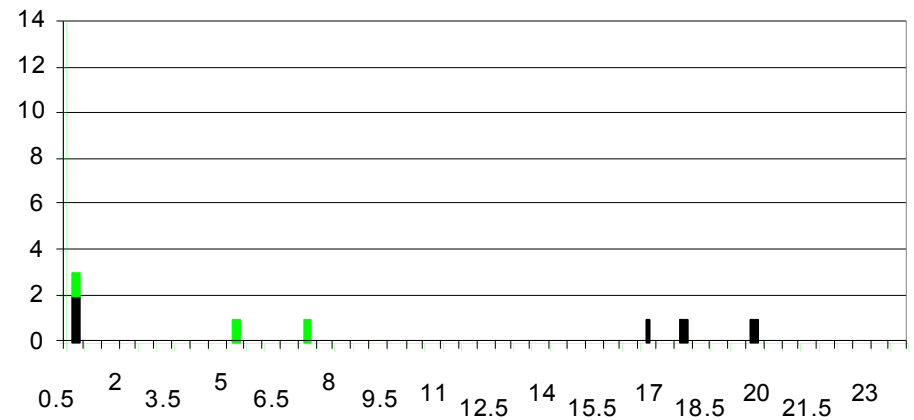
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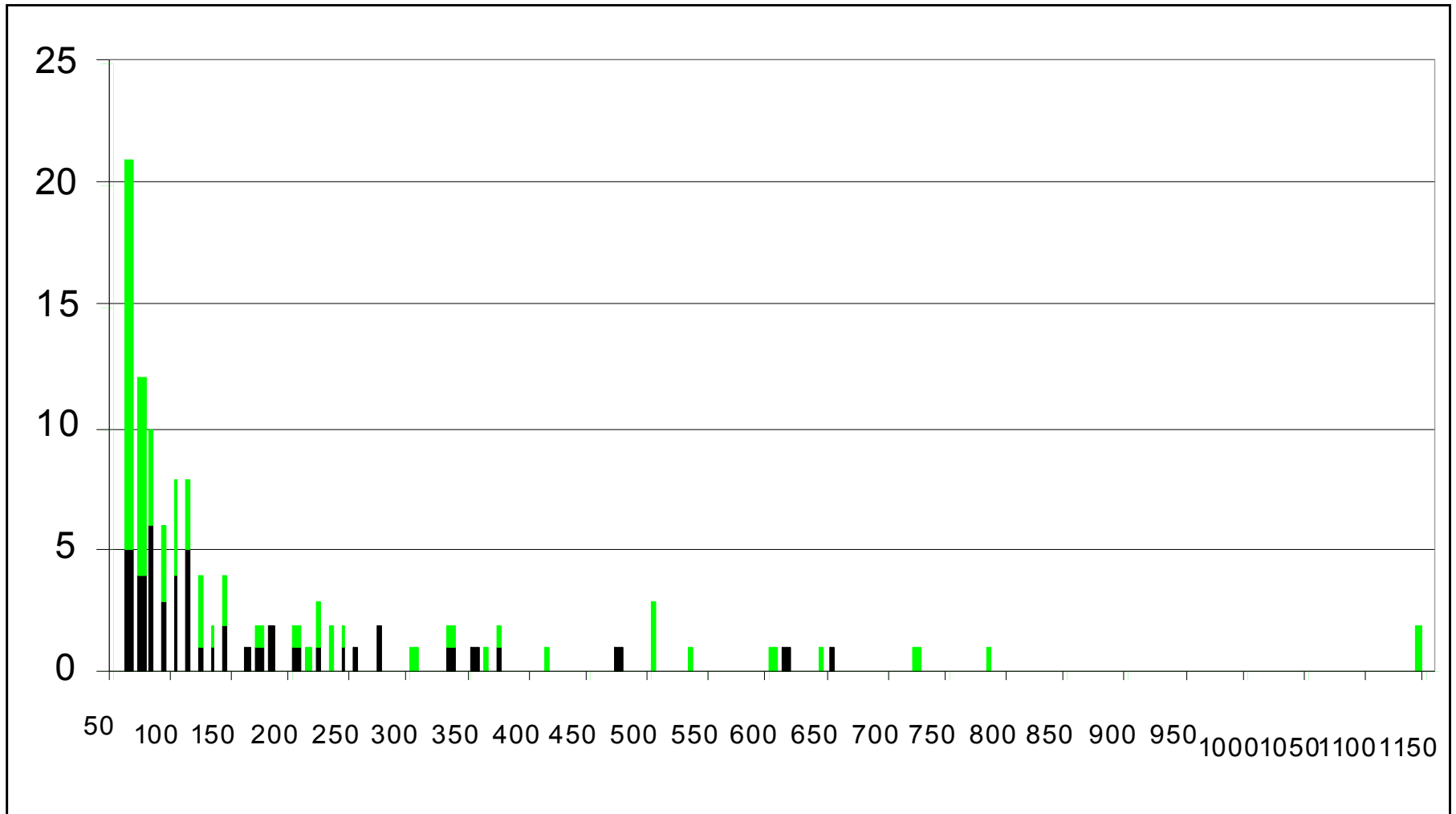
Region 3: 65-55W 30-40S



Region 4: 55-45W 30-40S



Maximum extent (x 1000 km²)



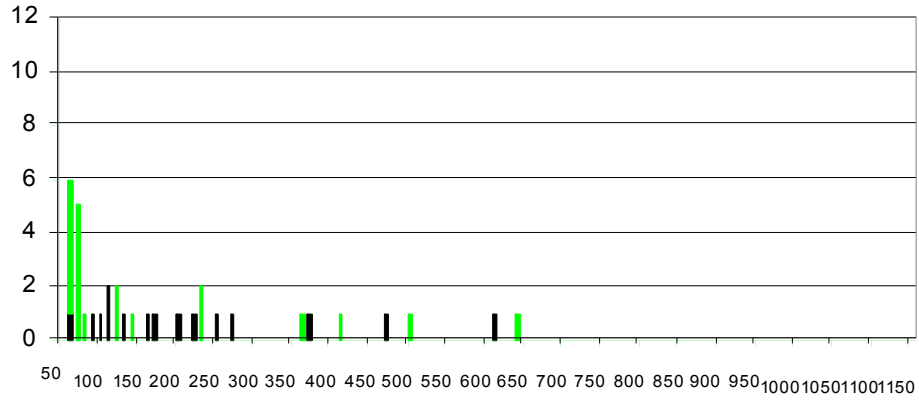
15 Nov - 31 Dec



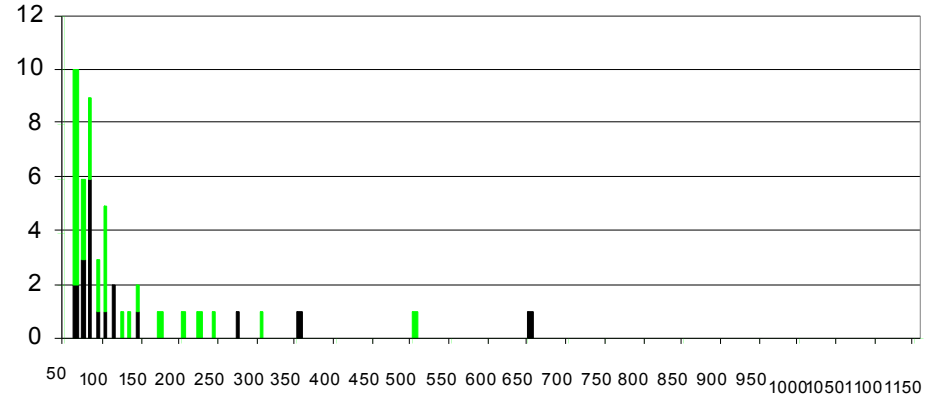
1 Jan - 15 Feb

Maximum extent (x 1000 km²)

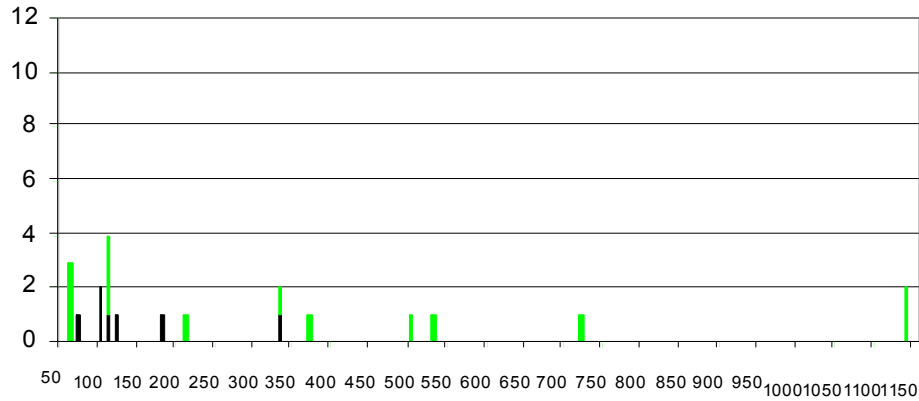
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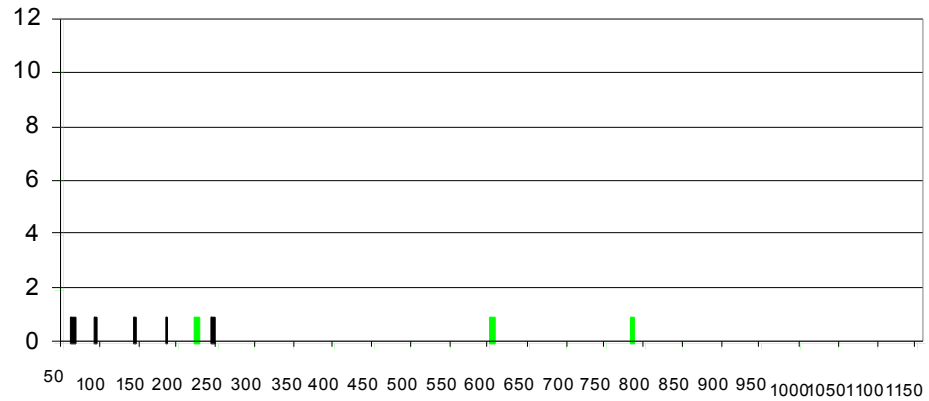
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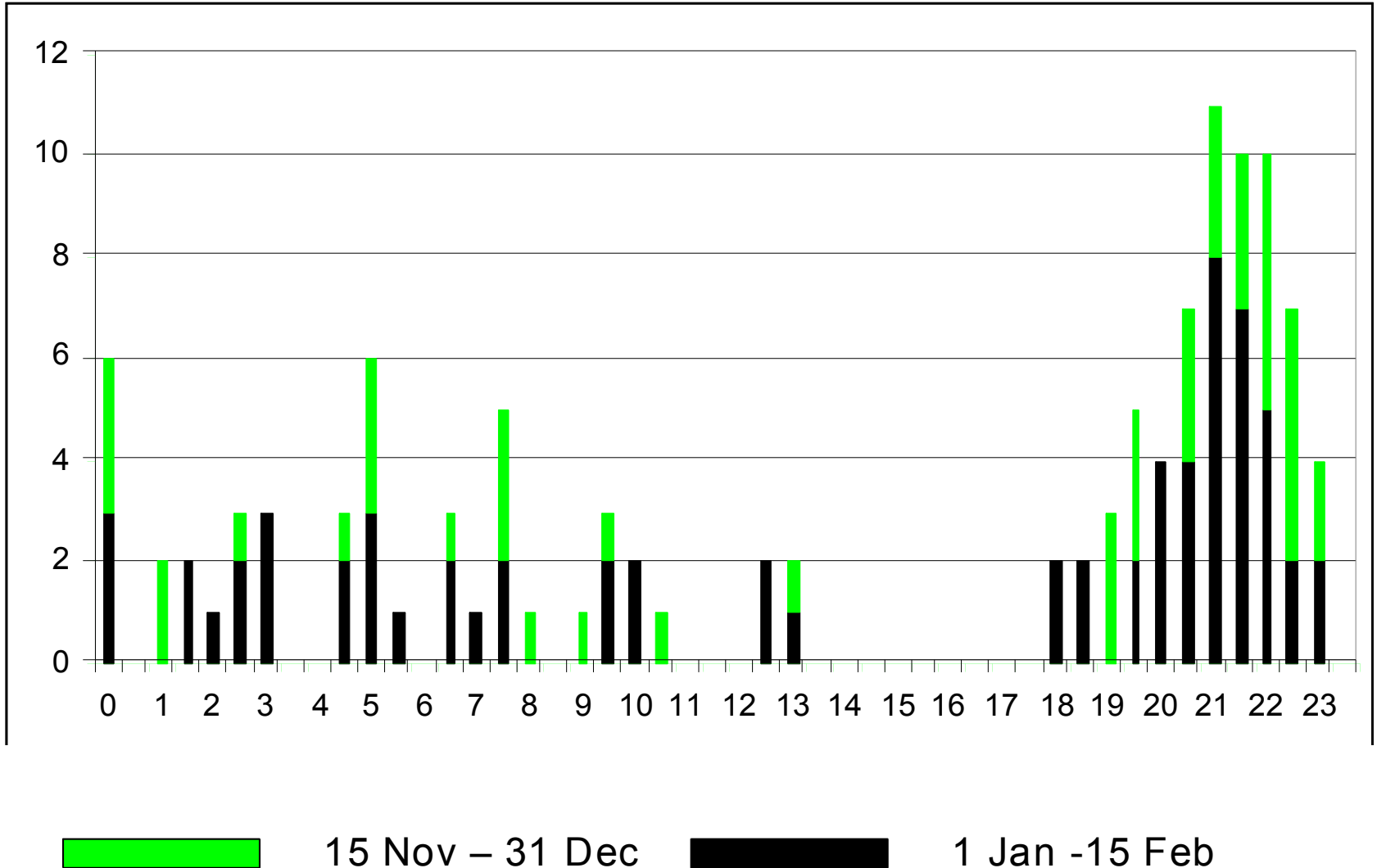
Region 3:64-55W 30-40S



Region 4:55-45W 30-40S

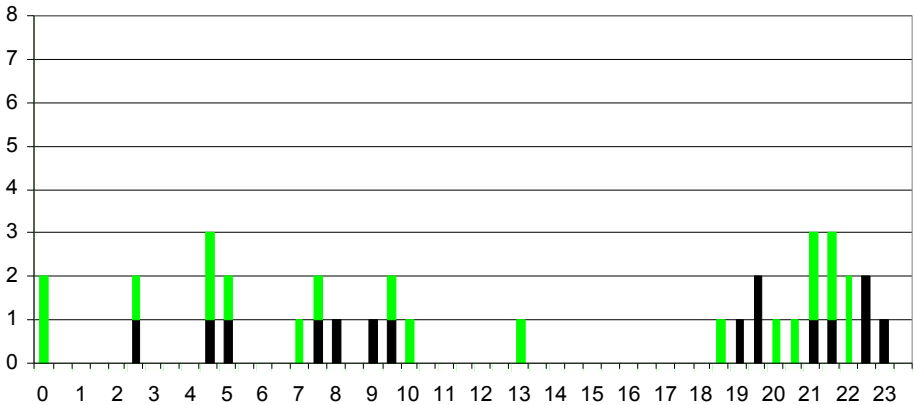


Maximum extent time

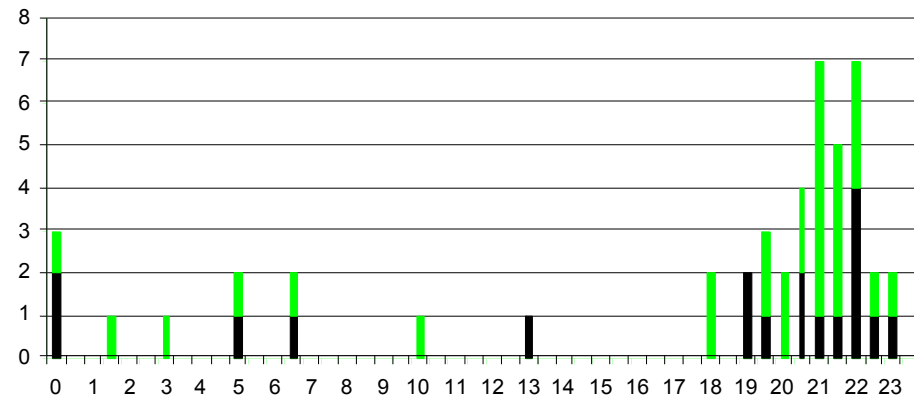


Maximum extent time

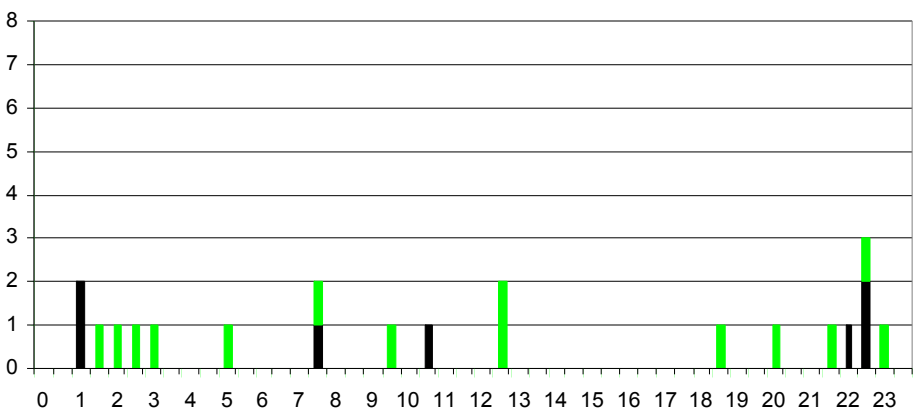
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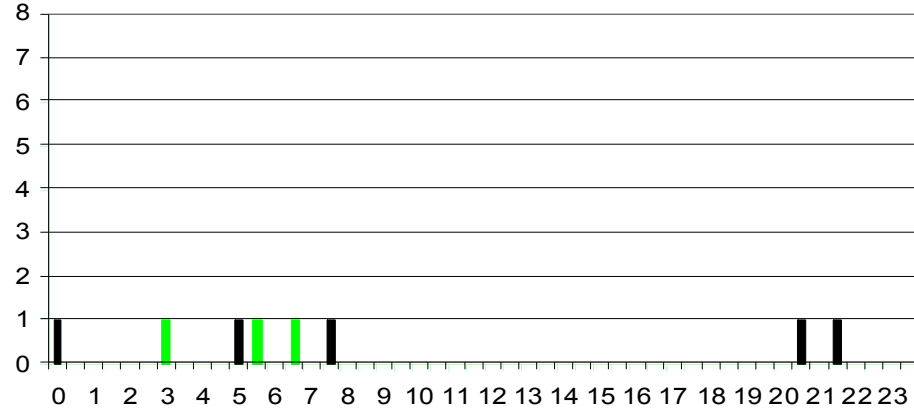
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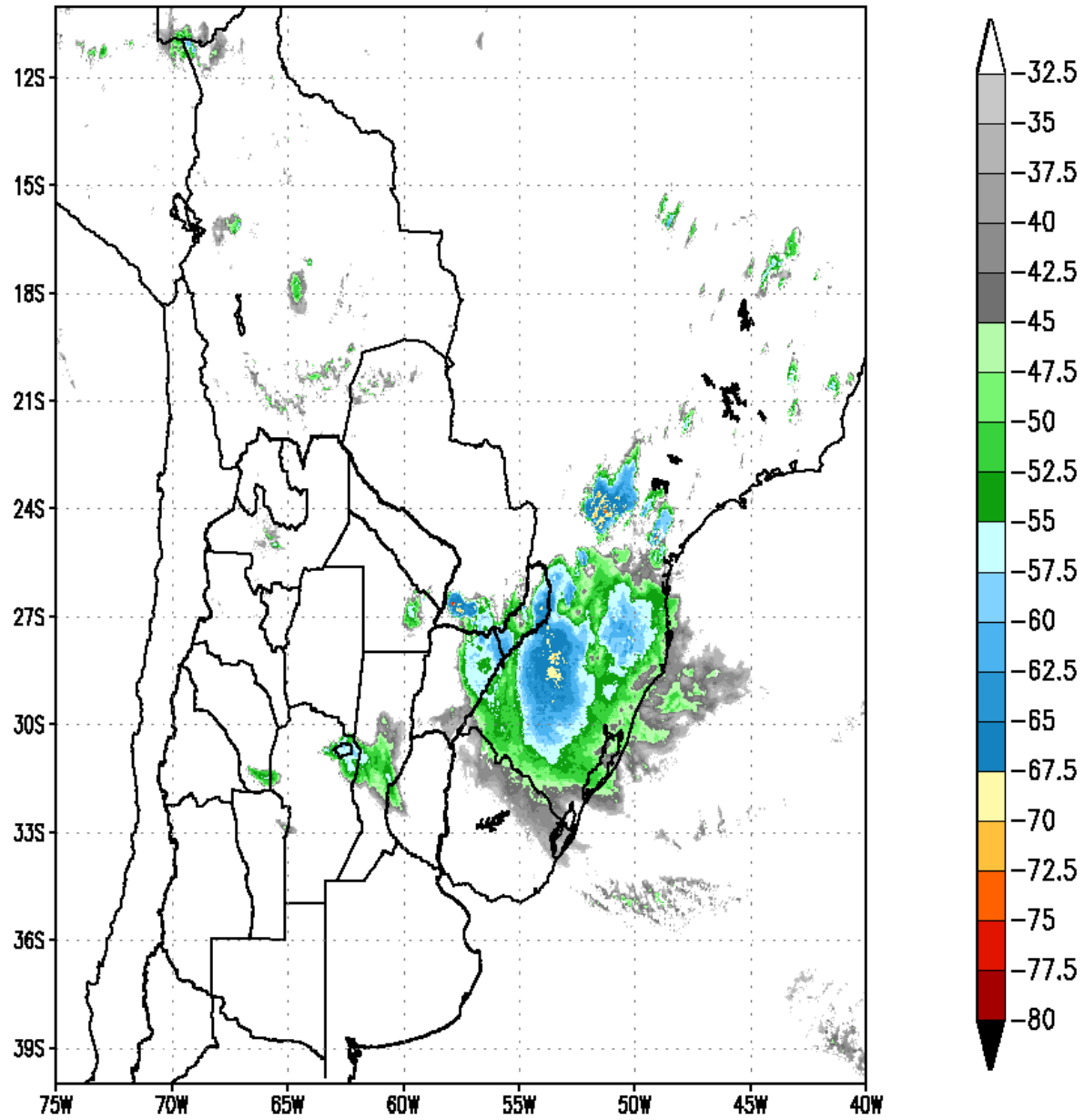
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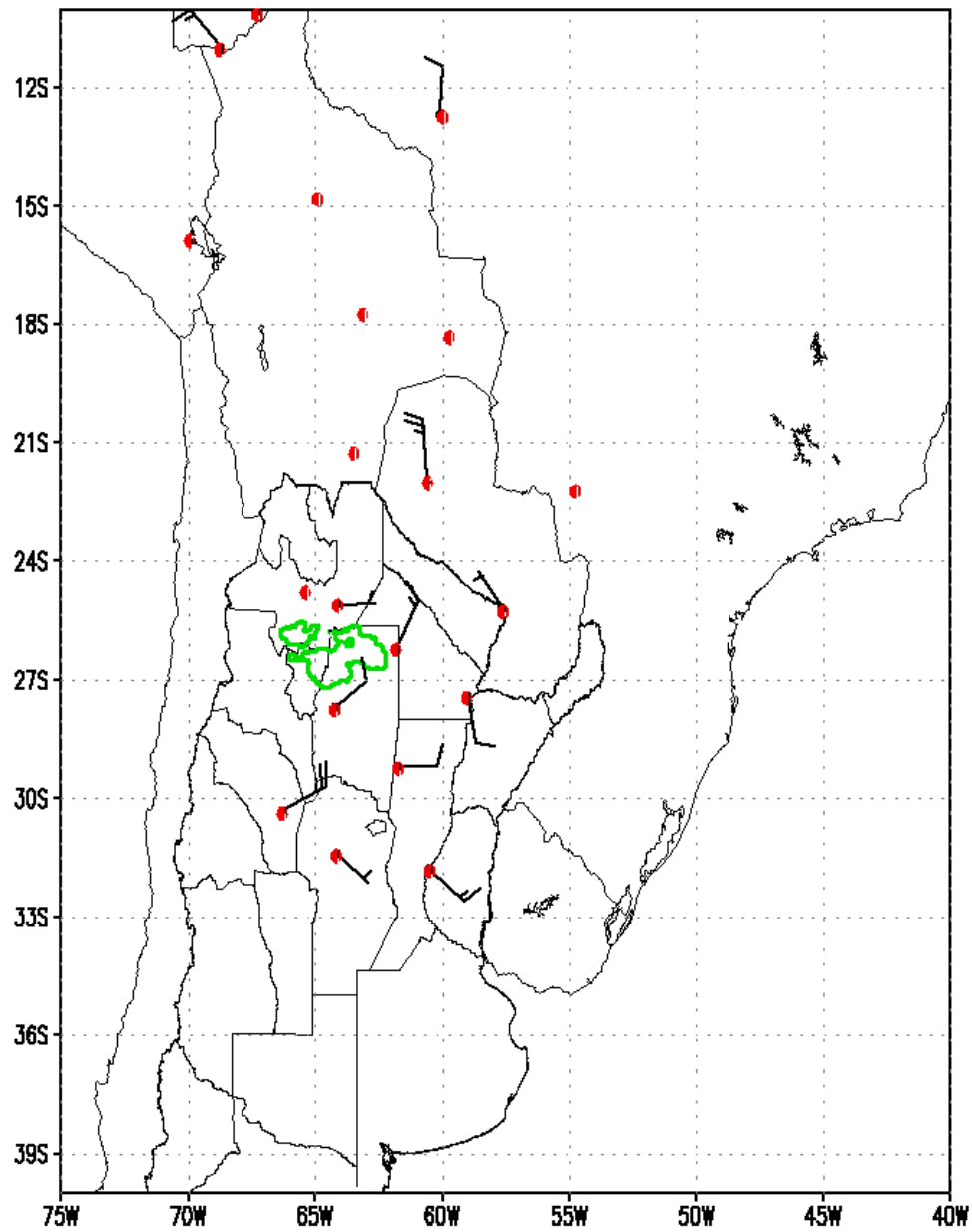
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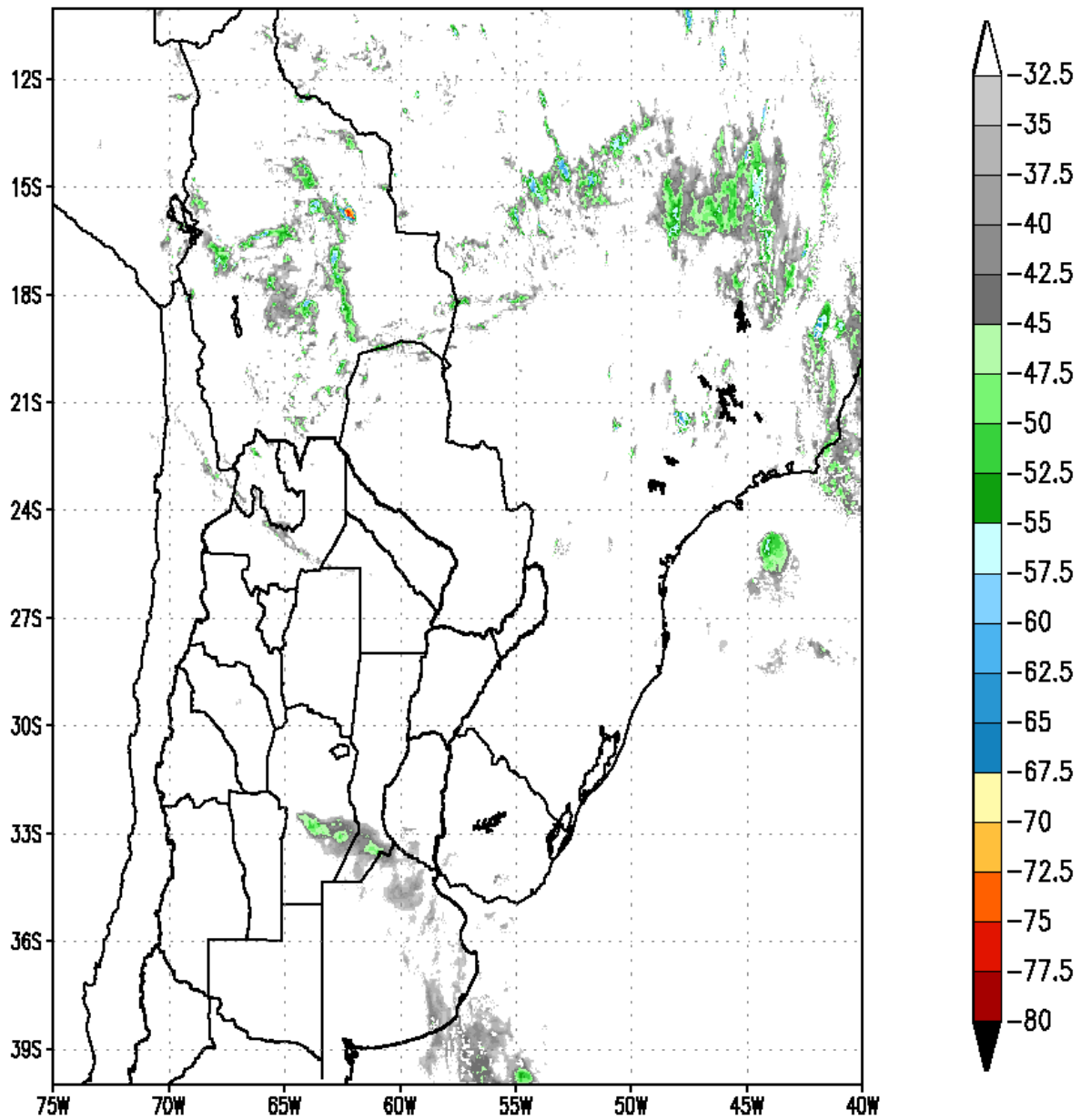
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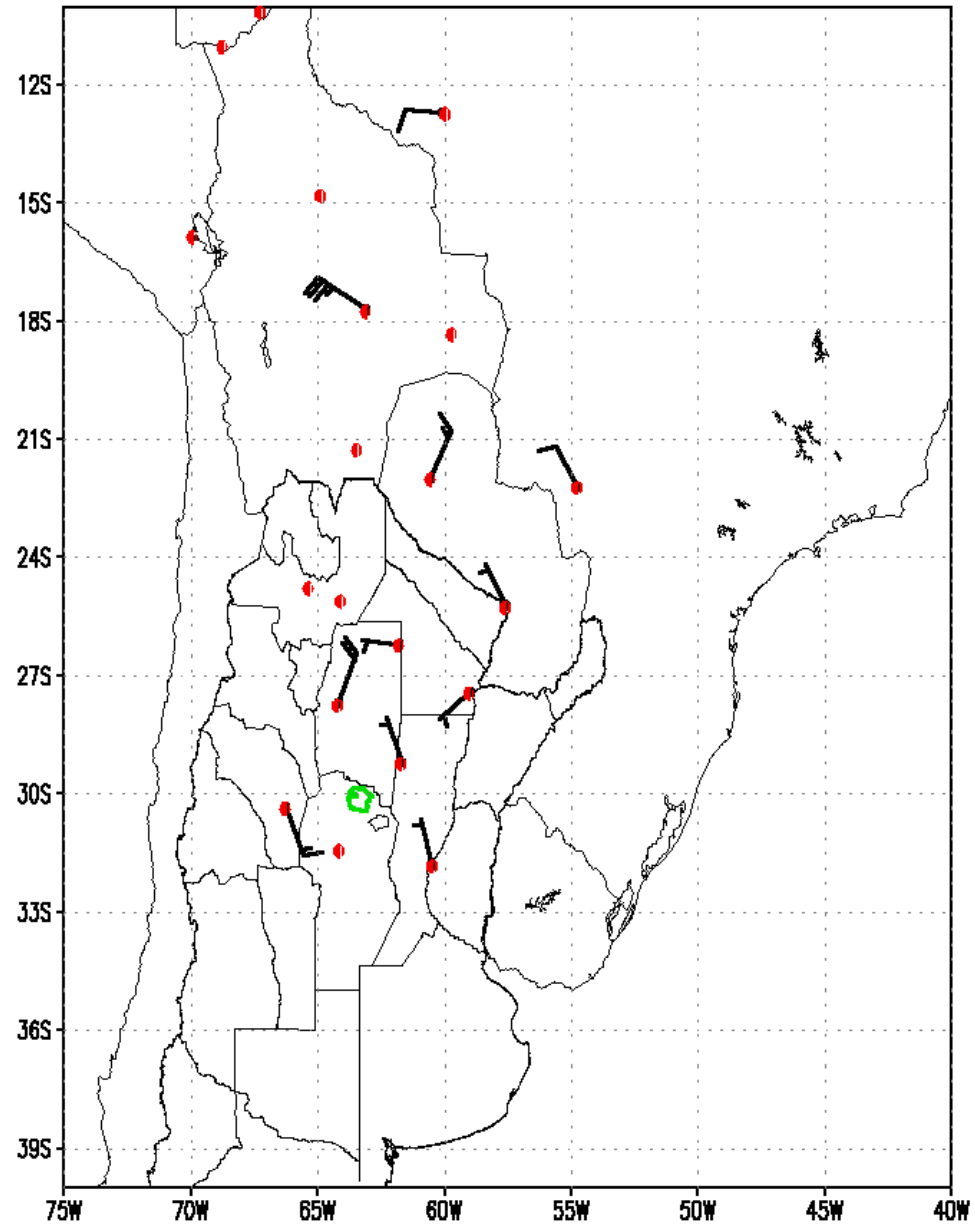
2003 01 10 21 1500 ASL



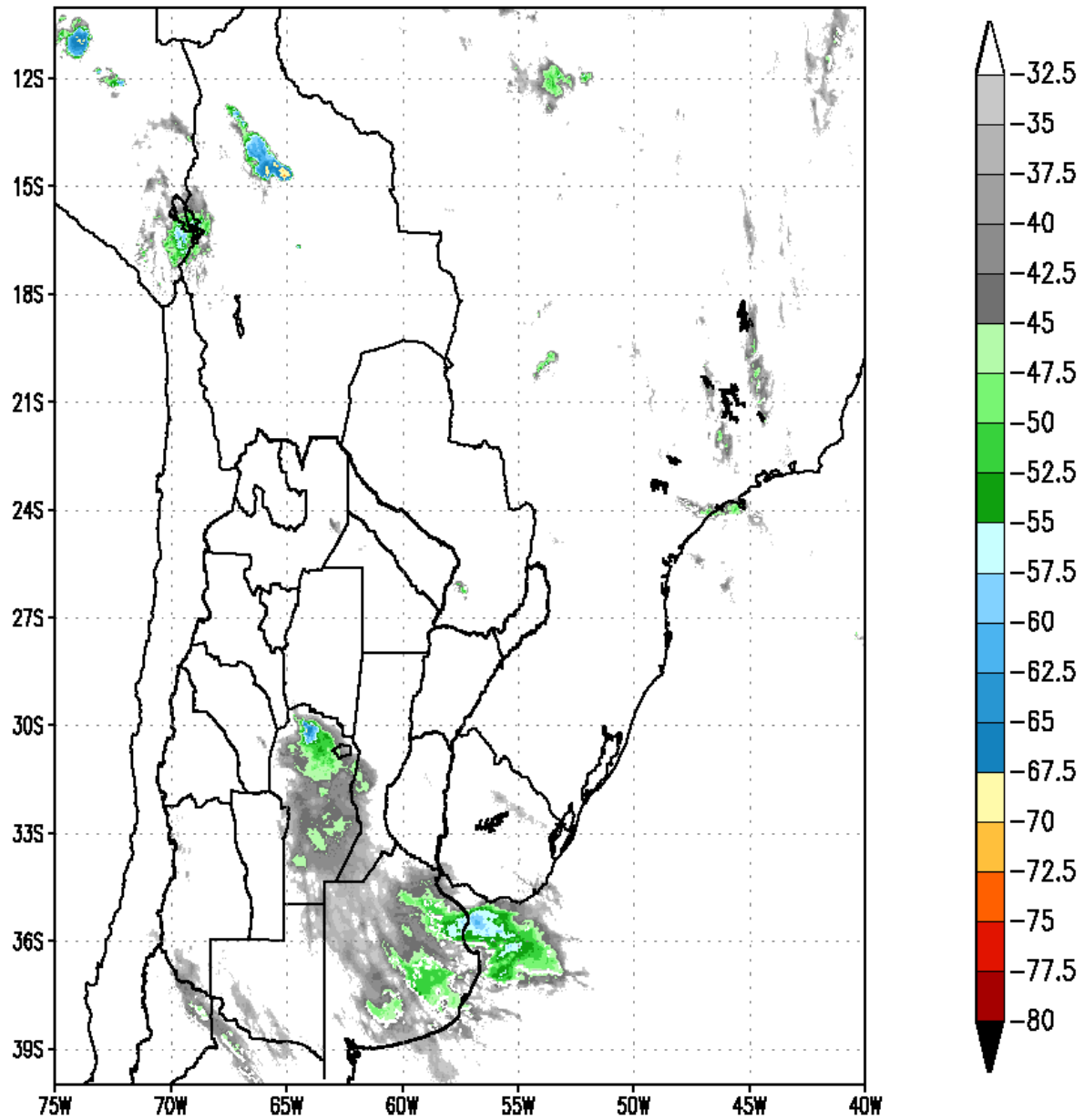
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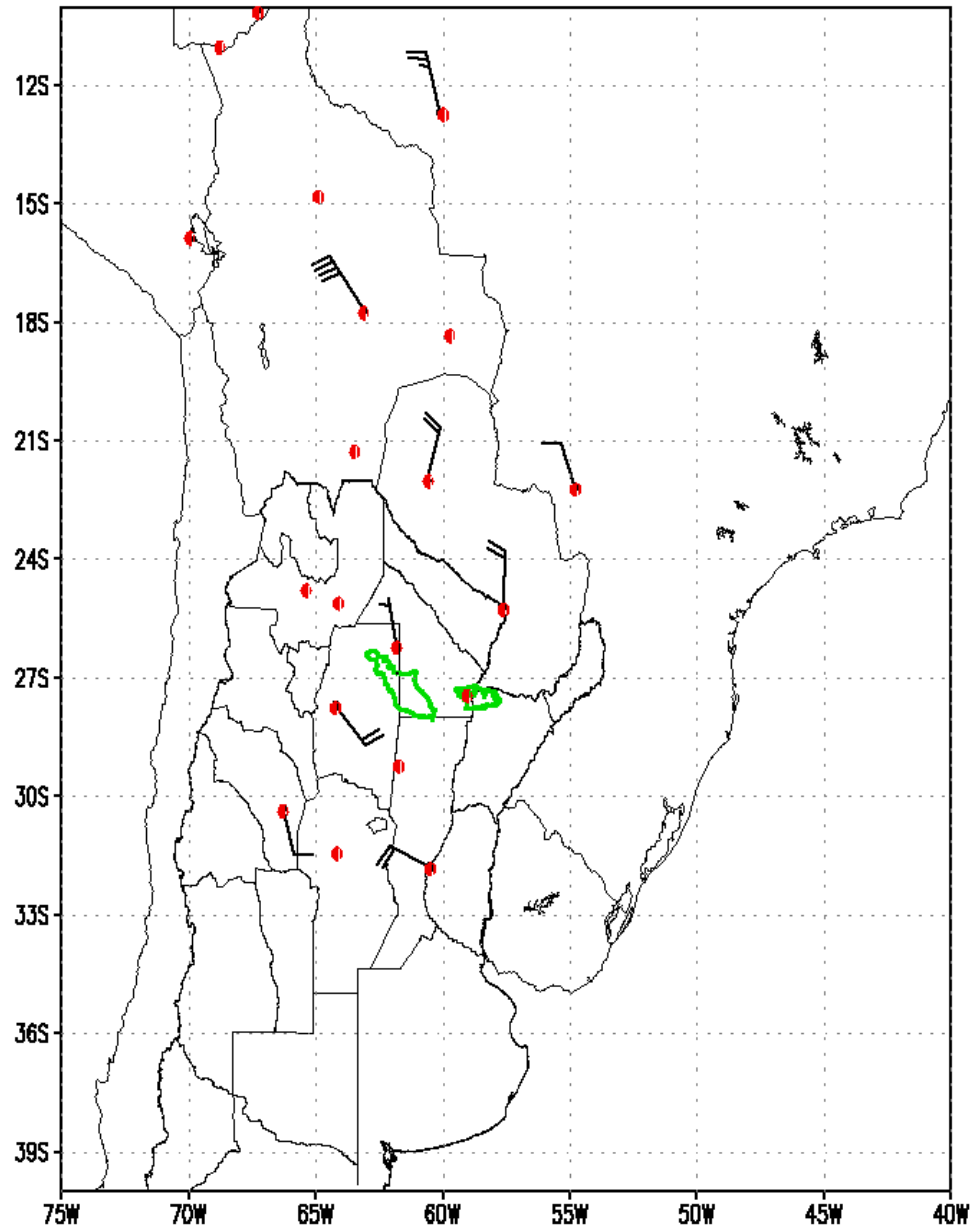
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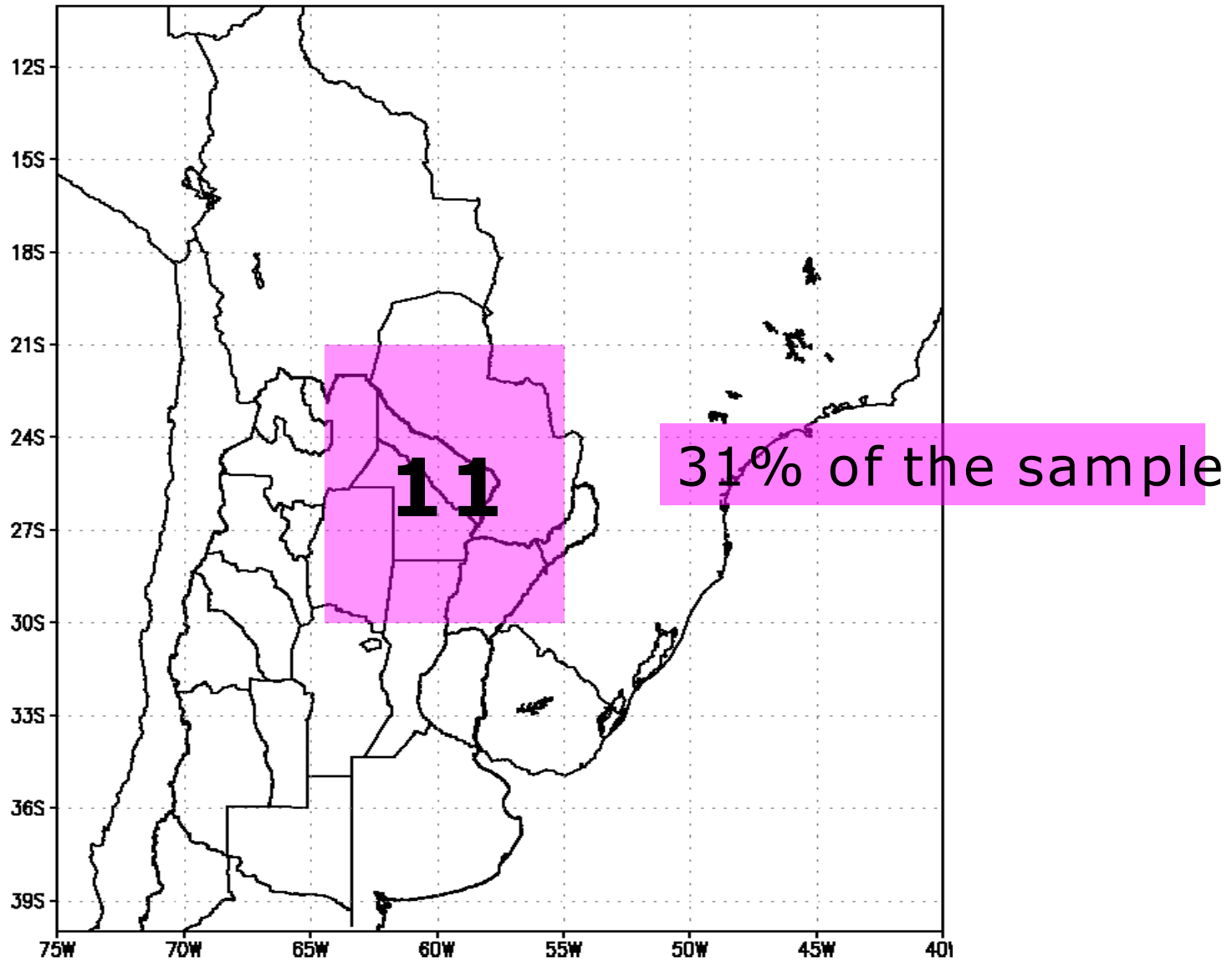
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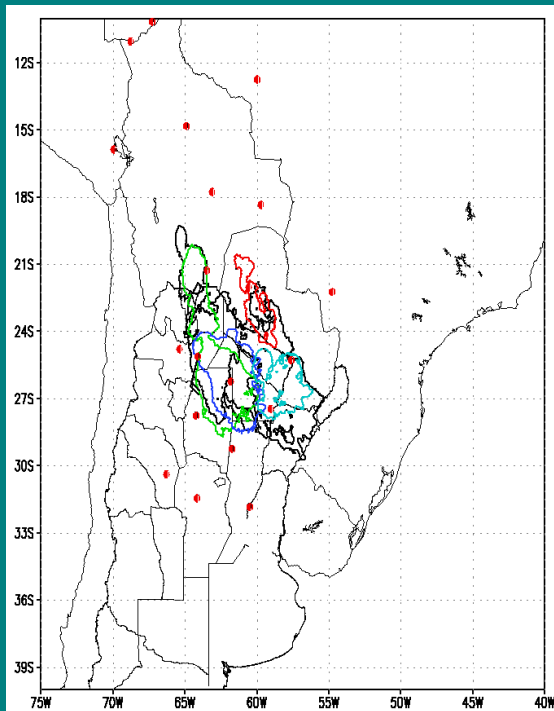
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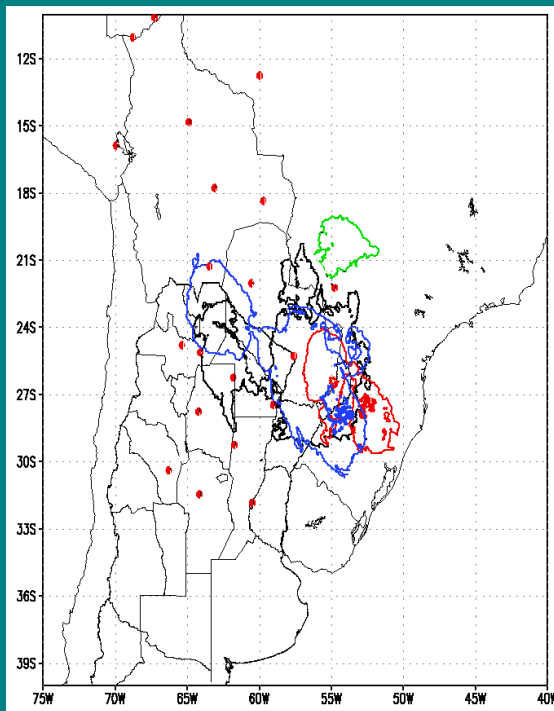
MCS during SALLJEX with nocturnal maximum extent



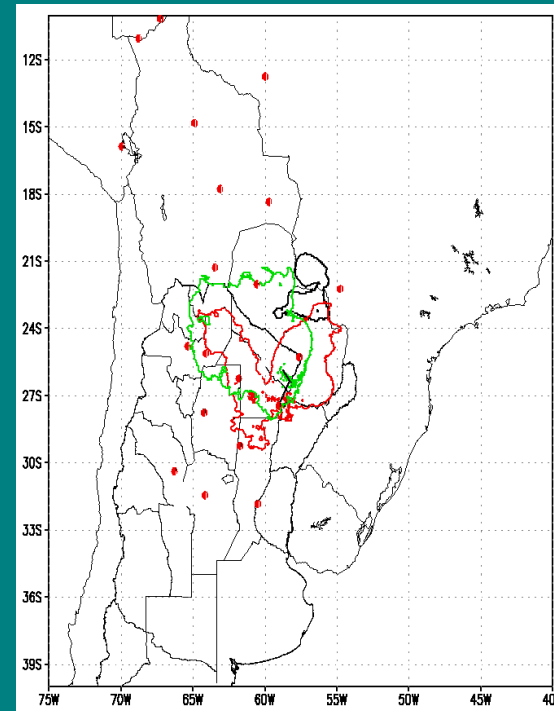
03



06



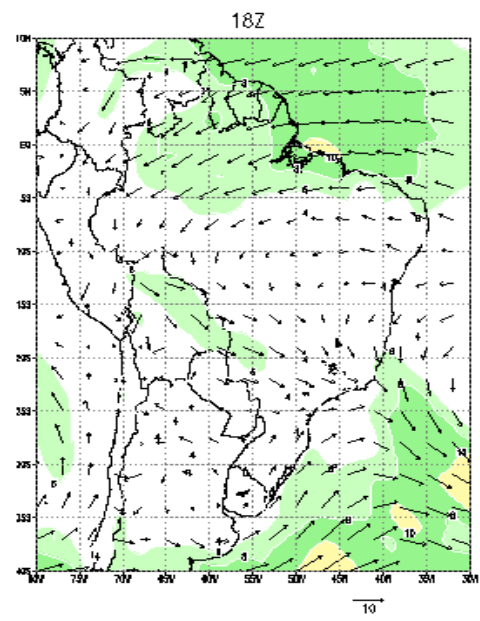
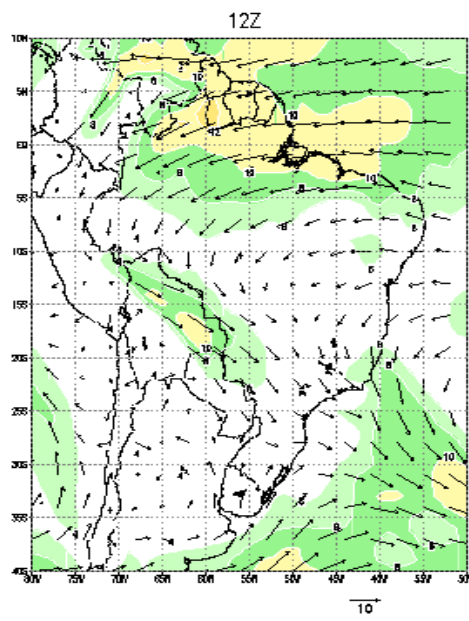
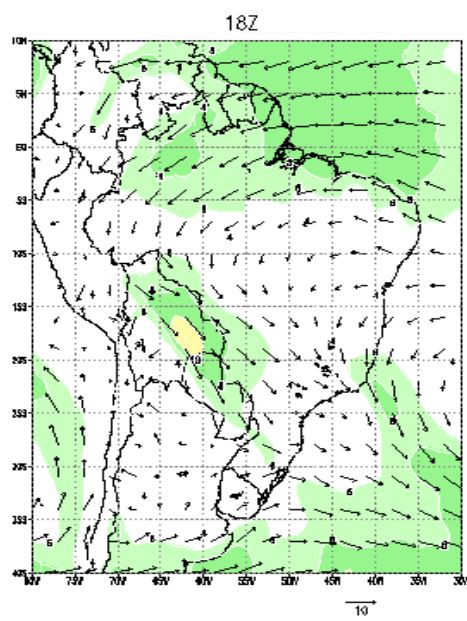
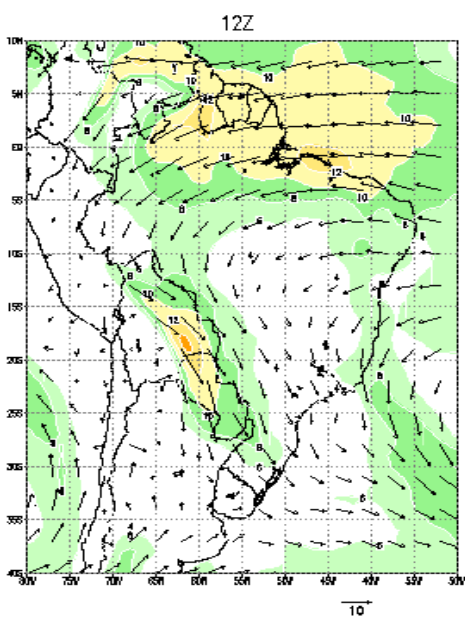
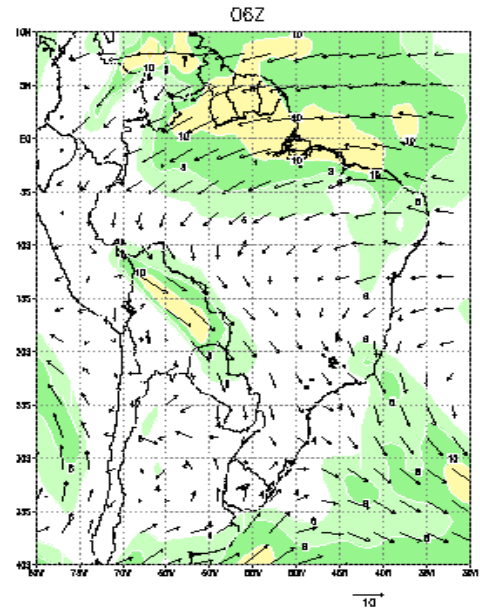
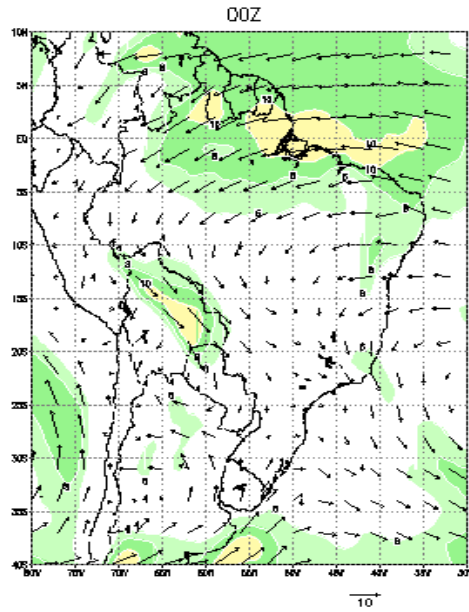
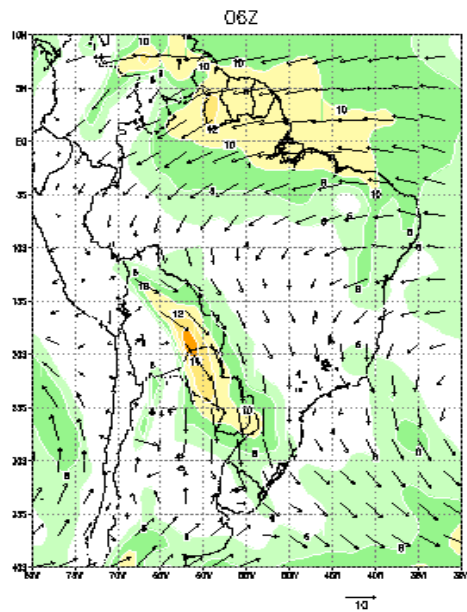
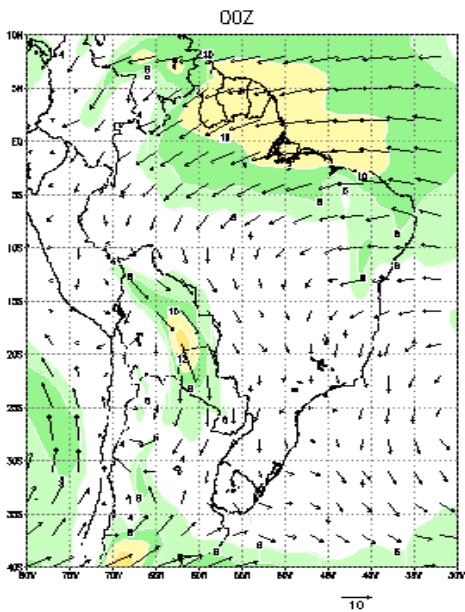
09



Wind 850 hPa

Day -1

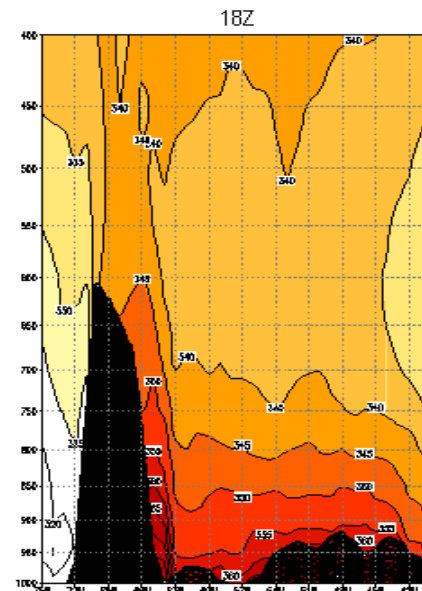
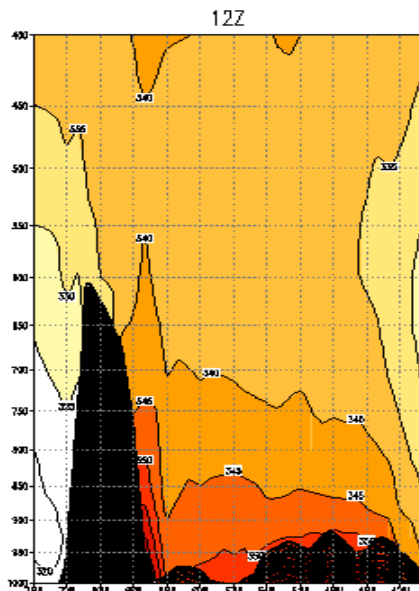
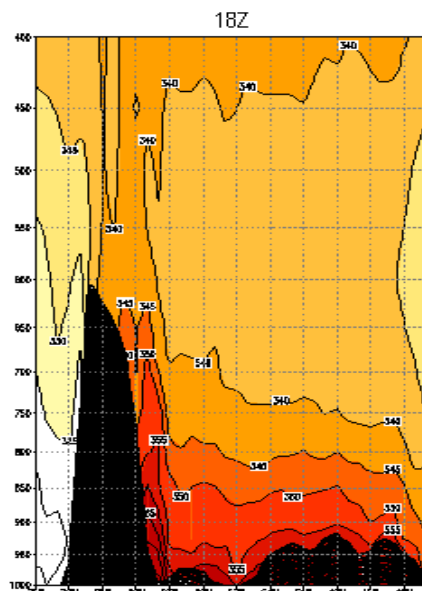
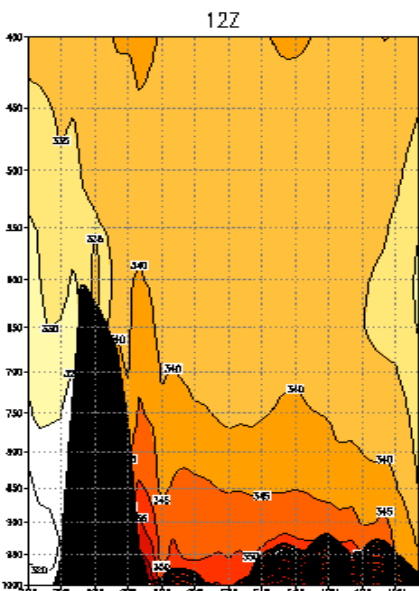
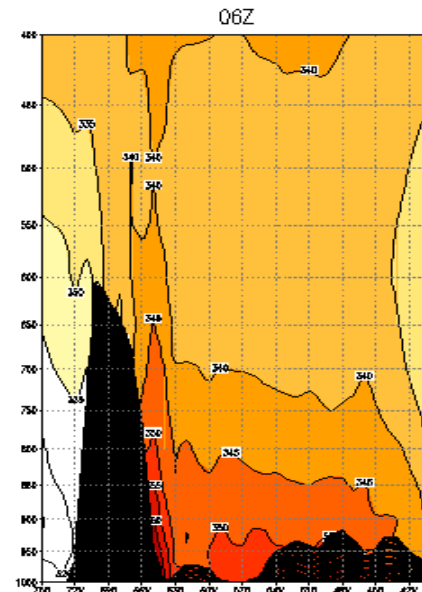
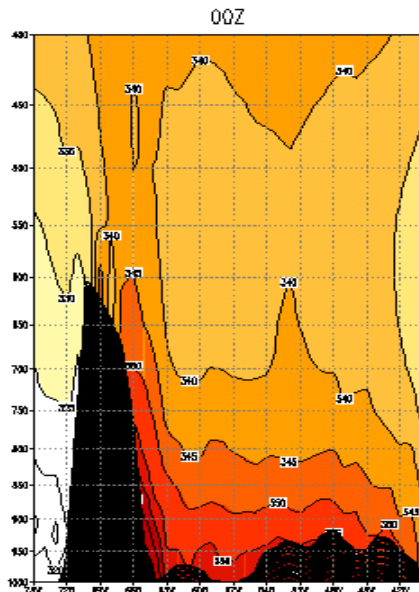
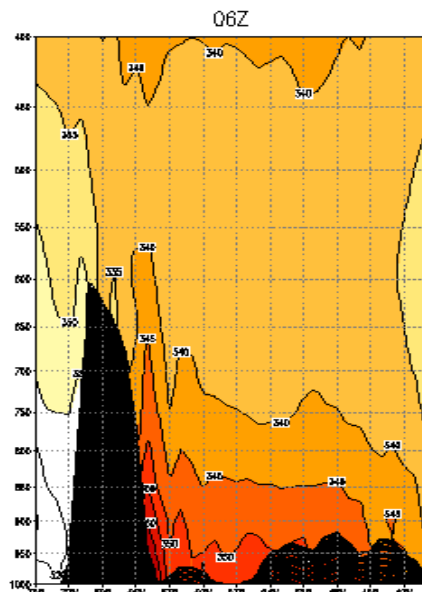
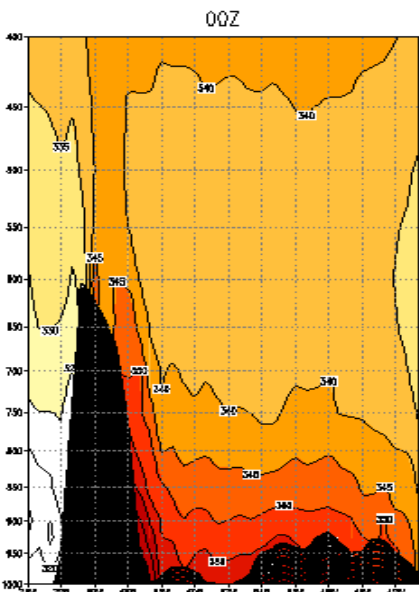
Day 0



θ_e 18S

Day -1

Day 0



θ_e 27S

Day -1

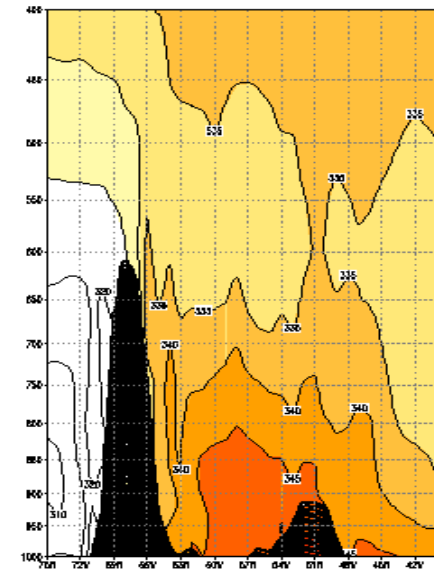
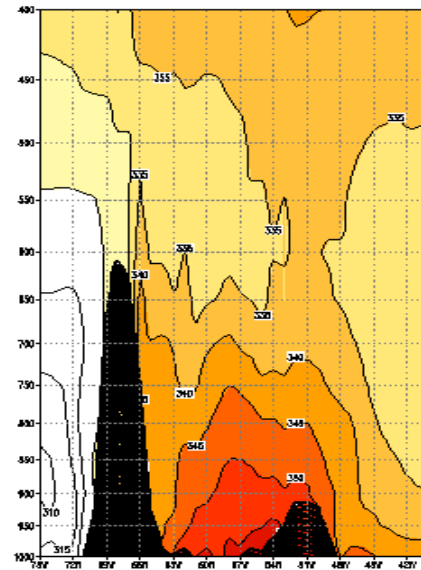
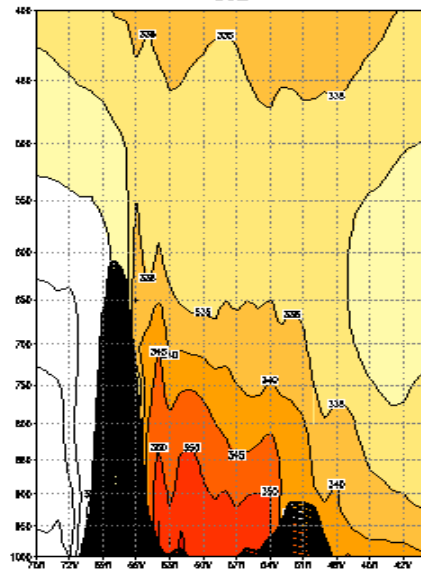
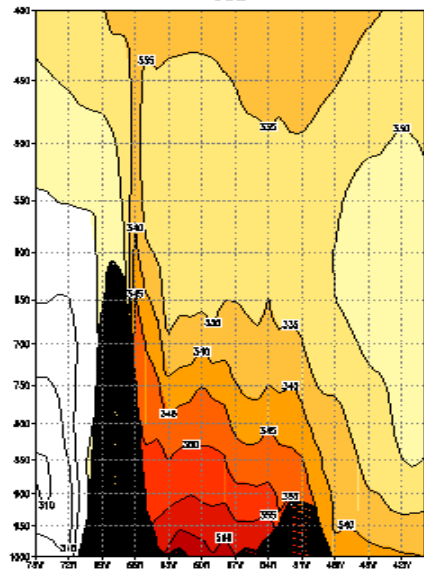
Day 0

00Z

06Z

00Z

06Z

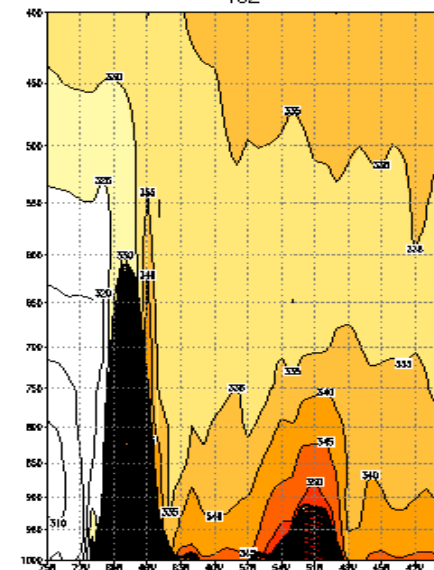
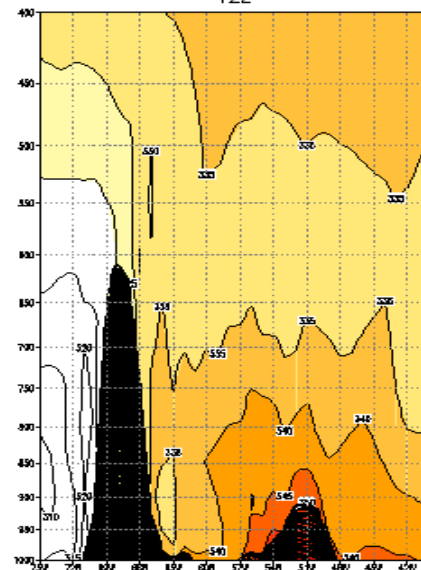
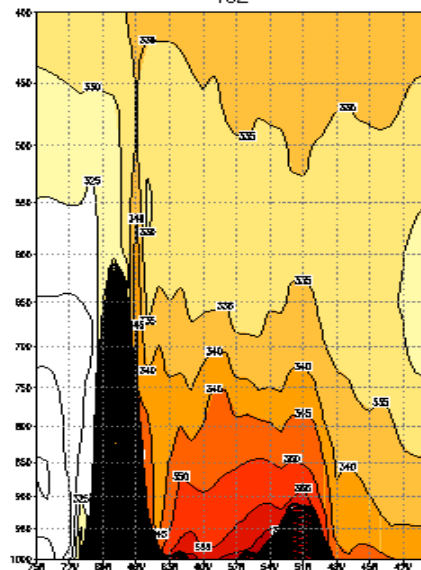
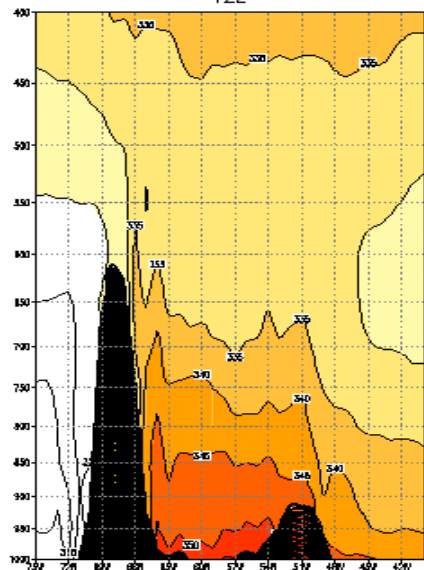


12Z

18Z

12Z

18Z



Meridional wind component 23S

Day -1

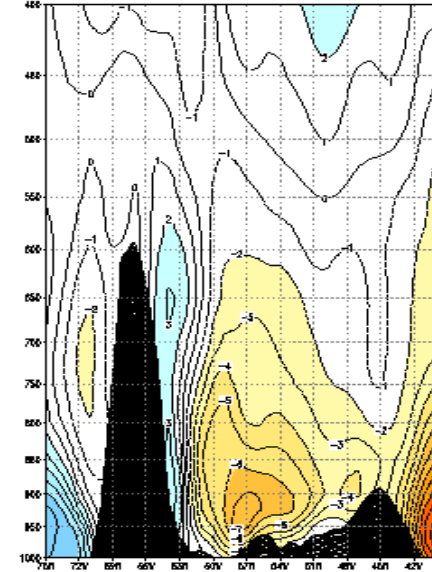
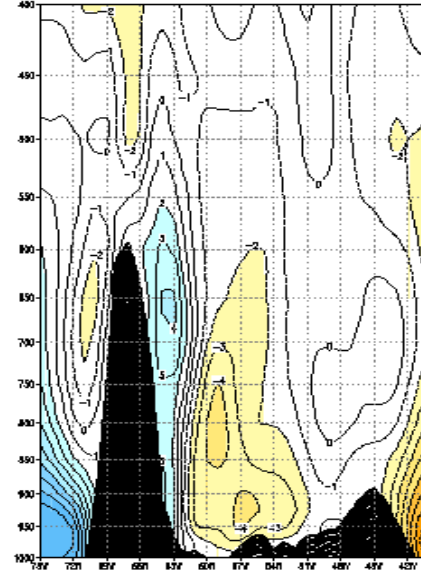
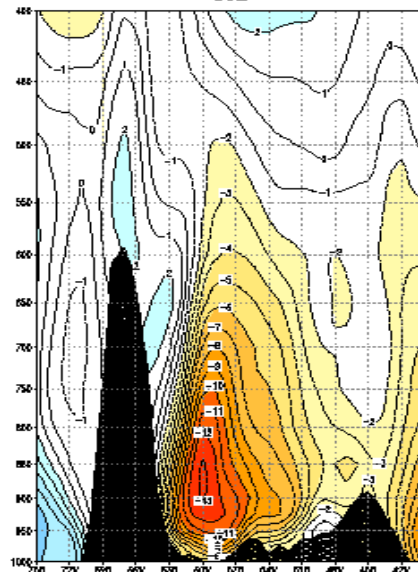
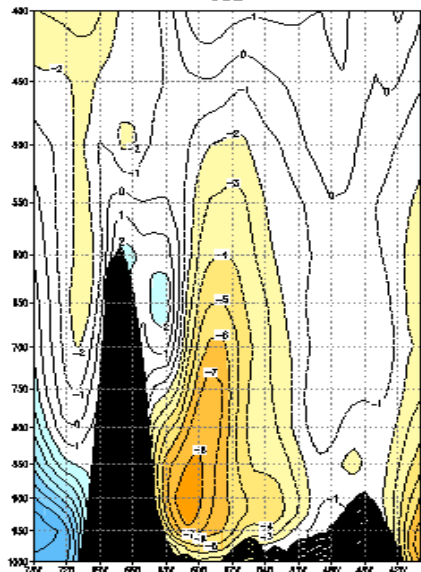
Day 0

00Z

06Z

00Z

06Z

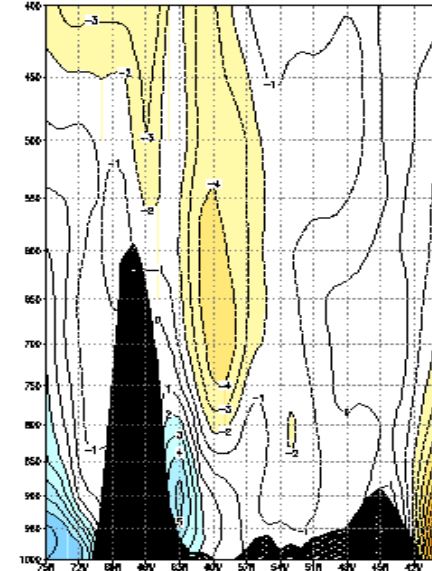
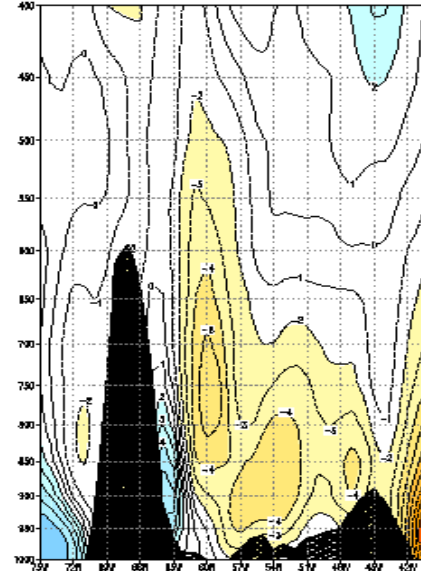
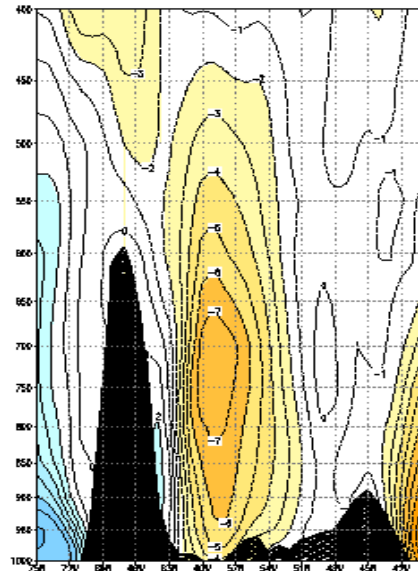
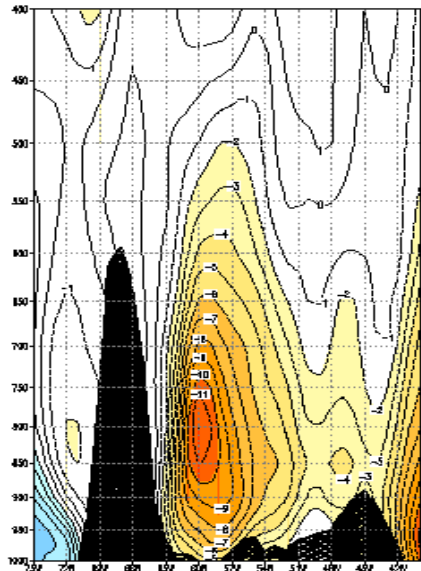


12Z

18Z

12Z

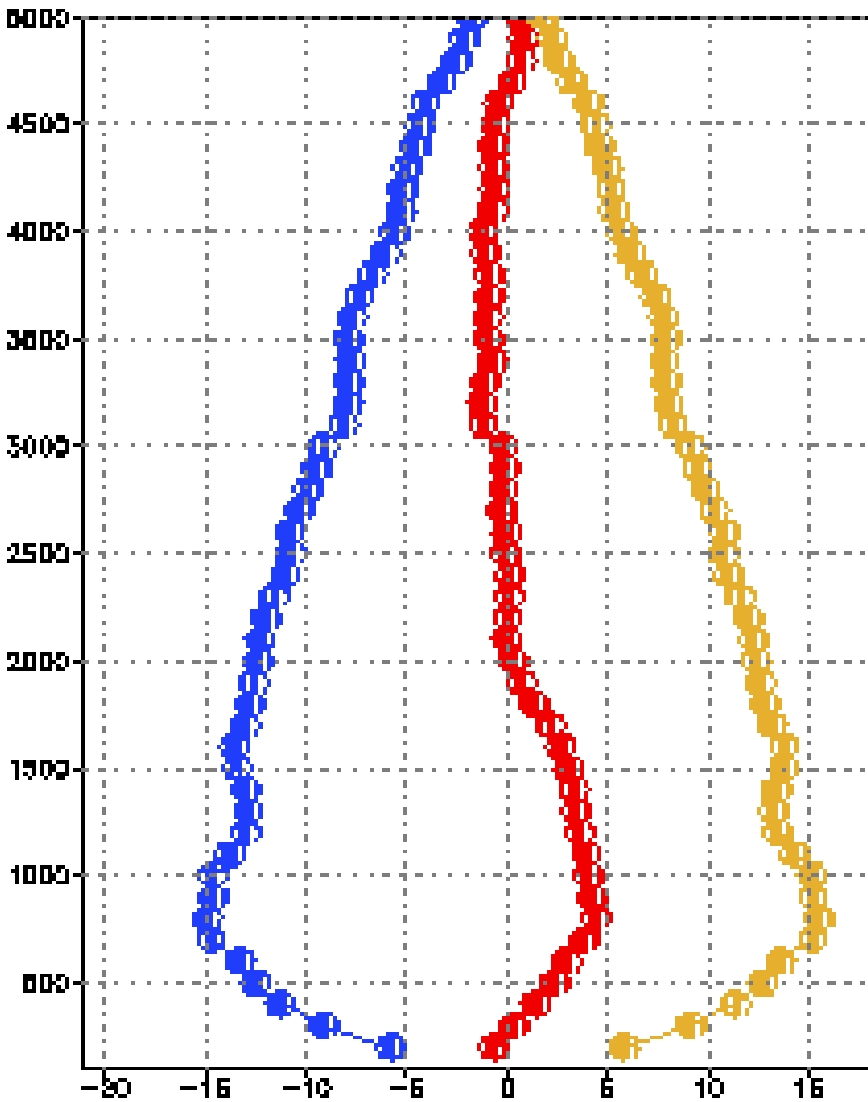
18Z



Mariscal Estigarribia

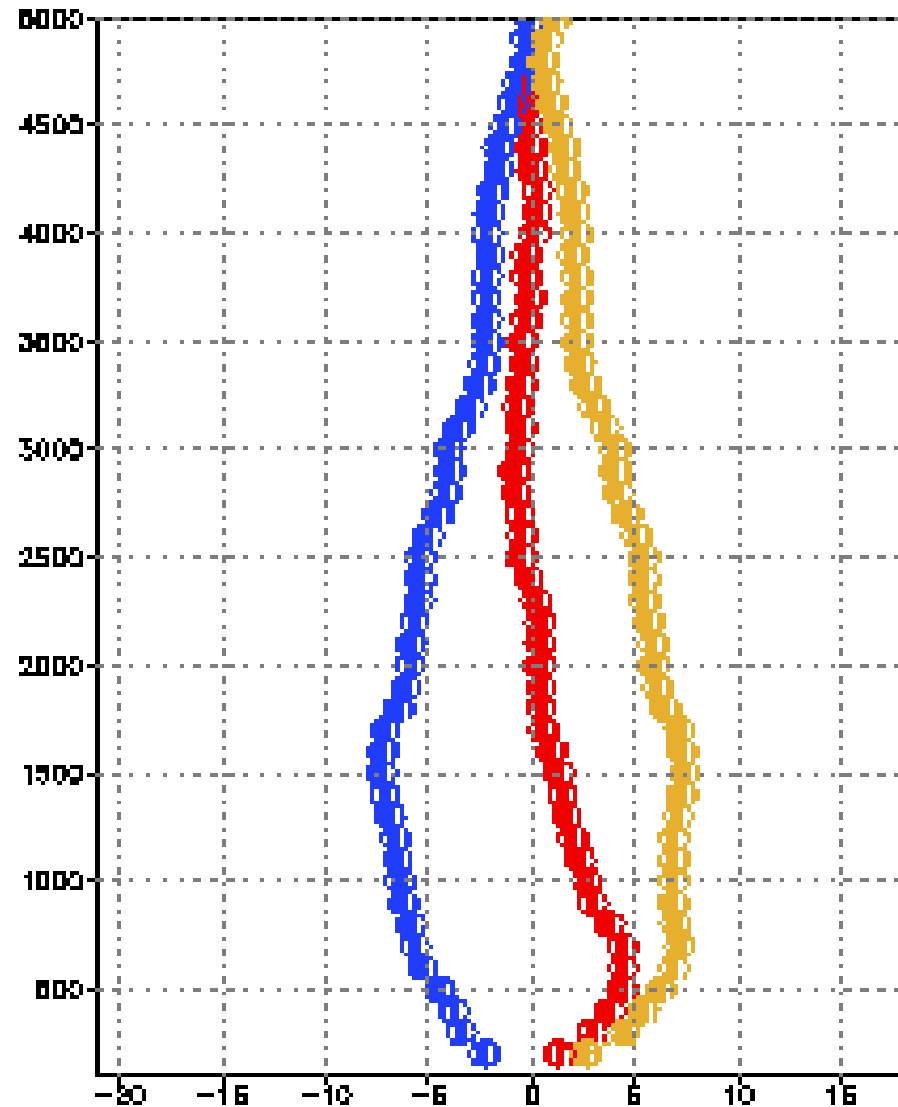
Day -1

06 Z



Day 0

06 Z

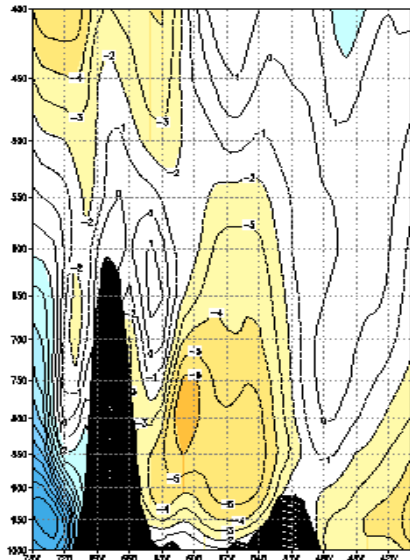


Meridional wind component 27S

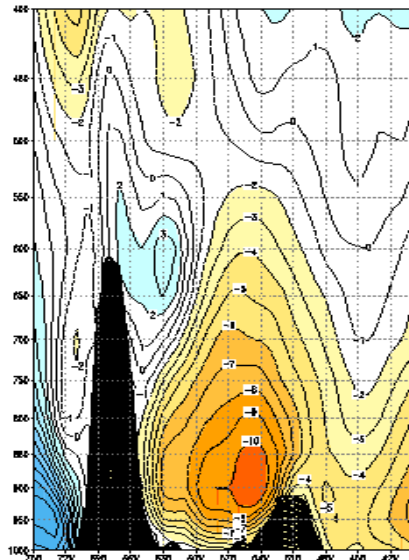
Day -1

Day 0

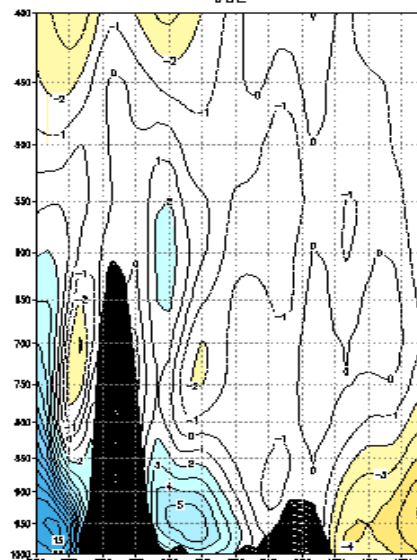
00Z



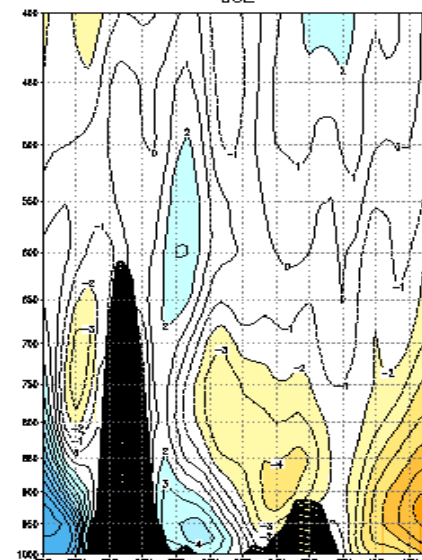
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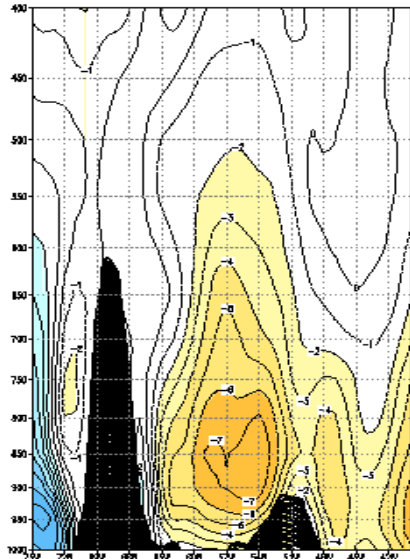
00Z



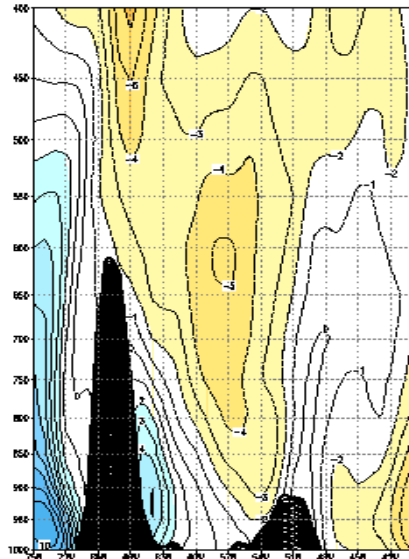
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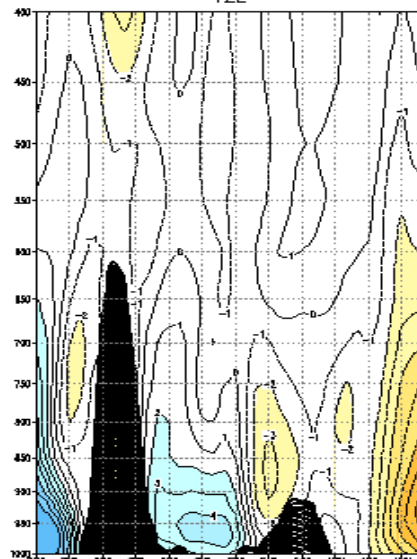
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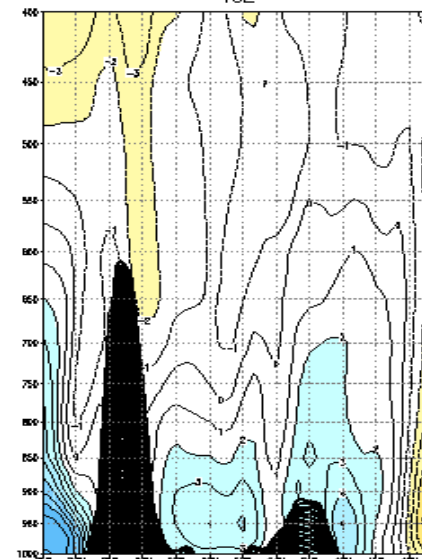
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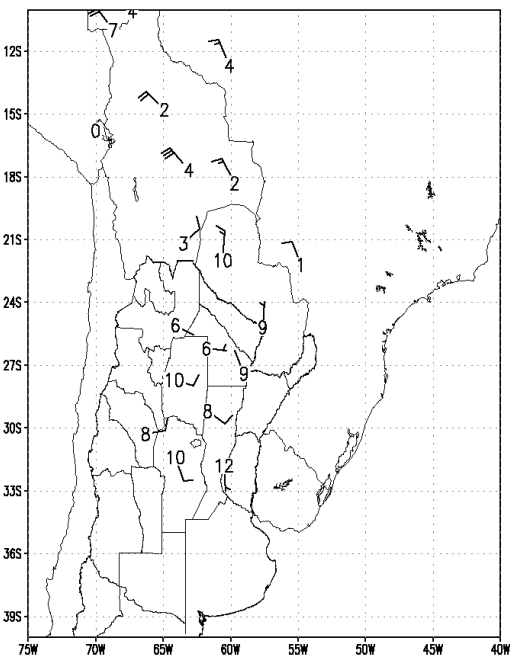
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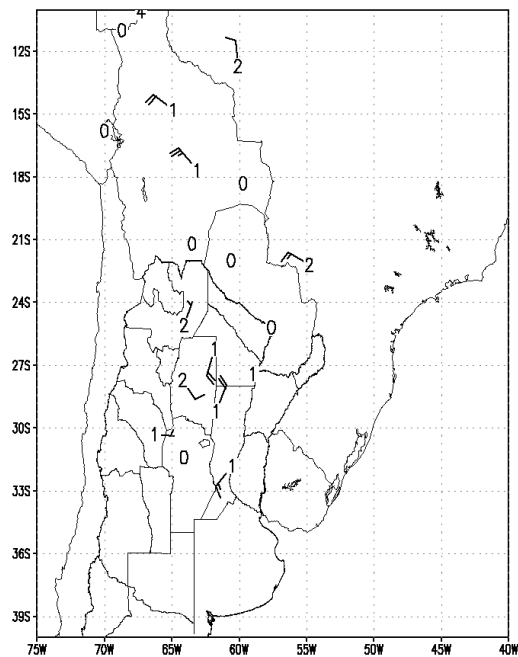
18Z



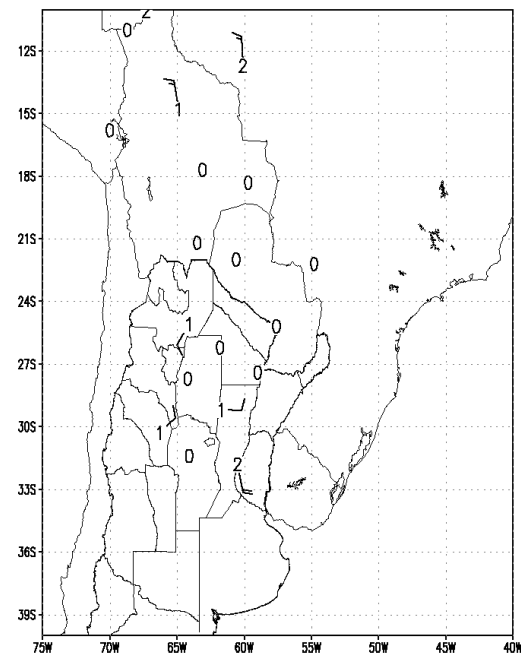
21 1500 ASL



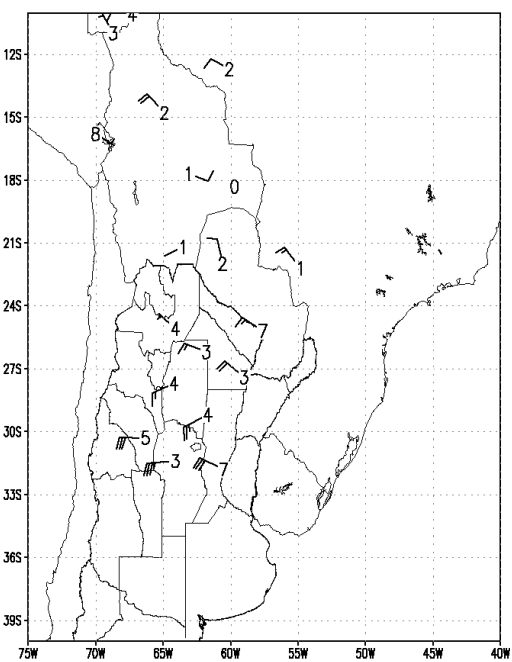
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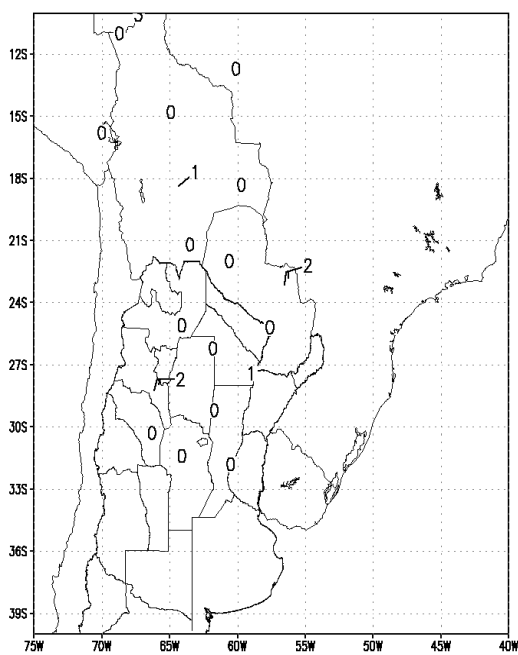
03 1500 ASL



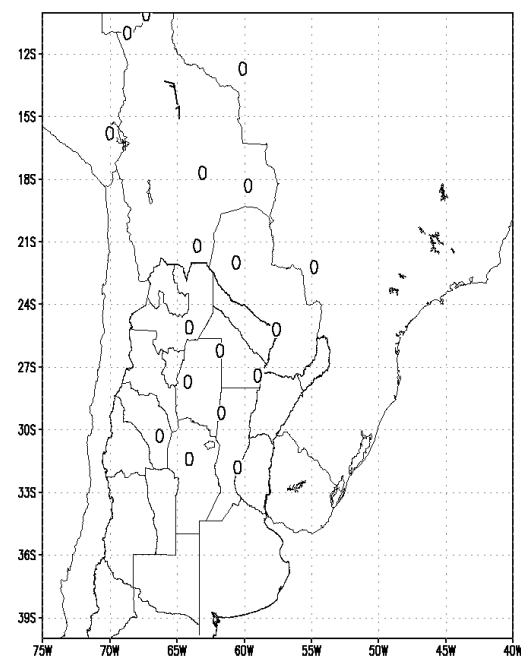
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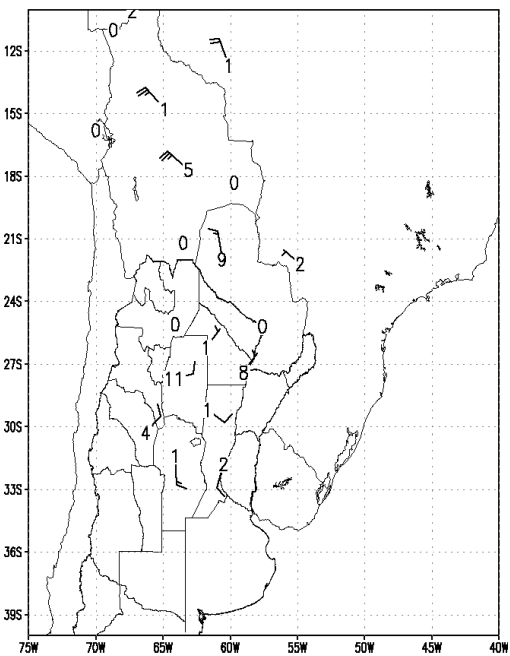
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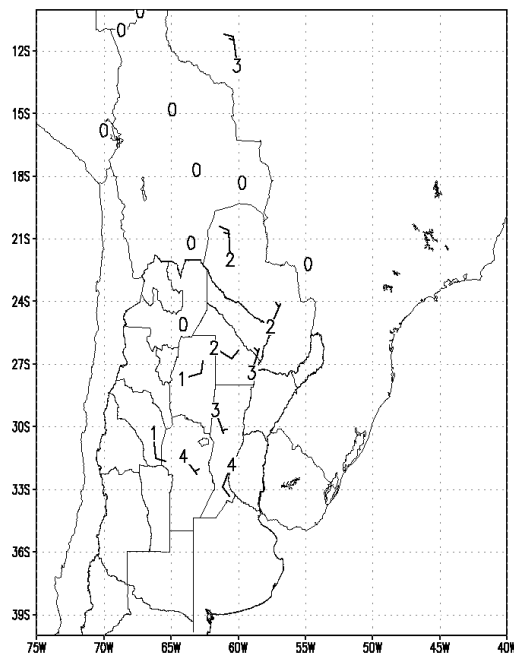
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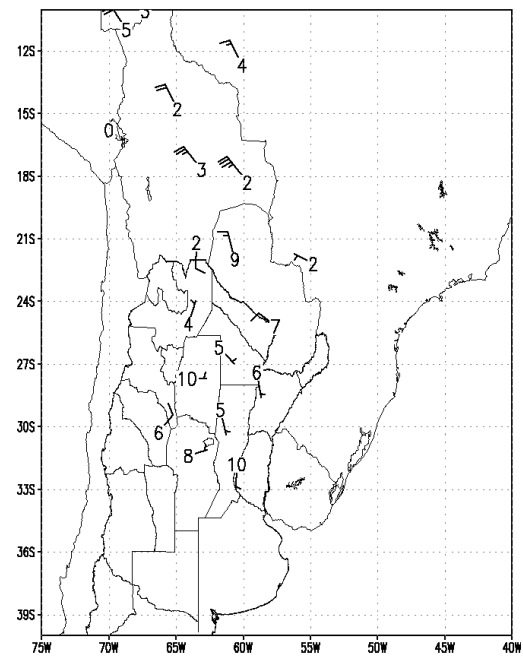
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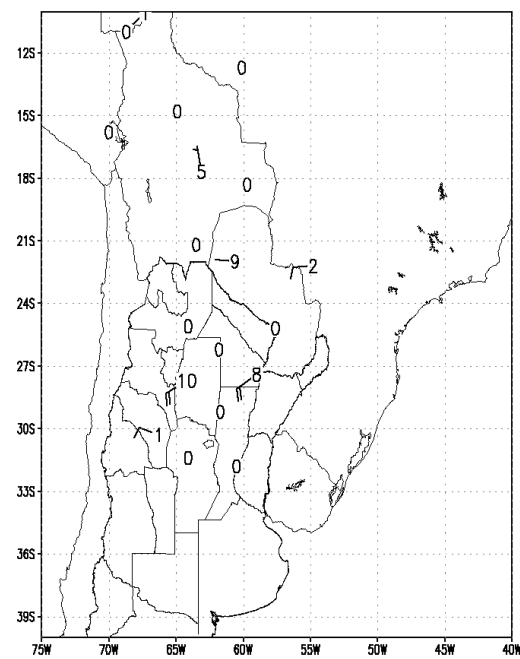
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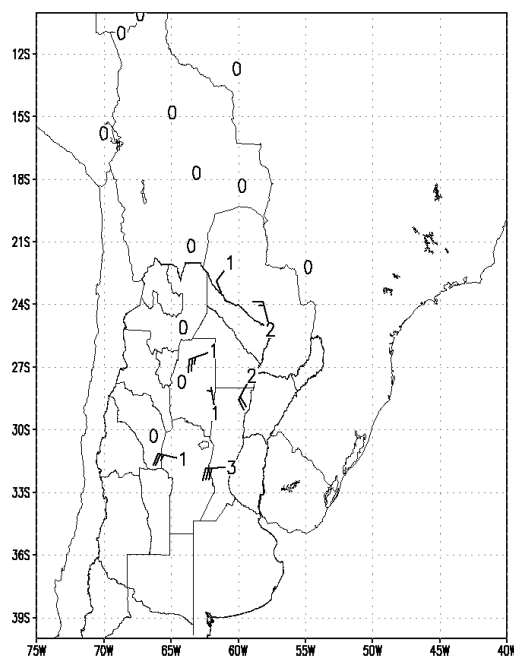
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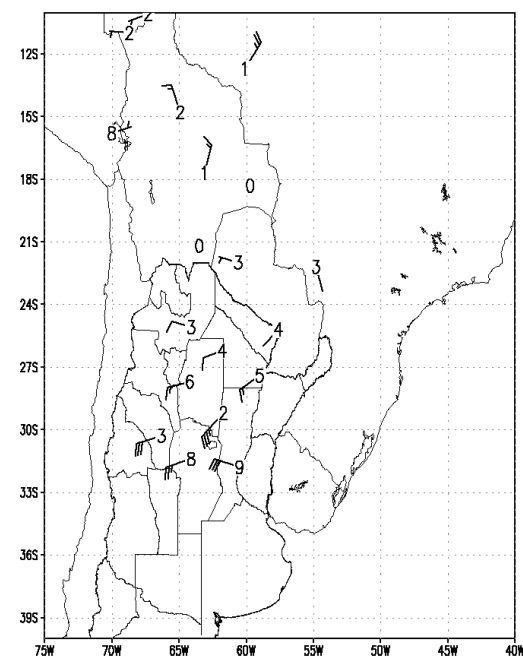
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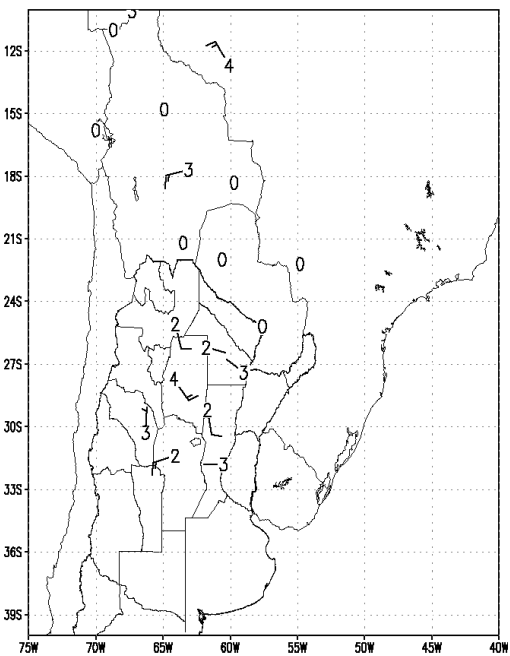
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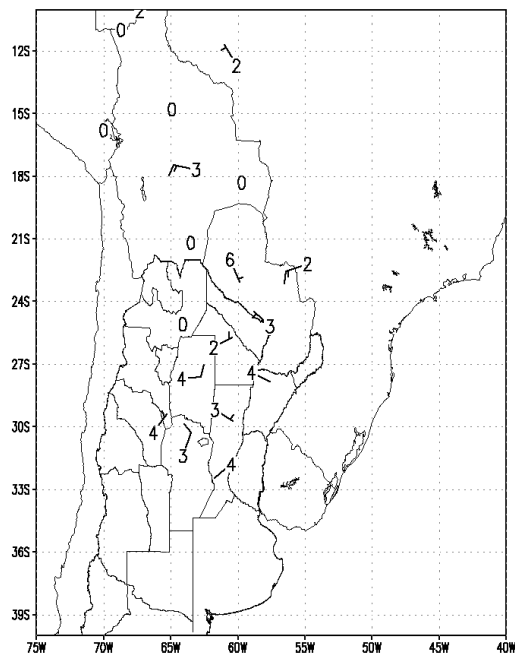
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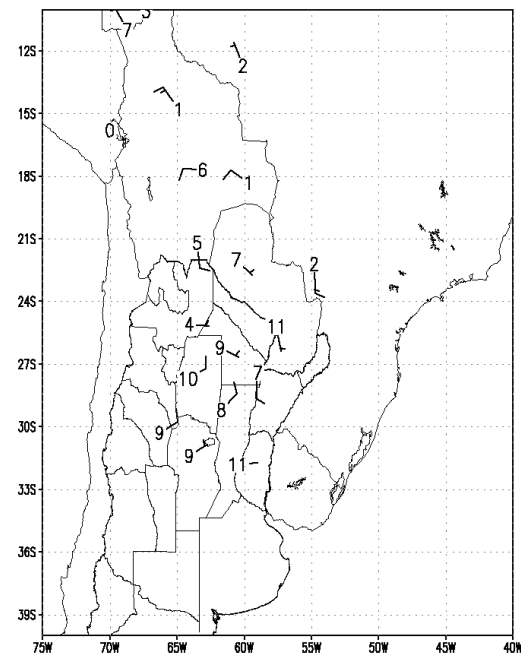
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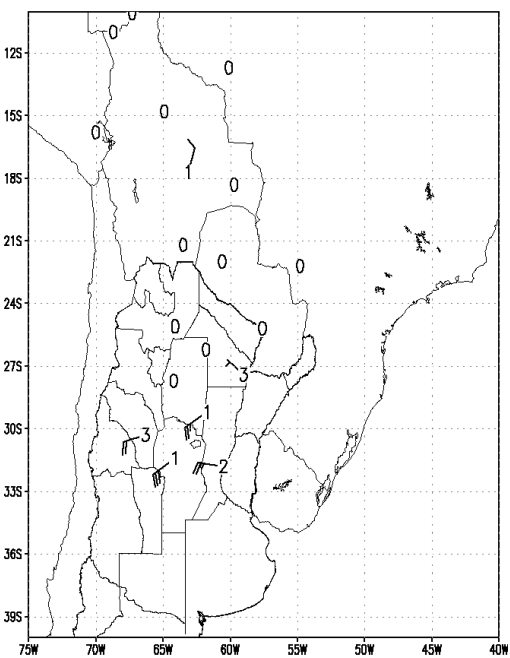
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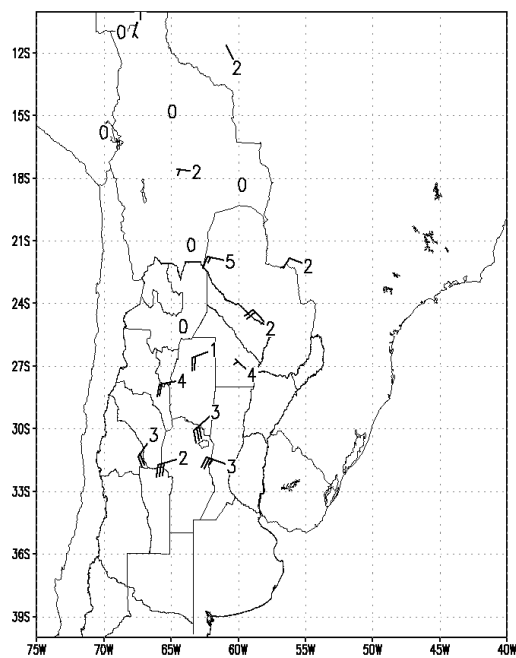
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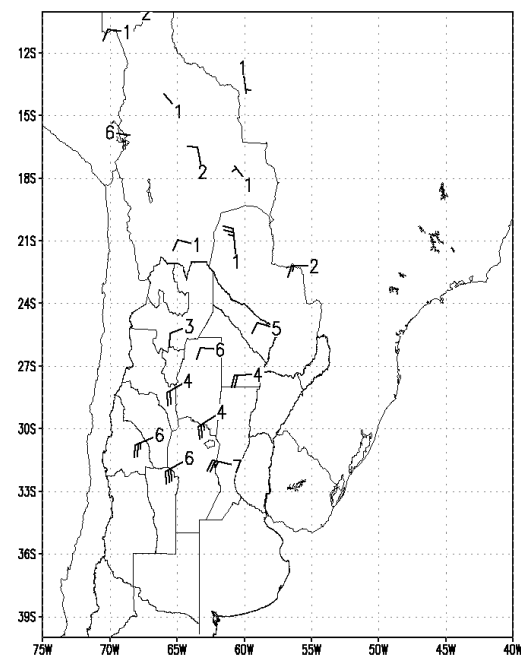
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Brief Summary of Interim Results

- Significant differences exist between properties of convective systems in Chaco/Argentina, and those in the SACZ farther east and north
- In Chaco/Argentina, more large MCSs peak during the night
- Case studies fail to show strong coincidence between nighttime max of SALLJ and MCSs
- Composite studies show strong SALLJ but northerly flow of moist air at 10 m/s is sufficient to feed and sustain the MCSs

