

Weather Report (2010/03/03)

The atmosphere in Alcântara presented a stable condition, with a small amount of clouds during the whole period. The maximum of cloud cover did not exceed 3/8. Two layers of clouds were found during the day. The first one, with stratocumulus clouds, had a base height of about 480m. Cumulus clouds were also observed, with a height base of 540 m.

Figures 1 and 2 shows the wind behavior. It can be easily noted that during the morning the wind speed is near zero and starts to rise in the afternoon. As the speed wind rises, we can see that the predominant wind direction is from the first quadrant, NE, following the trade winds.

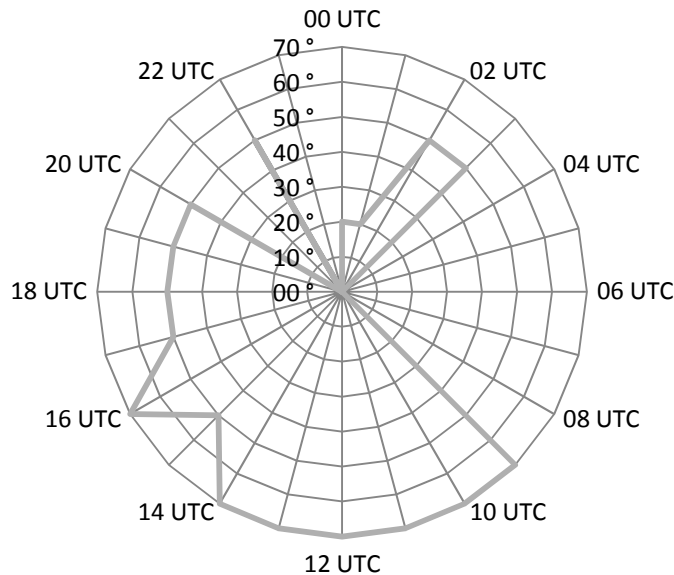


Figure 1 – Hourly wind direction for 2010/03/03.

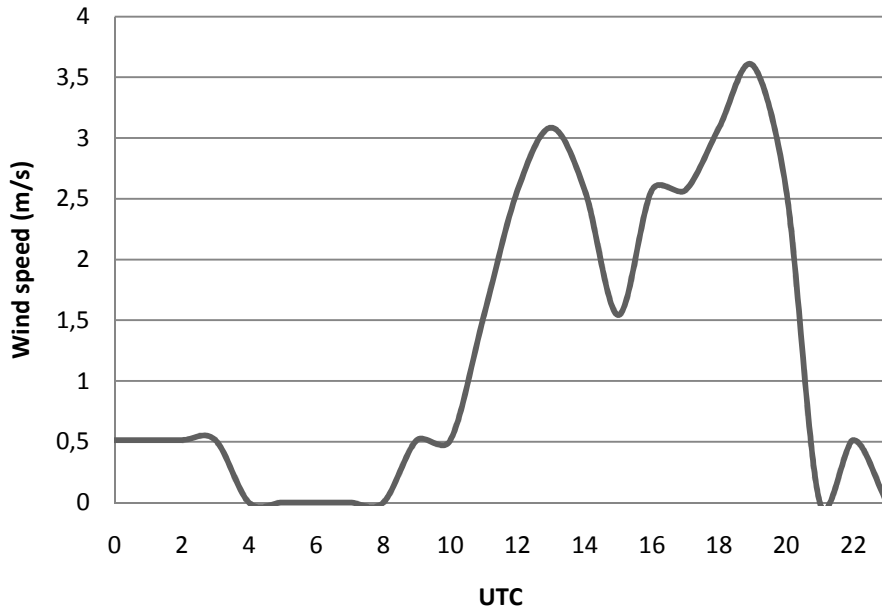


Figure 2 – Hourly wind speed for 2010/03/03.

The daily cycle of air temperature and mixing ratio is presented in Figure 3. The air temperature showed a well defined behavior, with a minimum between 26 and 28 °C during the morning and a maximum in the afternoon between 30 and 32 °C. The daily mixing ratio variation was not too big. The values were almost between 17 and 20 g/kg during the whole day. The pressure variation (Figure 4) presented two maximums and two minimums during the day. This variation is normal to a place that did not face a significant change in the weather.

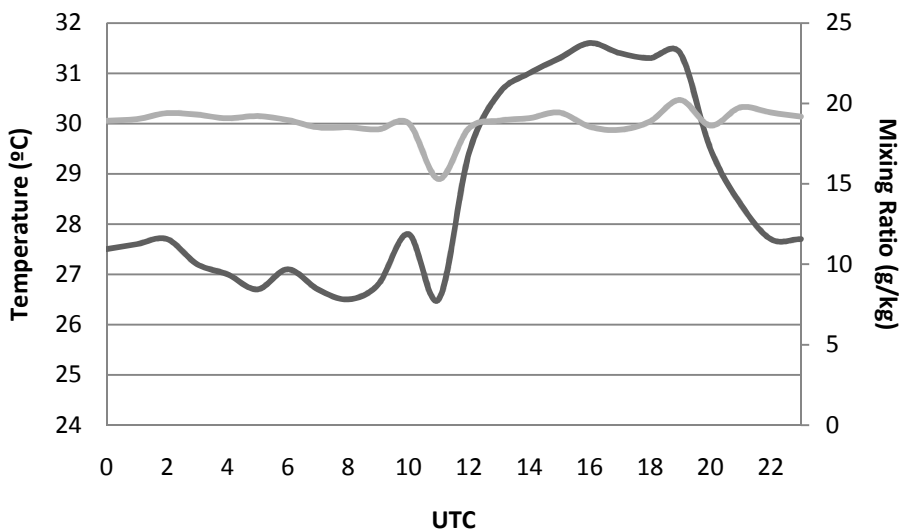


Figure 3 – Hourly temperature (black) and mixing ratio (grey) for 2010/03/03.

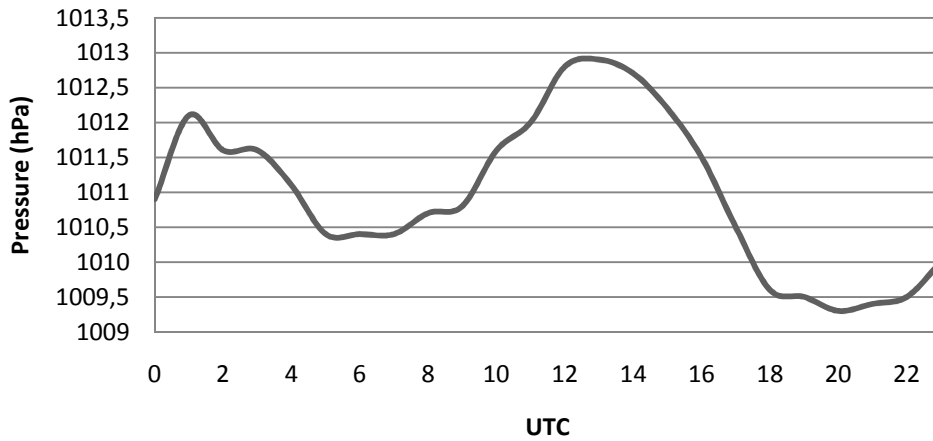


Figure 4 – Hourly sea level pressure for 2010/03/03.

Figure 5 presents the atmospheric conditions obtained by a radiosonde launched at São Luis (30 km from Alcântara). The instability indices show that the atmosphere had unstable conditions, and a huge cumulonimbus formation was observed really far from CLA. No severe weather was observed at Alcântara.

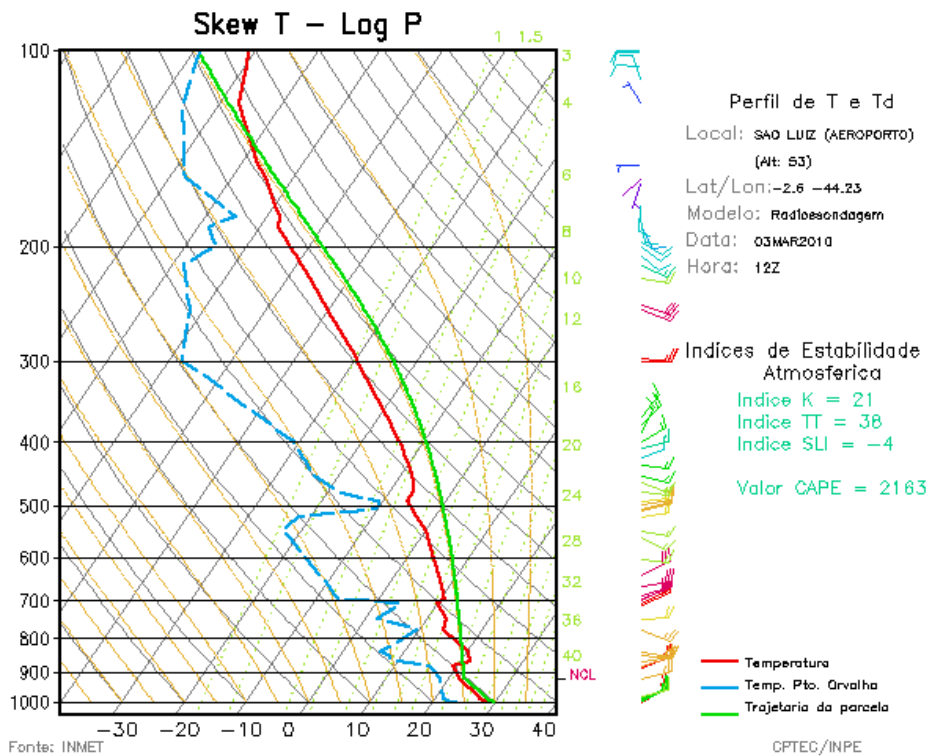
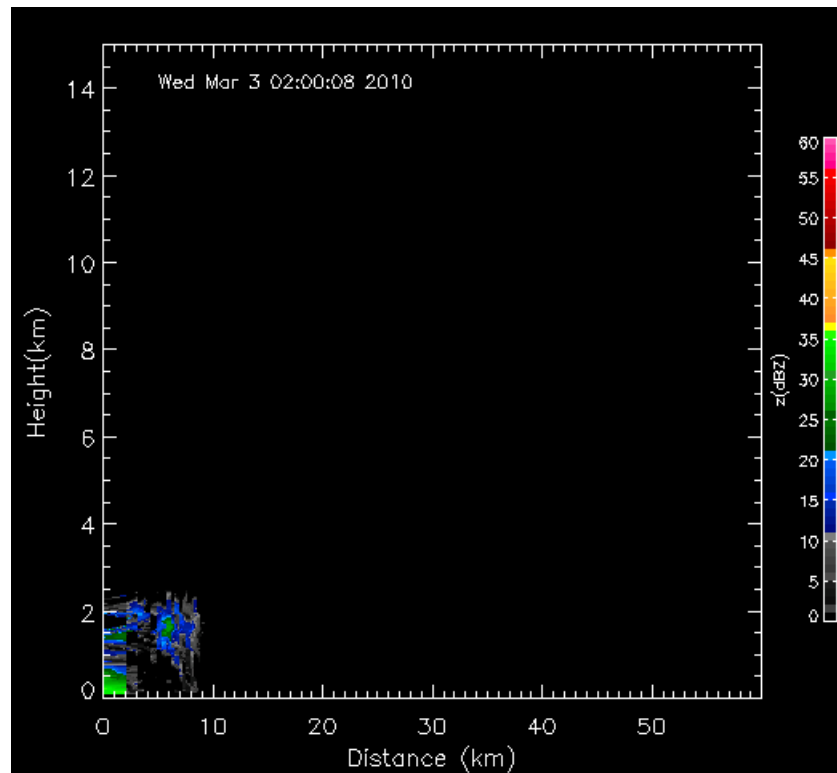


Figure 5 – Thermodynamic profile at São Luiz Airport Station.

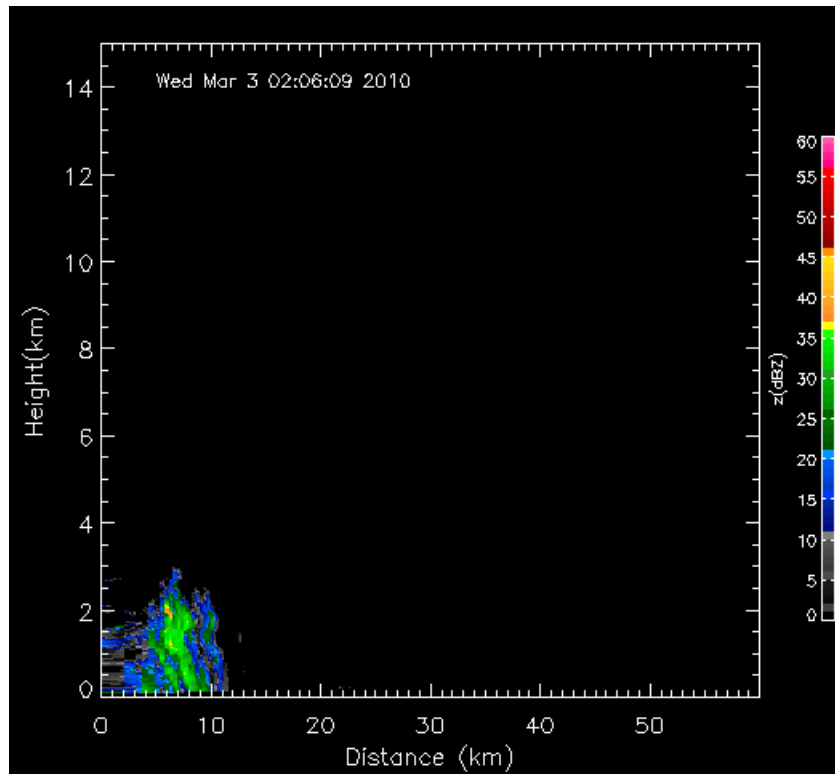
March, 3rd, was the first day that precipitation was measured during the campaign. This precipitation occurred at Delta Village at about 2:00 UTC. The Thies disdrometer registered an amount of 0.58 mm of precipitation. The rain gauges did not measure any precipitation. This could be explained by evaporative processes as the accumulated rain was pretty small.

The CLA RADAR also registered the 2:00 UTC precipitation (Figure 6). The RHI echoes shows that the precipitating cloud top reached a height of 3.5 km and that the duration of the rain event was 12 minutes.

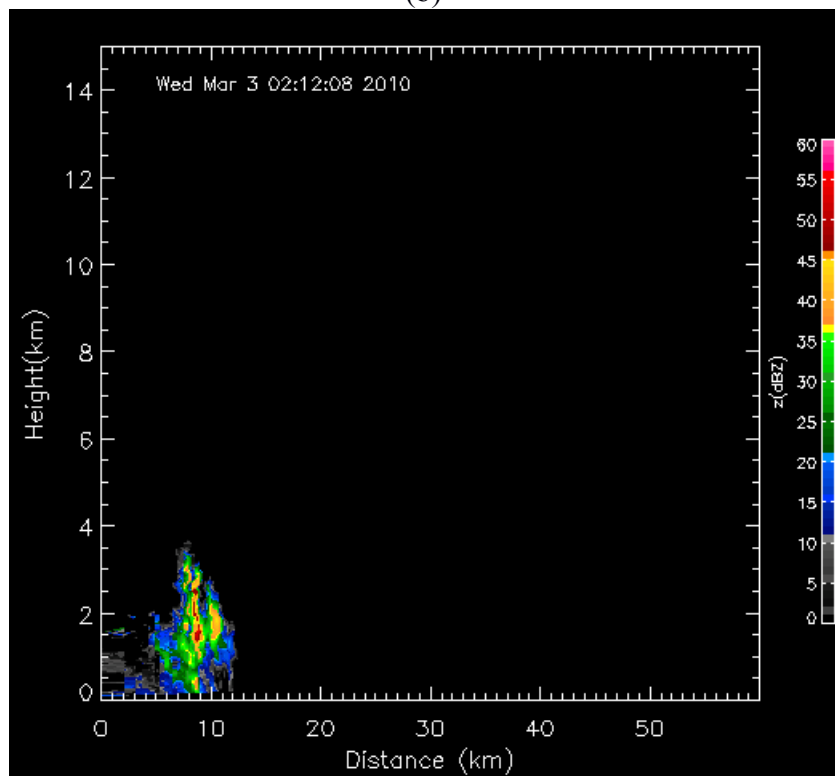


(a)

Figure 6 - RHI at 141.2° azimuth for CLA RADAR. Continue



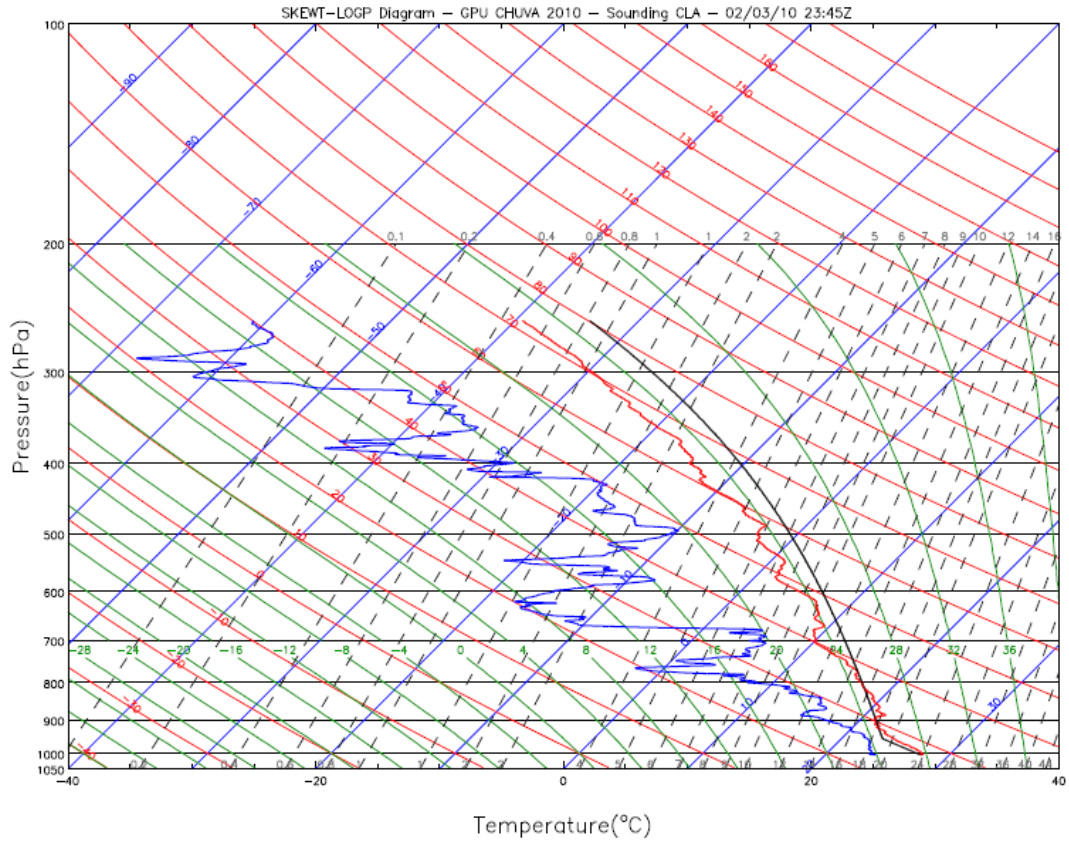
(b)



(c)

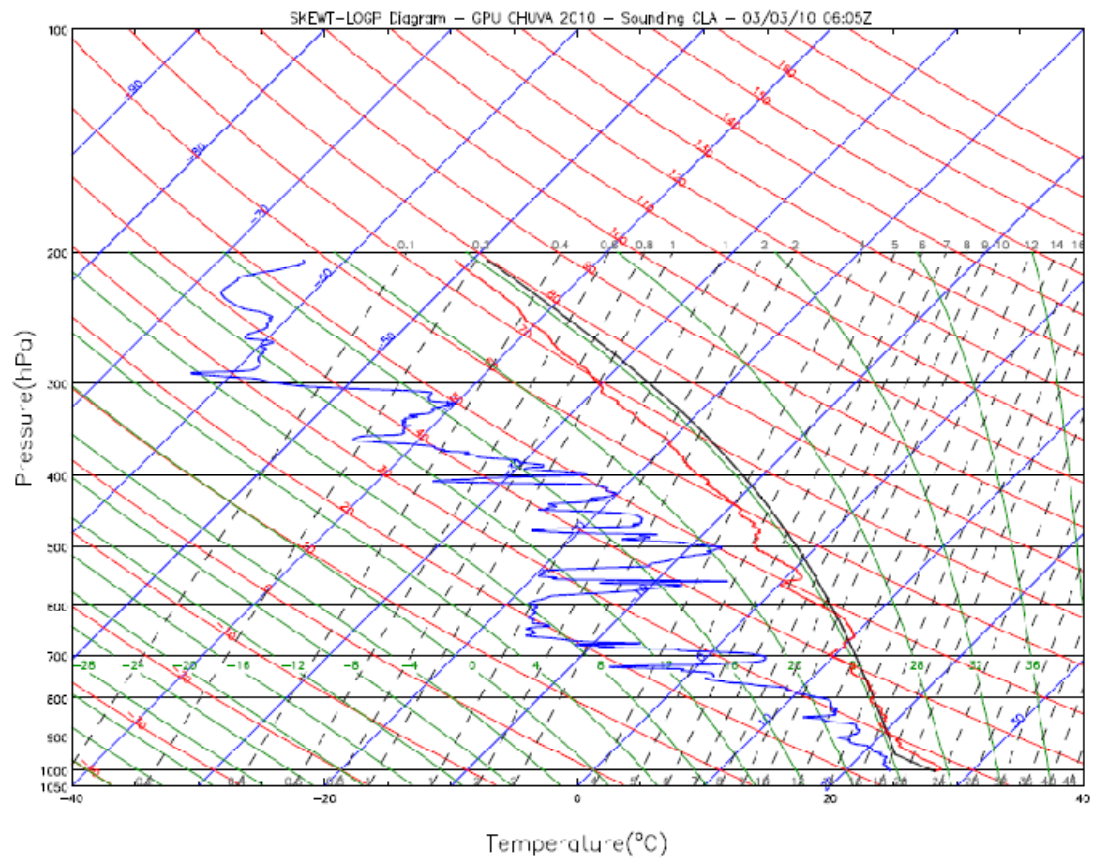
Figure 6 – Conclusion.

The instability conditions obtained by the launching of radiosondes at the Meteorological Facilities of CLA can be seen at Figure 7.

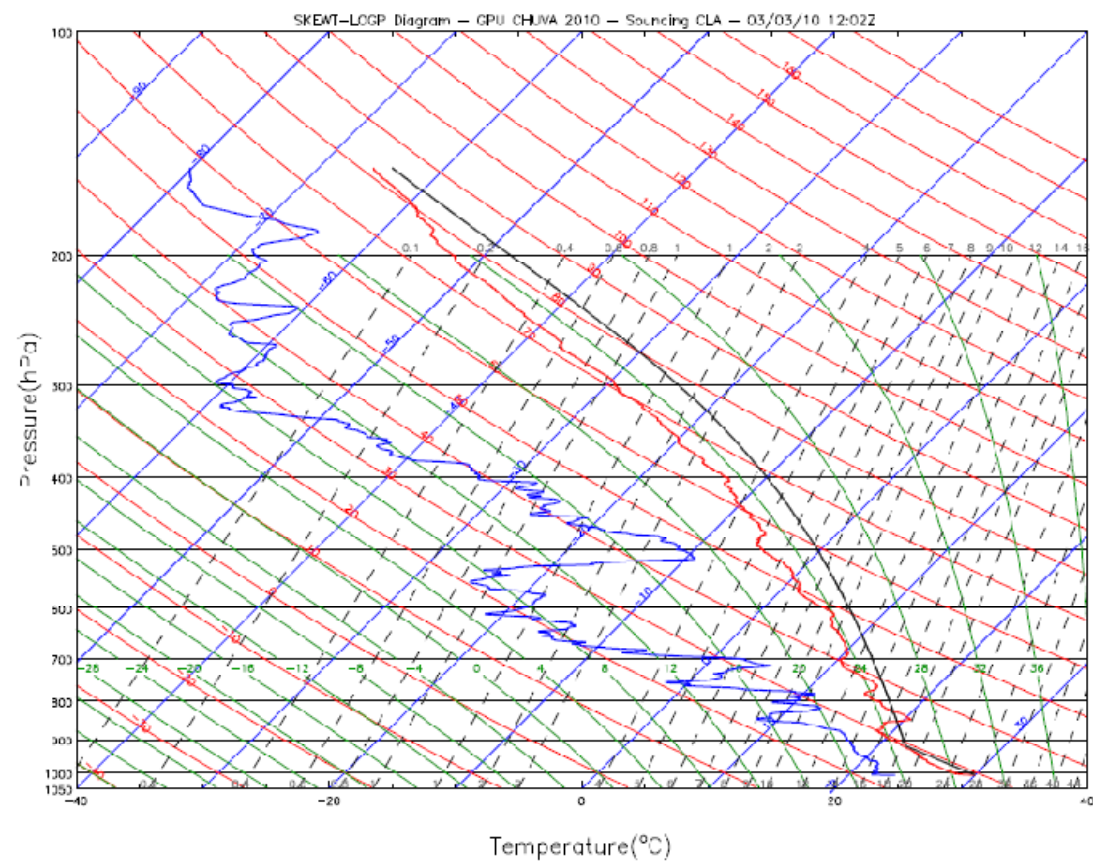


(a)

Figure 7 – Sequence of SkewT LogP diagrams for March, 3. Continue.

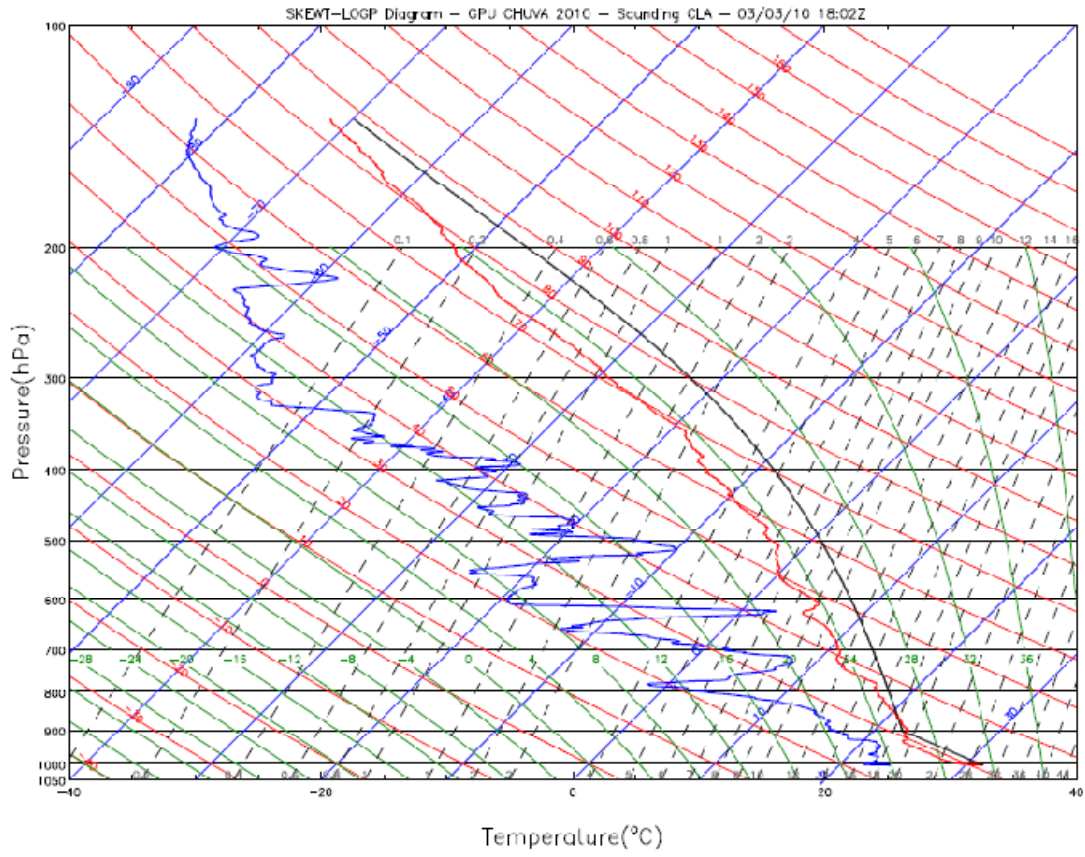


(b)



(c)

Figure 7 - Continue



(d)
Figure 7 – Conclusion.