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I- INTRODUCTION

The South, Southeast and Center-West regions of Brazil are often affected by Mesoscale Convective Systems (MCS). The MCS play an important role in the accumulated rainfall in these regions, as well as others globe's regions, Cotton and Anthes (1989). The objective of this work is to find flow patterns at low and high levels of the troposphere for two MCSs events that occurred on October 05, 2009 and February 19, 2010 over the Southeast of South America, Figure 1a and 1b. These events were chosen because these MCS were associated with high values of rainfall, reaching over 50mm in 24 hours in some areas of the catchment area of systems, Figure 2a, b and c. Both events acted in the same region in southeast South America, causing precipitation over Uruguay, Argentina and southern Brazil.

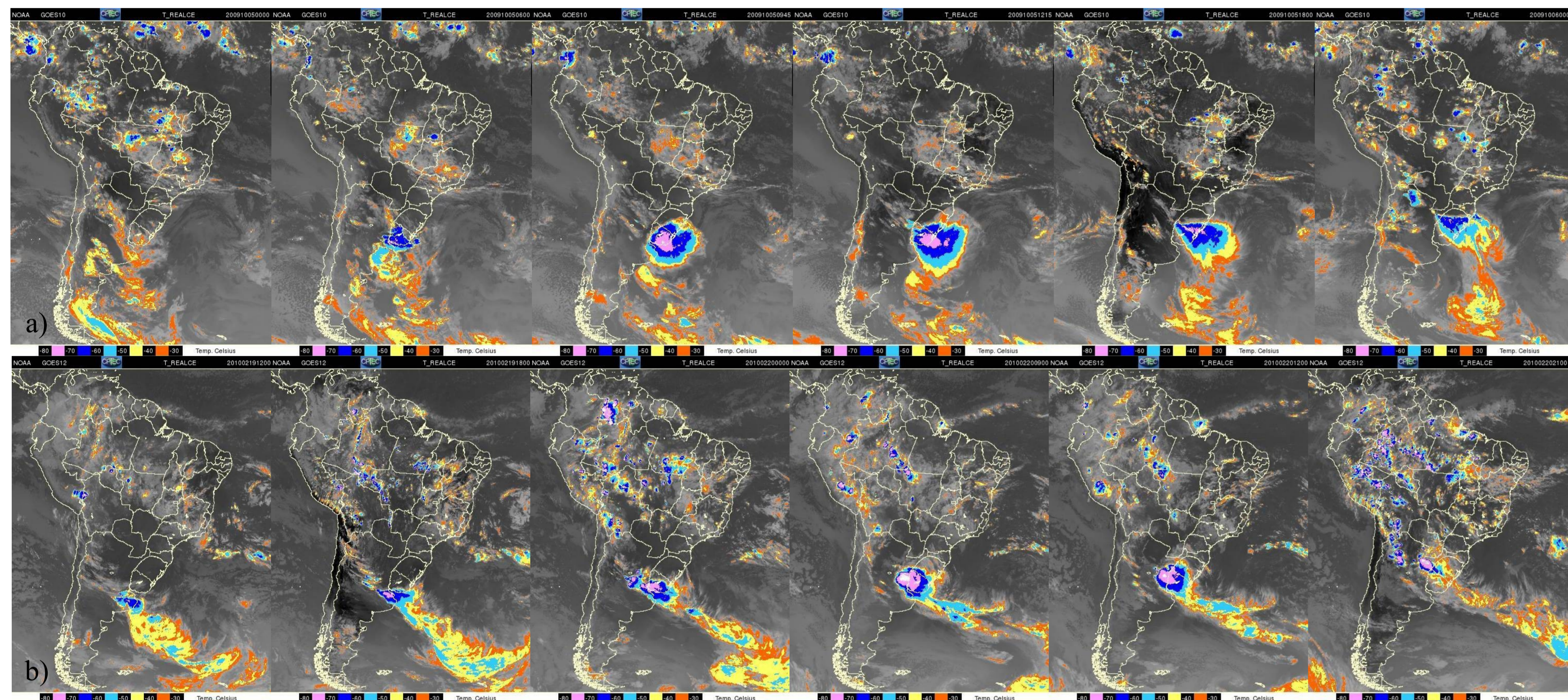


Figure 1. Satellite images related to the enhanced infrared SCM a) on 10/05/2009 at 00, 06, 09:45, 12 and 18 UTC and at 00 UTC on 10/06/2009 and b) on 02/19/2010 at 12 and 18 UTC and at 00, 09, 12 and 21 UTC on 02/20/2010. From DSA/CPTEC/INPE.

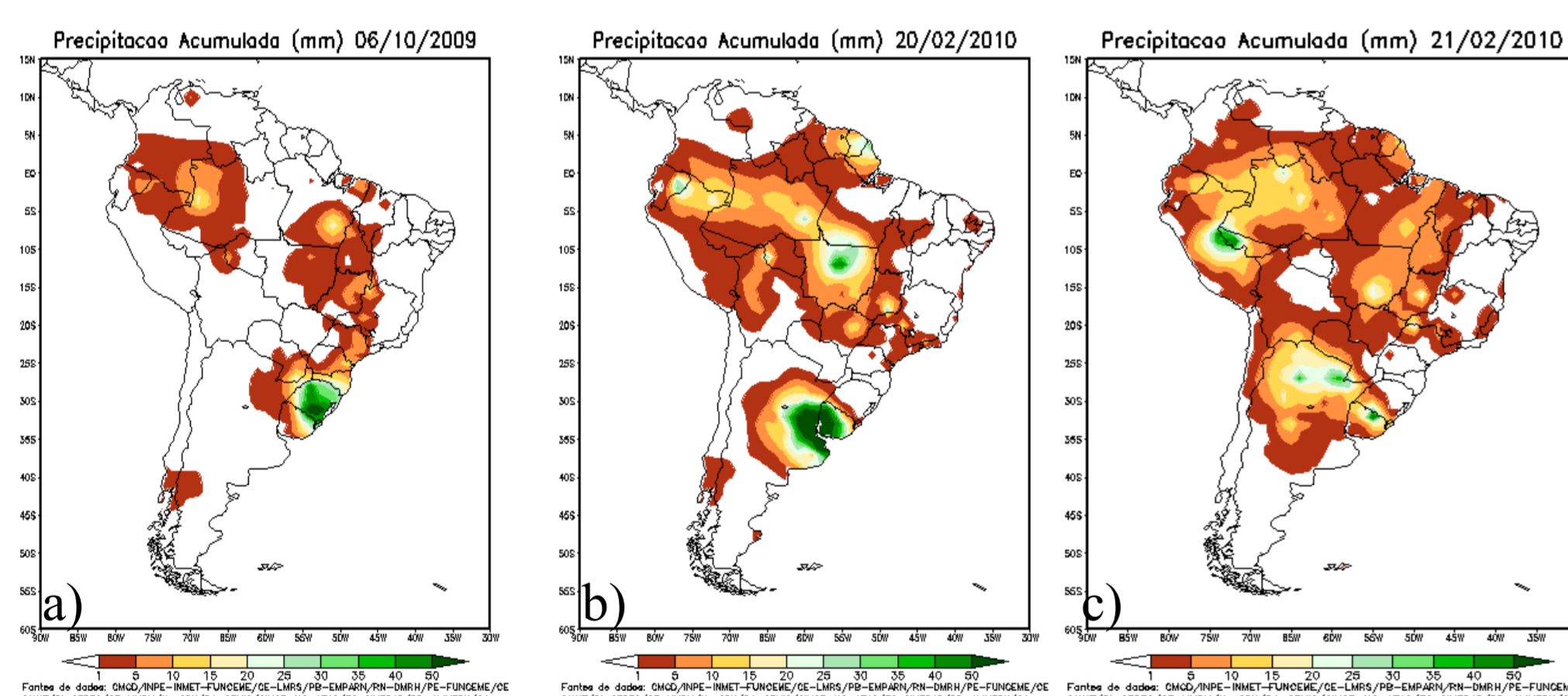


Figure 2. Accumulated rainfall in 24 hours on days a) 06/10/2009; b) 20/02/2010 and c) 21/02/2010. From CPTEC/INPE.

II-DATA AND METHODOLOGY

These systems were identified analyzing satellite images of the GOES-10 and GOES-12 and their impacted on the raingauges measures with large amount of precipitation. To analyze the life cycle of these MCSs were used meteorological fields: SLP; low-level temperature advection and moisture advection (850hPa); omega (500hPa); wind at 850hPa and 250hPa. These fields were generated from the reanalysis data of the National Centers for Environmental Prediction/ National Center for Atmospheric Research (NCEP/NCAR).

V-ACKNOWLEDGEMENTS

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III-RESULTS

Features found in both MCS studied, some features are presented in the Figures 3 and 4:

- The MCSs occurred in association with a cold front in surface;
- Presence of a low pressure center west of the MCSs in the growing and in the mature stages, this center moves eastward along with the MCSs;
- Instability Index (Lifted index) indicates that the environment is favorable to the occurrence of storms;
- Positive advection of temperature and humidity in the early stages of the MCSs (low-level, 850 hPa) and negative advection in the dissipation stage;
- Moisture and heat transport from the Amazon region to the region of actuation of the systems by the LLJ;
- Coupling of low and high levels, ie, presence of jets of low and high levels.

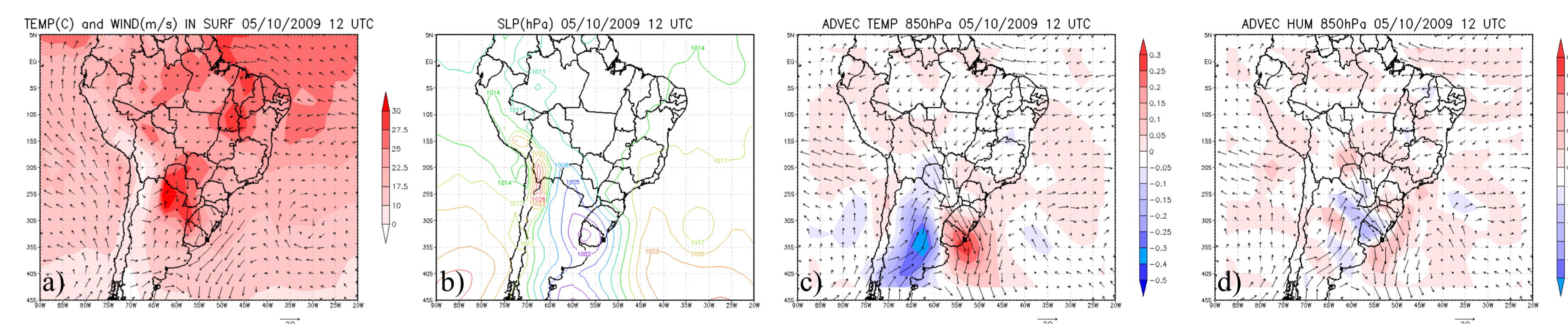


Figure 3. Meteorological field of the SCM at the time that correspond the max extension. a) temperature and wind in the surface; b) sea level pressure; c) temperature advection in 850hPa and d) moisture advection in 850hPa on 10/05/2009 at 12 UTC. From NCEP/NCAR.

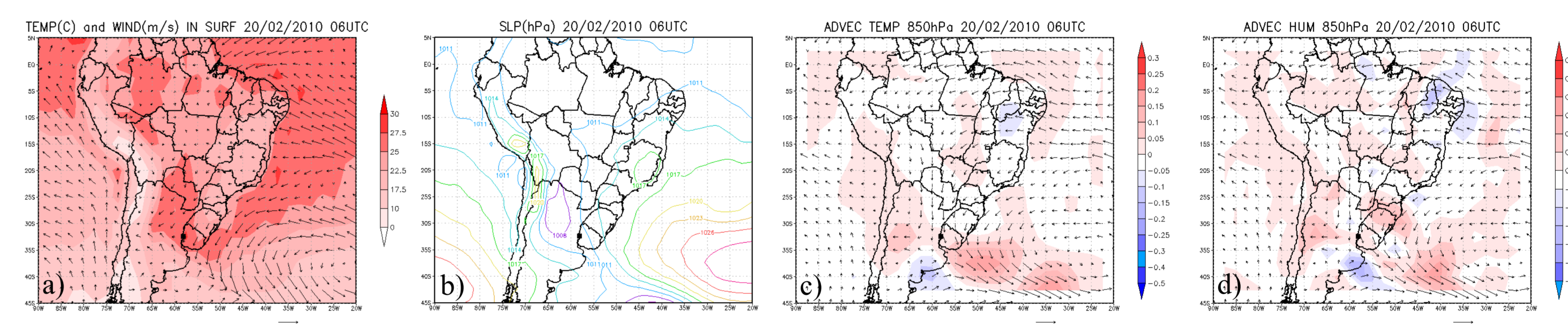


Figure 4. Meteorological field of the SCM at the time that correspond the max extension. a) temperature and wind in the surface; b) sea level pressure; c) temperature advection in 850hPa and d) moisture advection in 850hPa on 02/20/2009 at 06 UTC. From NCEP/NCAR.

IV-CONCLUSION

The presence of a cold front in surface and moisture and heat transport by JBN contributed to the formation and intensification of these systems, and these characteristics are similar to those found by Maddox (1983), Silva Dias et al. (2009), and others. Data from the NCEP / NCAR, even with a low resolution 2.5 ° x2.5°, represented a satisfactory way the main features related to the life cycle of the two MCSs studied.

VI-REFERENCES

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