MesoNHforC2OMODO

The RASTA-km data set



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Introduction — computing key indicators and comparisons

Overview

The measurement campaigns currently covered are: CADDIWA, HAIC-CAYENNE, HAIC-DARWIN, EXAEDRE, MAESTRO.

1. Key indicators — summary metrics
2. Radar reflectivity — comparison with the RASTA airborne 95 GHz radar
3. Infrared brightness temperature — comparison with IR at 10.8 µm
4. Microwave brightness temperature — comparison with MHS at 190.31 GHz

In the following sections, the methodology for computing each of these indicators and comparisons is described in detail, including the data processing steps, selection criteria, and mathematical formulations used to derive the final metrics.

Section 1 — Key Indicators

Convective dynamics

Indicator	Unit	Description
W max	m/s	Maximum upward vertical velocity w in the domain over the simulation period
dIWP/dt max	kg m^{-2} s^{-1}	Maximum rate of increase of column Ice Water Path over the simulation period
# convective columns	—	Number of convective columns (maximum of vertical velocity above 4 m/s and IWP > 0.1 kg m^{-2}) over the simulation period
# growing columns	—	Number of columns satisfying the `in_growth` criterion over the simulation period: the top of the ice-hydrometeor envelope must rise by at least 200 m within 4 min

Ice Water Path (IWP)

Indicator	Unit	Description
IWP cover	%	Fraction of pixels with IWP > 1 kg m^{-2} over the simulation period
IWP max	kg m^{-2}	Maximum IWP found at any grid point over the simulation period

Infrared — DCC cover (10.8 µm)

Deep Convective Cloud (DCC) coverage is estimated from brightness temperature histograms. A pixel is classified as DCC if its brightness temperature is below 230 K.

Indicator	Description
DCC cover	Mean fraction of pixels with BT < 230,K, averaged over all IR observation time steps
DCC bias	DCC_{sim} - DCC_{obs} (%)

Microwave — Icy cover (MHS 190.31 GHz)

The icy-cloud coverage is derived from the MHS 190.31 GHz channel comparison. Pixels are flagged if BT < 250K.

Indicator	Description
Icy cover	Fraction of MHS pixels with simulated BT < 250K
Icy bias	Difference in icy-pixel fraction; Icy $cover_{sim}$ - Icy $cover_{obs}$

Radar — MTR bias (RASTA 95 GHz)

Indicator	Unit	Description
MTR bias	dBZ	Mean difference of the median reflectivity profiles (simulation − observation) computed between 5 and 10 km altitude from the CFAD comparison

Infrared — Brightness temperature bias

Indicator	Unit	Description
BT bias	K	Mean difference between simulated and observed 10.8 µm brightness temperatures over the domain

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Section 2 — Radar Reflectivity (RASTA, 95 GHz)

1. Aircraft profiles where all reflectivity values are missing (no cloud/convective echo detected) are discarded. The simulation time step closest to the midpoint of the remaining valid profiles — i.e. the portion of the flight leg where convective activity is present — is selected.
2. A set of simulated columns is extracted from the Meso-NH domain, selecting convectively active columns (low BT at 10.8 µm).
3. Both observation and simulation datasets are cast into CFAD (Contoured Frequency by Altitude Diagram), normalising each altitude level by the total number of profiles.

4. The median reflectivity profile is extracted from each CFAD and the MTR bias is computed as their mean difference between 5 and 10 km altitude.

$$\mathrm{MTRbias} = \frac{1}{N} \sum_{z=5\,\mathrm{km}}^{10\,\mathrm{km}} \left(MTR_{\mathrm{sim}}(z) - MTR_{\mathrm{obs}}(z) \right) \quad [\mathrm{dBZ}]$$

Section 3 — Infrared Brightness Temperature (10.8 µm)

Spatial maps: the simulation field is the RTTOV-simulated brightness temperature interpolated onto the MSG grid. The displayed time is selected to be as close as possible to the MHS overpass time.

Brightness temperature histogram: the distribution of BT values over the domain is compared between simulation and observation. The DCC threshold of 230 K is shown as a dashed vertical line. The fraction of pixels below this threshold gives the DCC cover indicator.

$$\mathrm{DCC}_x = \frac{\sum_{BT < 230\,\mathrm{K}} n_x(BT)}{\sum_{\mathrm{all}} n_x(BT)} \times 100\,\% \quad (x \in \{\mathrm{sim},\ \mathrm{obs}\})$$

Section 4 — Microwave Brightness Temperature (190.31 GHz)

1. The Meso-NH field `MTP1_1903BT` (RTTOV-simulated BT) is interpolated onto the observed MHS grid using linear interpolation.
2. A pre-screening step checks whether the overpass contains sufficient cold pixels (< 250K) to be informative; overpasses with fewer than 5 % of such pixels are skipped.
3. Spatial comparison maps are generated for all five channels (`obs_vs_sim_*.png`).
4. For channel 4, the icy cover (fraction of pixels with BT < 250K) is computed for both observation and simulation, and their difference gives the icy bias.

$$\mathrm{Icybias} = \mathrm{Icycover}_{\mathrm{sim}} - \mathrm{Icycover}_{\mathrm{obs}} \quad [\%]$$

CADDIWA - F7

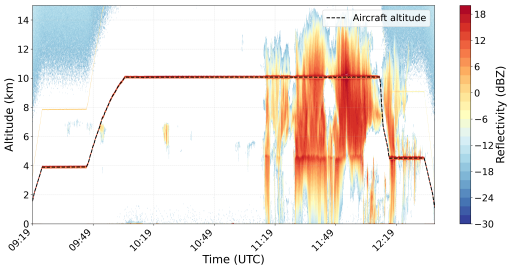
11/09/2021 08:00 ➔ 13:30

Convection type:

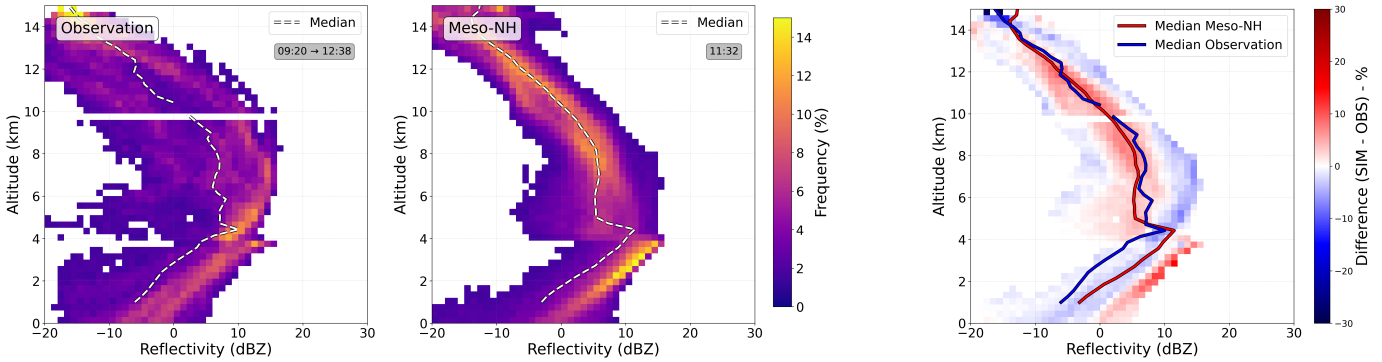
Mesoscale Convective System

1. KEY INDICATORS

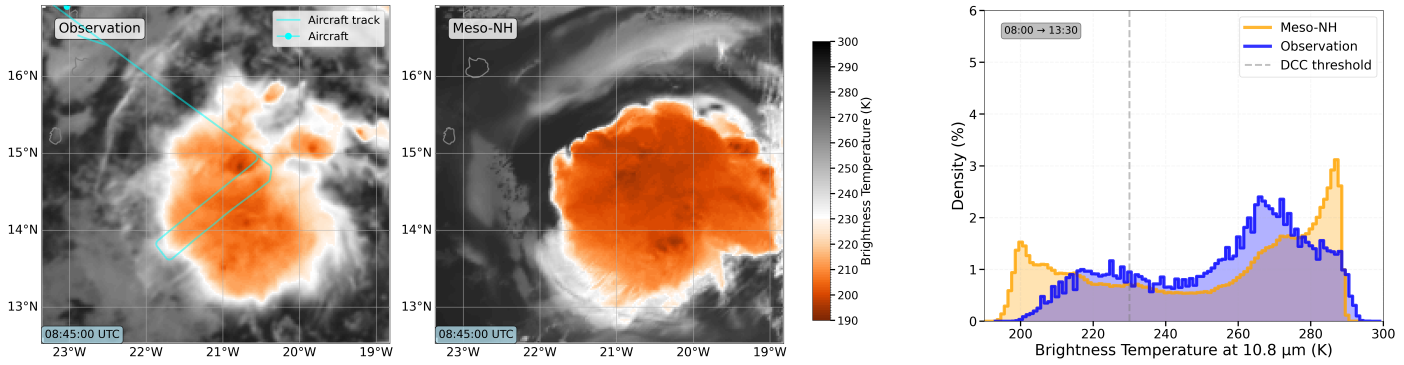
W max	**39.8 m/s**	IWP cover	**36.8%**	MTR bias	**-1.3 dBZ**
dIWP/dt max	**1.96e-01 kg/m²/s**	IWP max	**50.2 kg/m²**	BT bias	**-3.1 K**
# convec. columns	**39273**	DCC cover	**31.1%**	DCC bias	**9.4%**
# growing columns	**7416**	Icy cover	**11.7%**	Icy bias	**-4.7%**



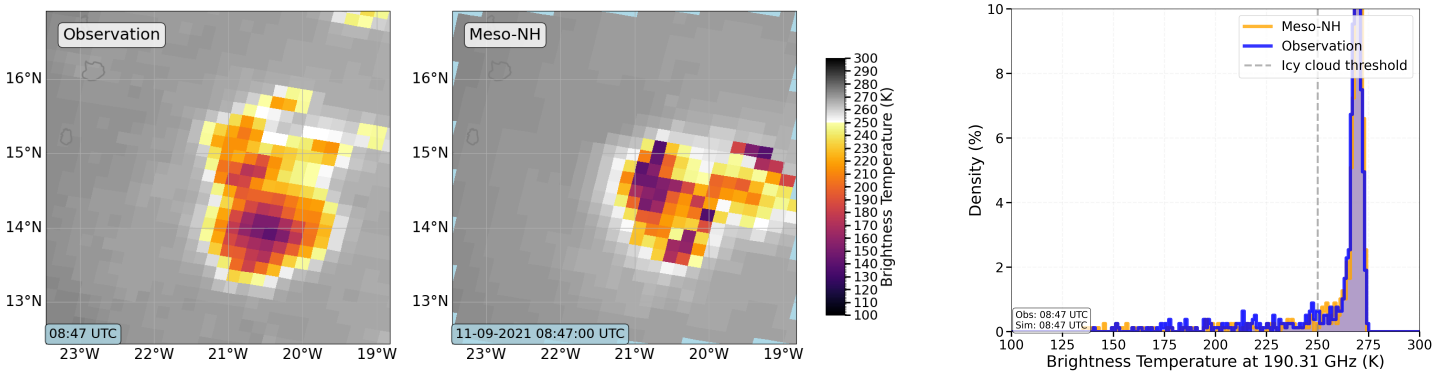
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



CADDIWA - F8

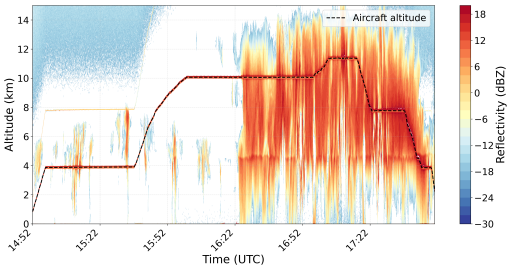
11/09/2021 13:58 → 19:28

Convection type:

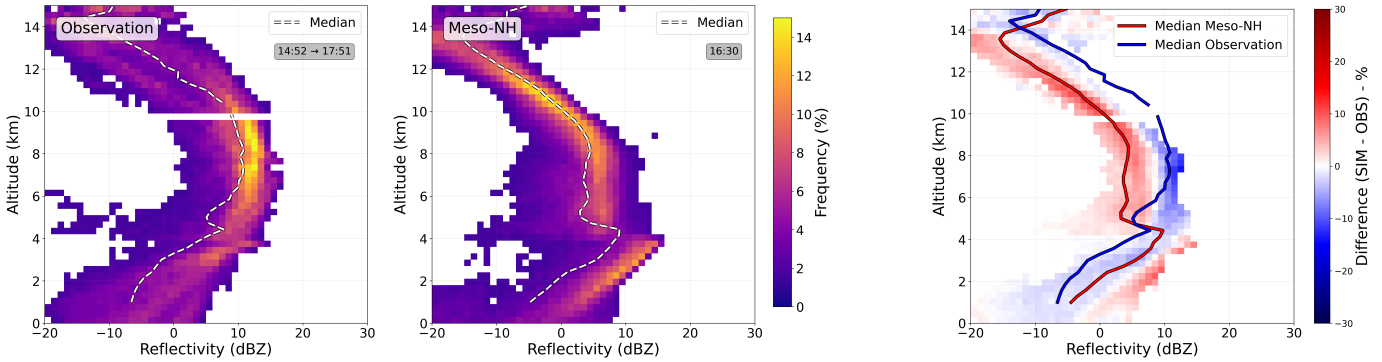
Mesoscale Convective System

1. KEY INDICATORS

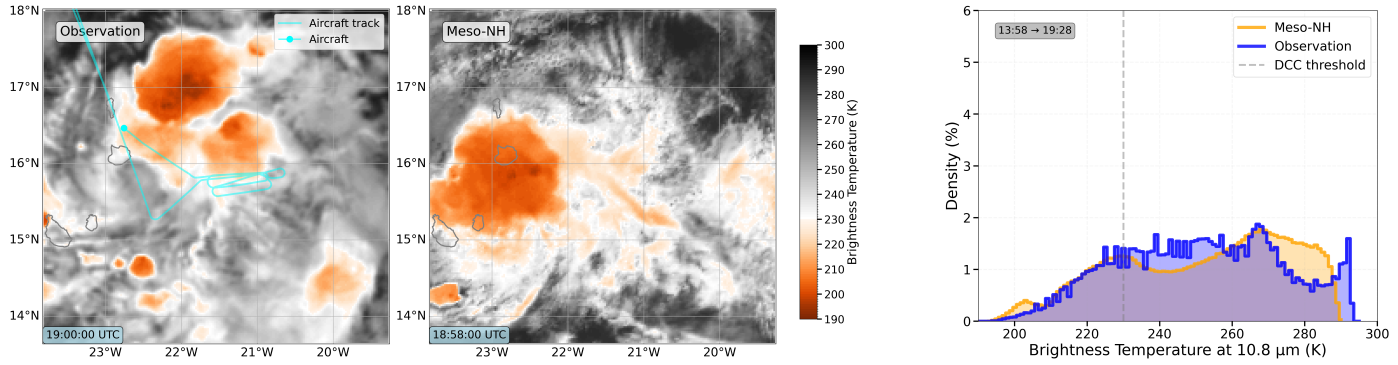
W max	**33.9 m/s**	IWP cover	**21.6%**	MTR bias	**-5.8 dBZ**
dIWP/dt max	**2.04e-01 kg/m²/s**	IWP max	**42.5 kg/m²**	BT bias	**2.3 K**
# convec. columns	**17356**	DCC cover	**22.5%**	DCC bias	**0.9%**
# growing columns	**4505**	Icy cover	**5.2%**	Icy bias	**-14.1%**



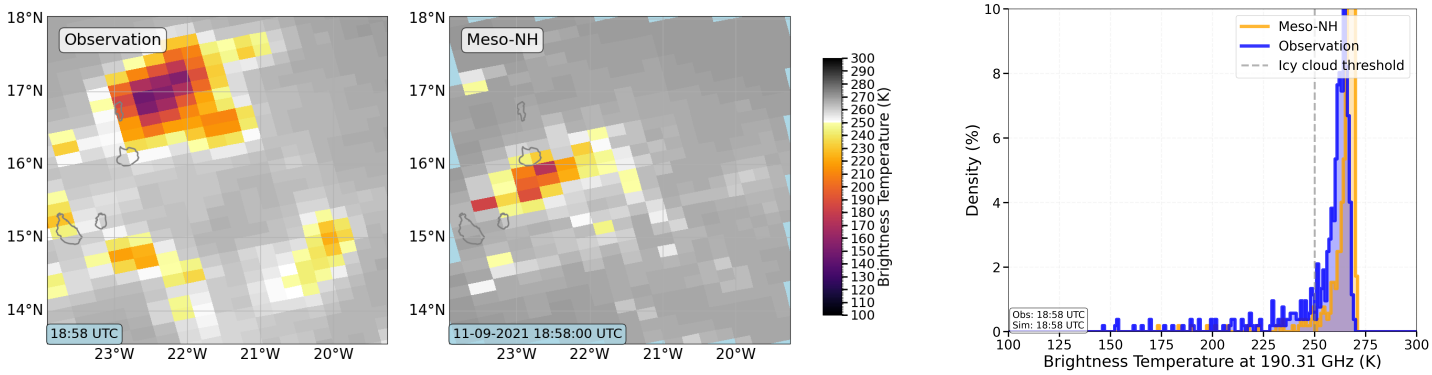
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



CADDIWA - F12

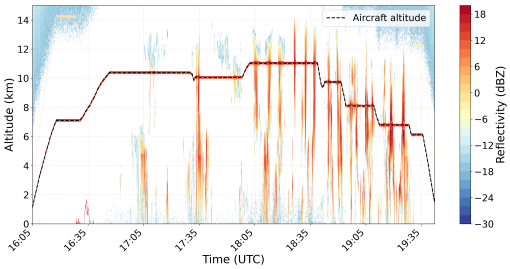
18/09/2021 15:58 → 21:28

Convection type:

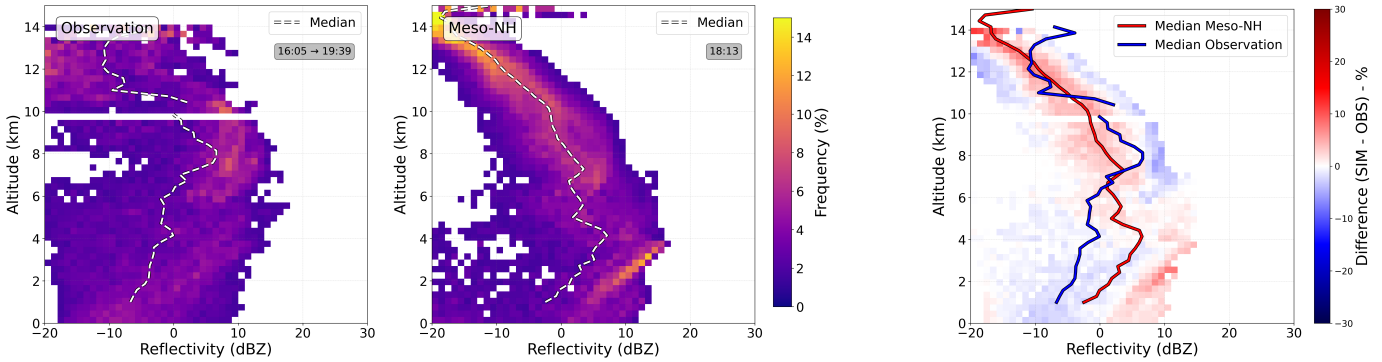
Isolated Cells

1. KEY INDICATORS

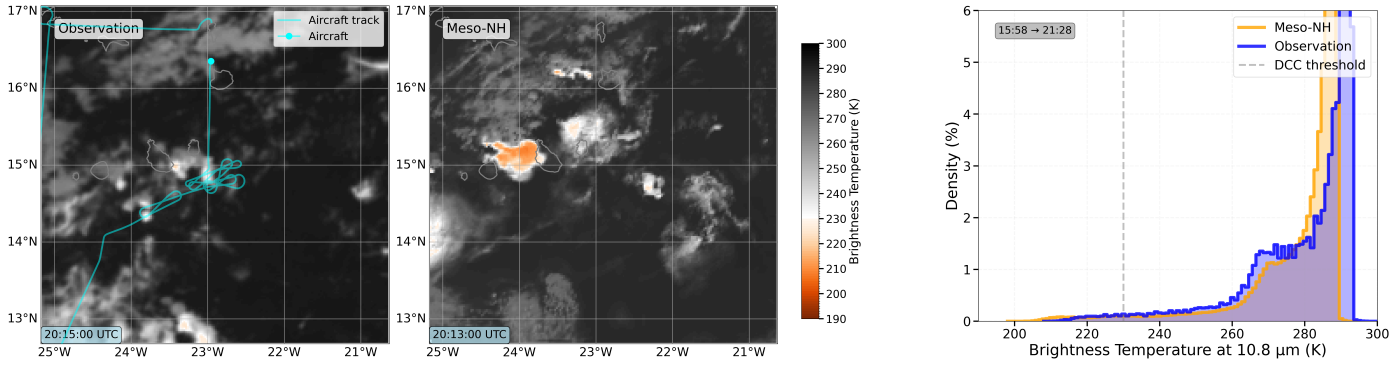
W max	**35.2 m/s**	IWP cover	**16.9%**	MTR bias	**-0.6 dBZ**
dIWP/dt max	**1.54e-01 kg/m²/s**	IWP max	**38.4 kg/m²**	BT bias	**-0.5 K**
# convec. columns	**4654**	DCC cover	**2.0%**	DCC bias	**0.4%**
# growing columns	**2325**	Icy cover	**0.3%**	Icy bias	**0.1%**



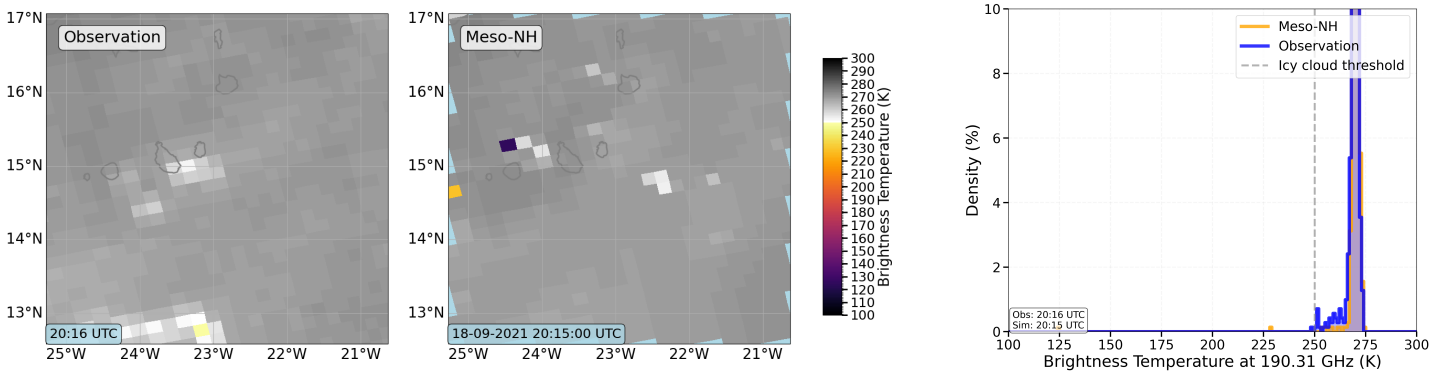
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



CADDIWA - F13

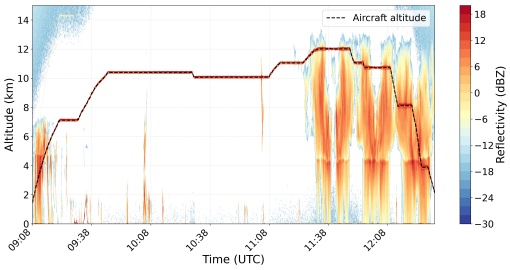
19/09/2021 08:58 → 14:28

Convection type:

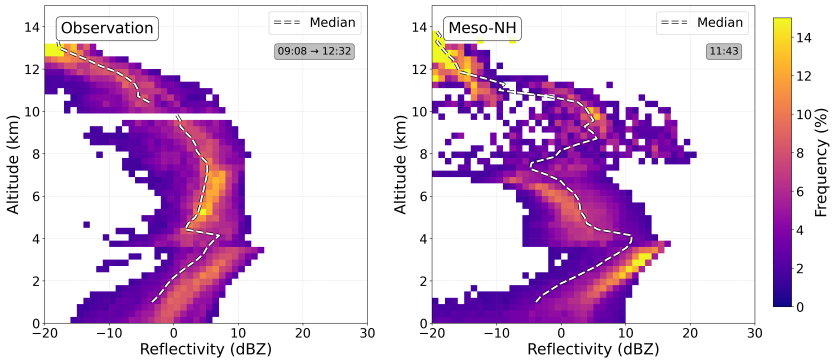
Isolated Cells

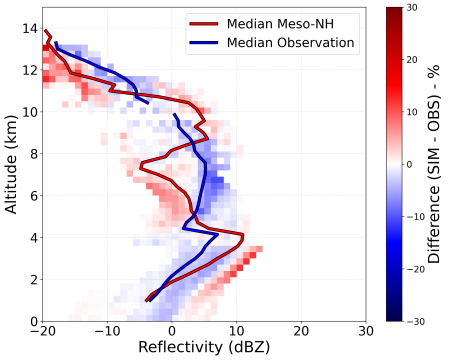
1. KEY INDICATORS

W max	**36.4 m/s**	IWP cover	**9.3%**	MTR bias	**-2.0 dBZ**
dIWP/dt max	**1.50e-01 kg/m²/s**	IWP max	**38.3 kg/m²**	BT bias	**7.9 K**
# convec. columns	**4713**	DCC cover	**0.6%**	DCC bias	**-6.5%**
# growing columns	**2531**	Icy cover	**0.0%**	Icy bias	**-13.8%**

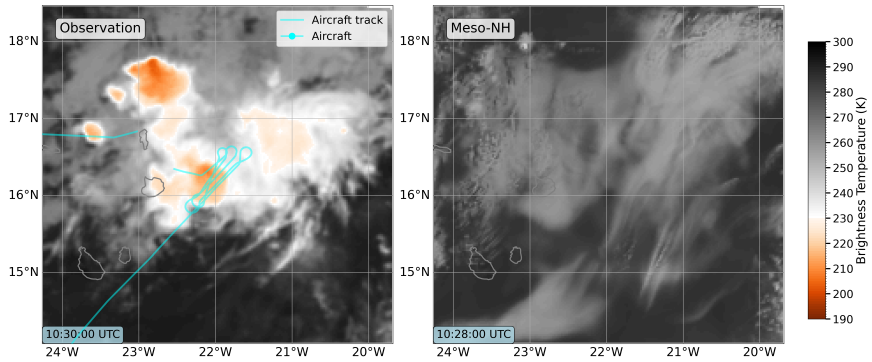


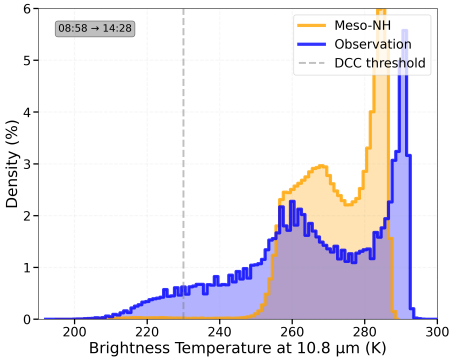
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



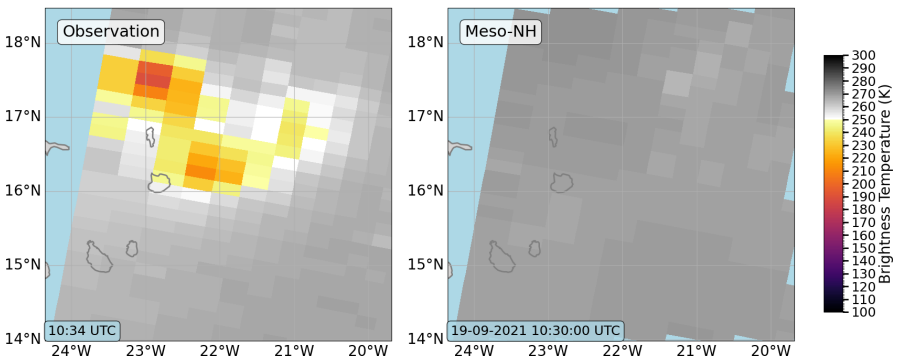


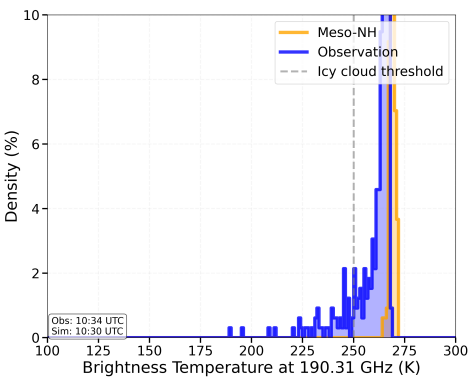
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-CAYENNE - F10

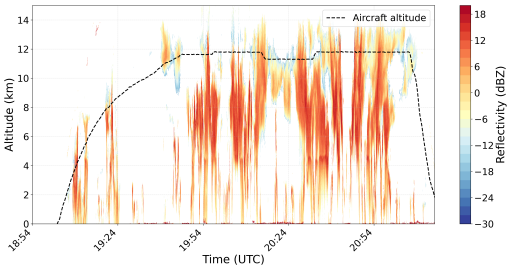
10/05/2015 18:28 → 23:58

Convection type:

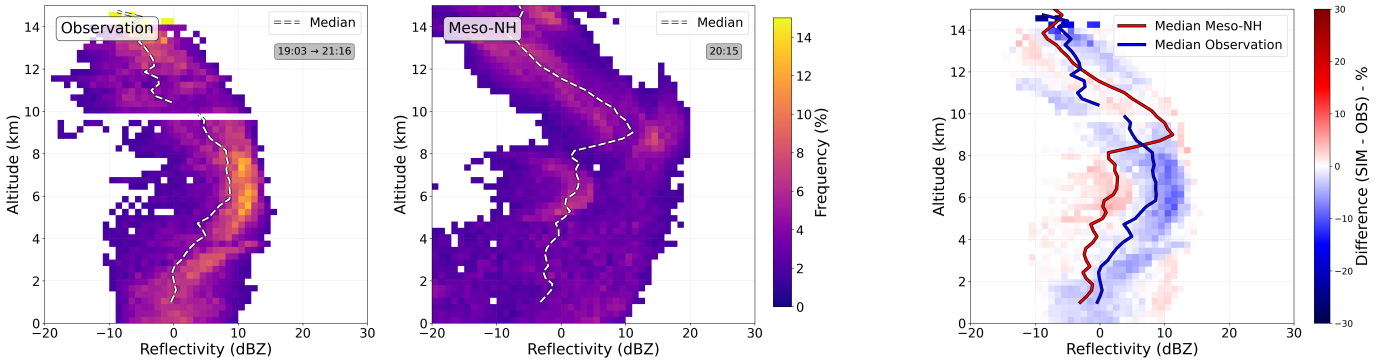
Isolated Cells

1. KEY INDICATORS

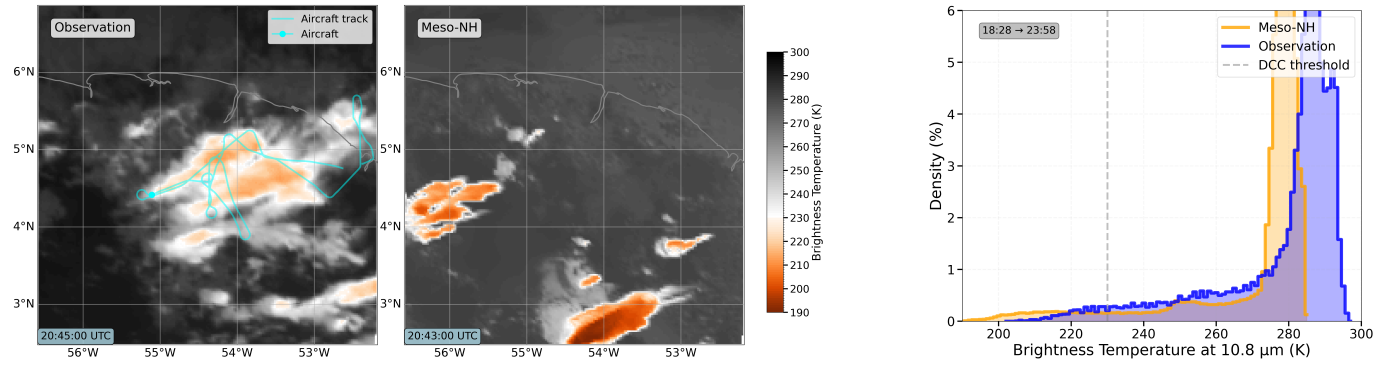
W max	**40.9 m/s**	IWP cover	**26.3%**	MTR bias	**-2.7 dBZ**
dIWP/dt max	**2.73e-01 kg/m²/s**	IWP max	**42.5 kg/m²**	BT bias	**-4.9 K**
# convec. columns	**13042**	DCC cover	**5.6%**	DCC bias	**2.2%**
# growing columns	**7680**	Icy cover	**3.6%**	Icy bias	**-3.9%**



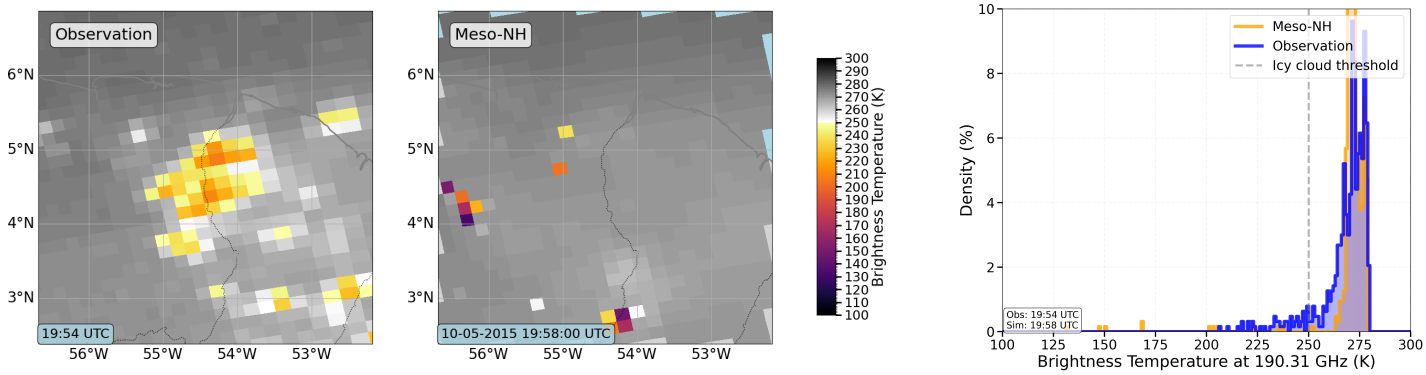
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F11

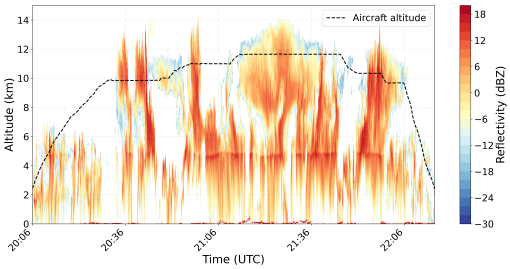
12/05/2015 18:28 → 23:58

Convection type:

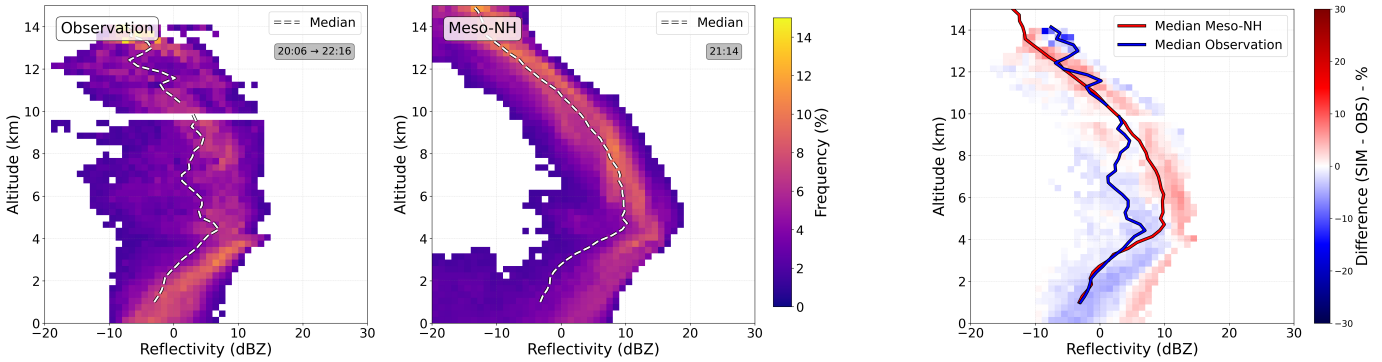
Isolated Cells

1. KEY INDICATORS

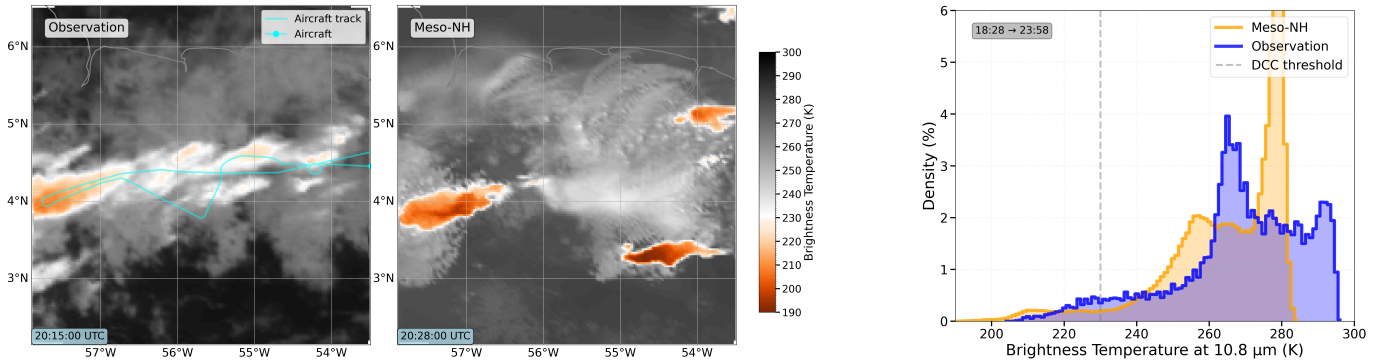
W max	**32.2 m/s**	IWP cover	**22.5%**	MTR bias	**4.4 dBZ**
dIWP/dt max	**1.40e-01 kg/m²/s**	IWP max	**33.9 kg/m²**	BT bias	**-3.6 K**
# convec. columns	**22688**	DCC cover	**5.3%**	DCC bias	**0.6%**
# growing columns	**10140**	Icy cover	**2.8%**	Icy bias	**-1.7%**



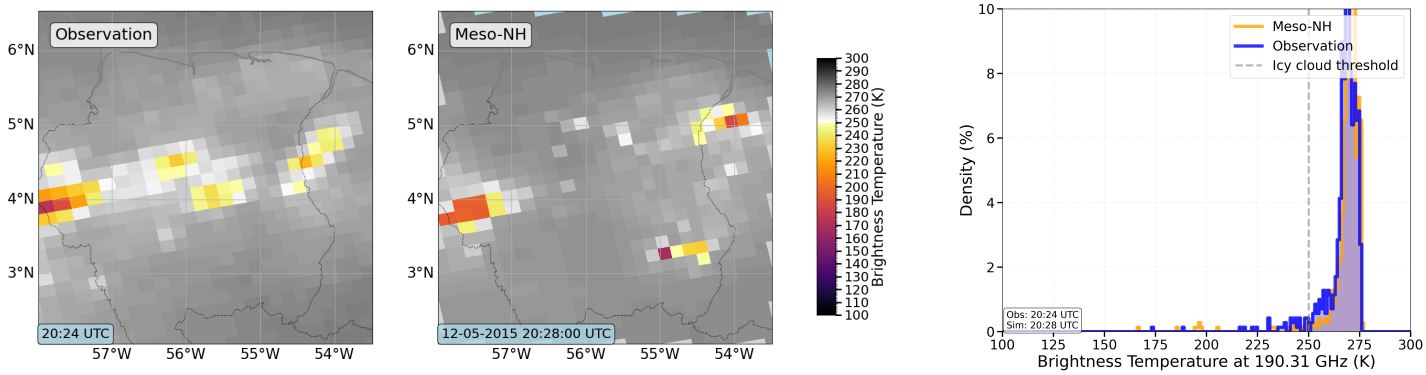
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F12

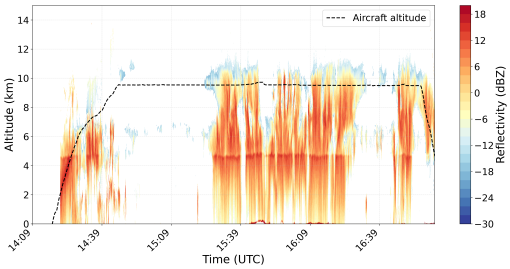
14/05/2015 13:00 ➔ 18:30

Convection type:

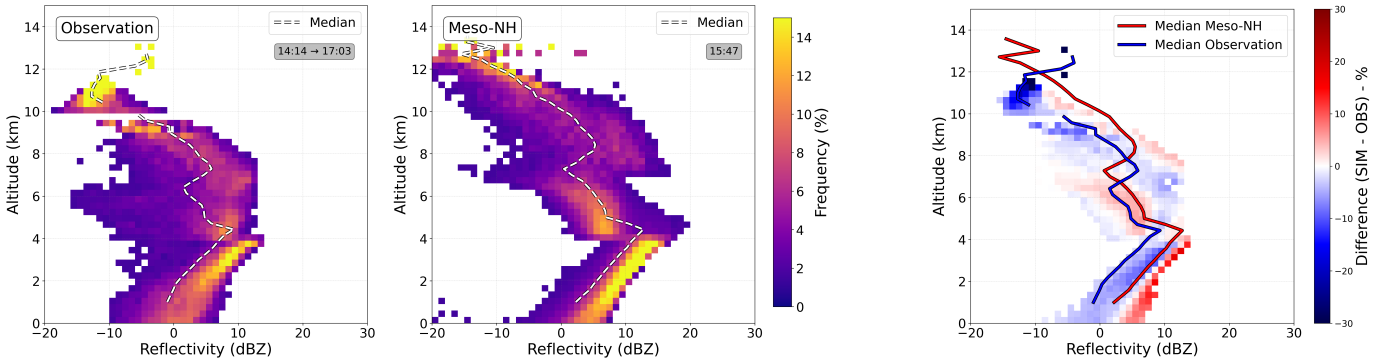
Mesoscale Convective System

1. KEY INDICATORS

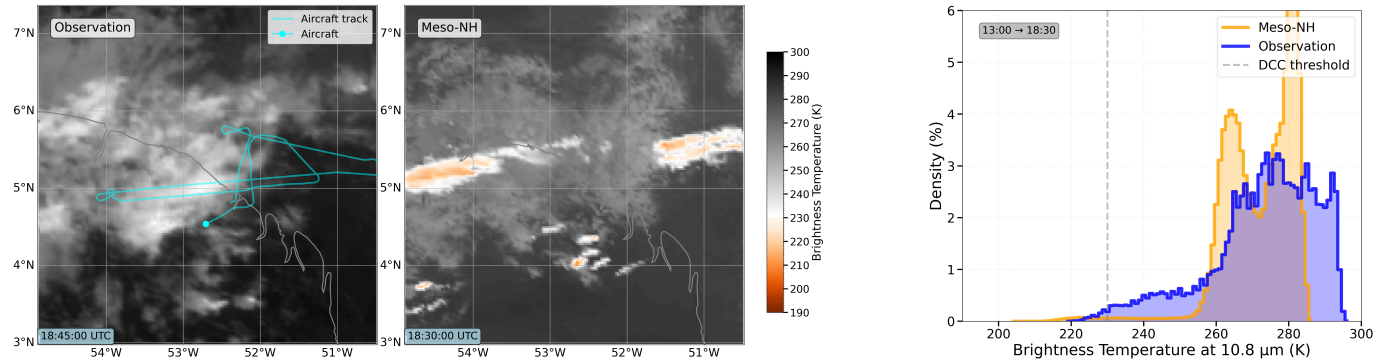
W max	**24.5 m/s**	IWP cover	**7.8%**	MTR bias	**1.9 dBZ**
dIWP/dt max	**7.72e-02 kg/m²/s**	IWP max	**30.1 kg/m²**	BT bias	**-0.4 K**
# convec. columns	**6649**	DCC cover	**1.0%**	DCC bias	**0.1%**
# growing columns	**3854**	Icy cover	**1.1%**	Icy bias	**-1.5%**



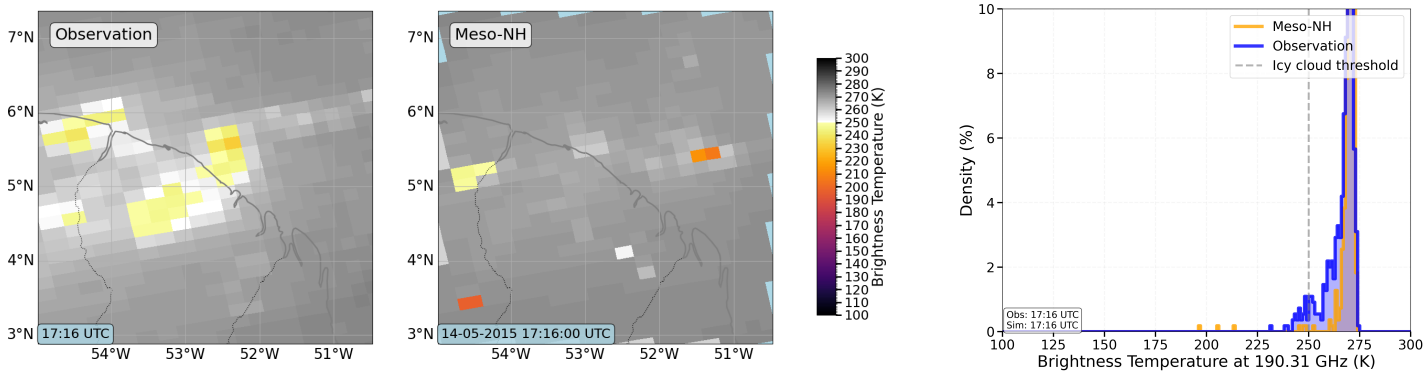
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F13

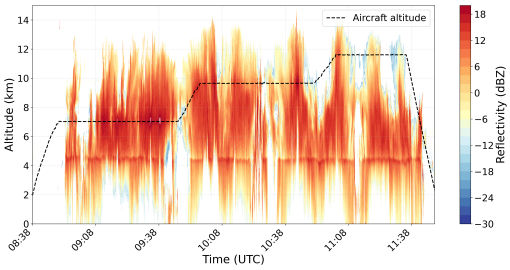
15/05/2015 07:00 ➔ 12:30

Convection type:

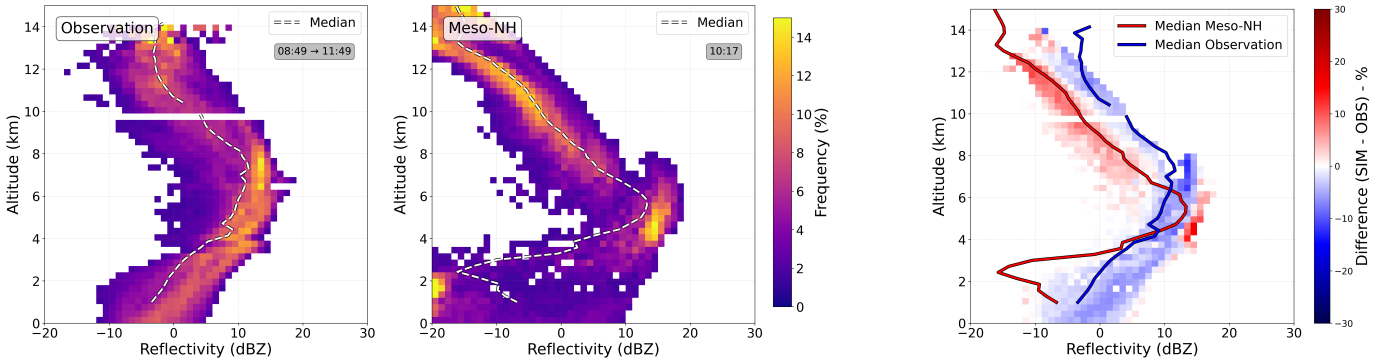
Mesoscale Convective System

1. KEY INDICATORS

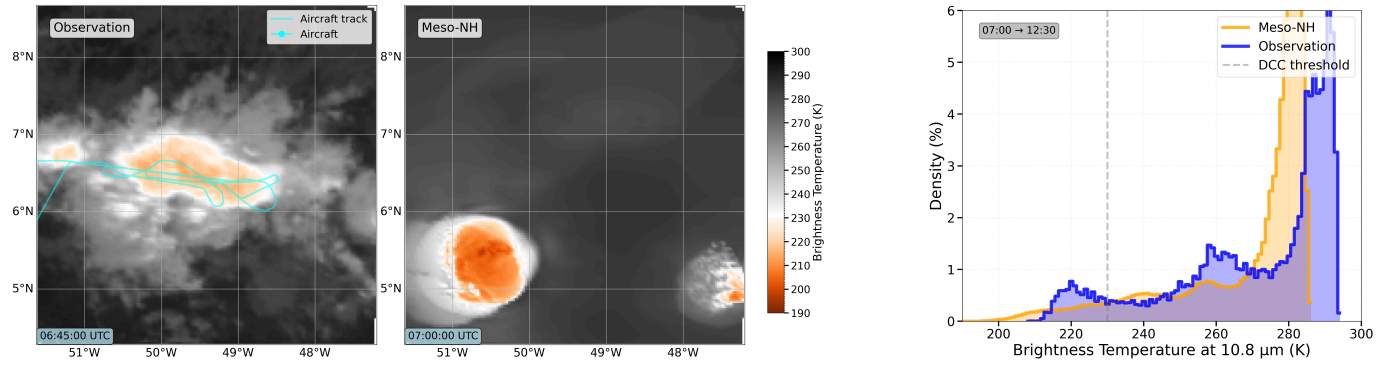
W max	**33.4 m/s**	IWP cover	**26.0%**	MTR bias	**-3.1 dBZ**
dIWP/dt max	**1.10e-01 kg/m²/s**	IWP max	**41.5 kg/m²**	BT bias	**-1.0 K**
# convec. columns	**12348**	DCC cover	**6.6%**	DCC bias	**-2.6%**
# growing columns	**5342**	Icy cover	**6.2%**	Icy bias	**-0.0%**



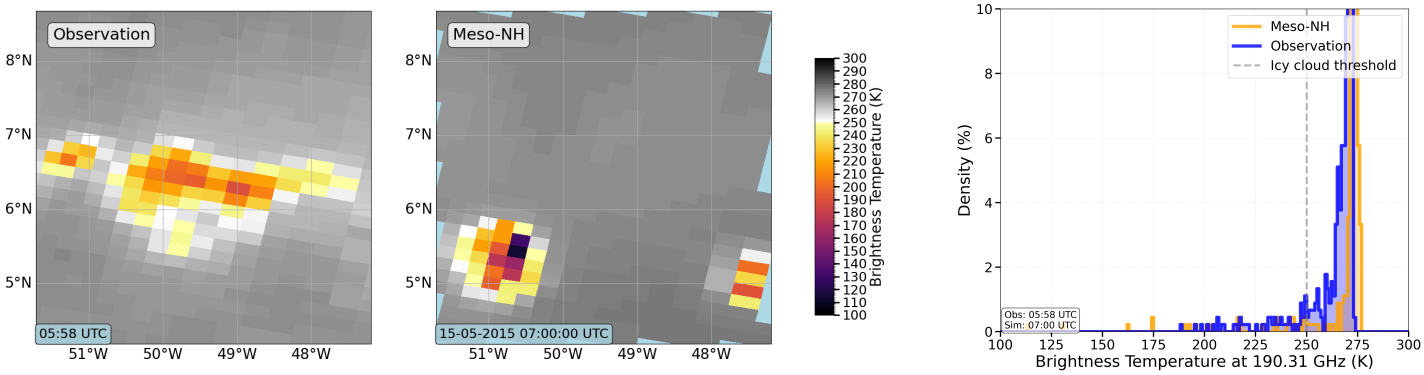
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F14

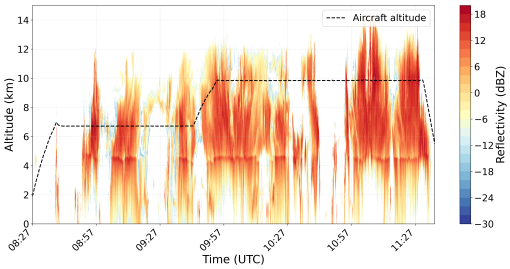
16/05/2015 07:00 ➔ 12:30

Convection type:

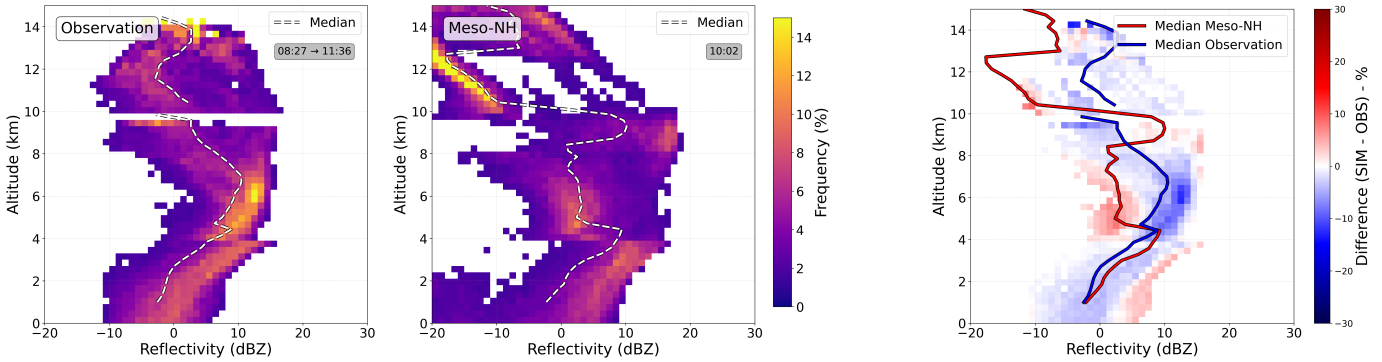
Mesoscale Convective System

1. KEY INDICATORS

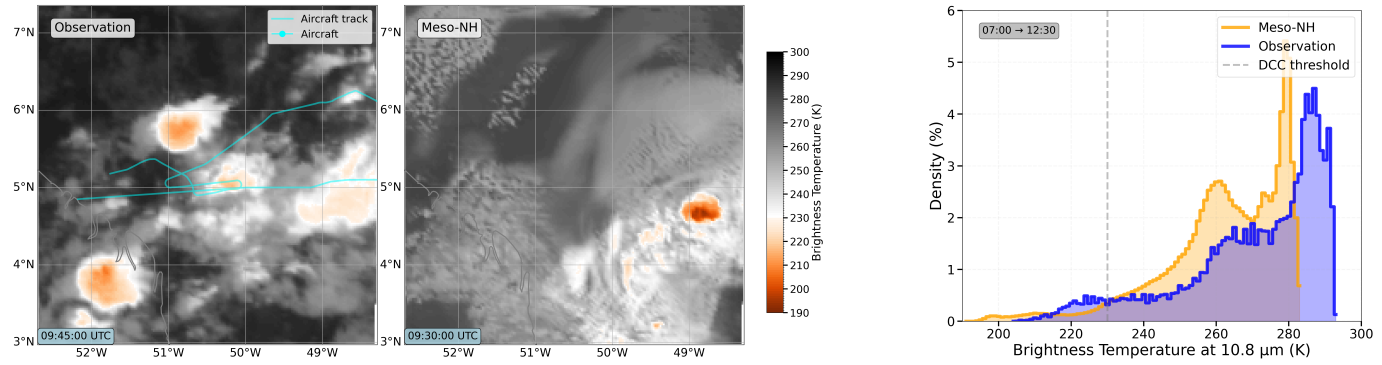
W max	**35.0 m/s**	IWP cover	**11.6%**	MTR bias	**-2.6 dBZ**
dIWP/dt max	**1.31e-01 kg/m²/s**	IWP max	**41.4 kg/m²**	BT bias	**-8.1 K**
# convec. columns	**17947**	DCC cover	**5.0%**	DCC bias	**-0.7%**
# growing columns	**7202**	Icy cover	**7.2%**	Icy bias	**-2.1%**



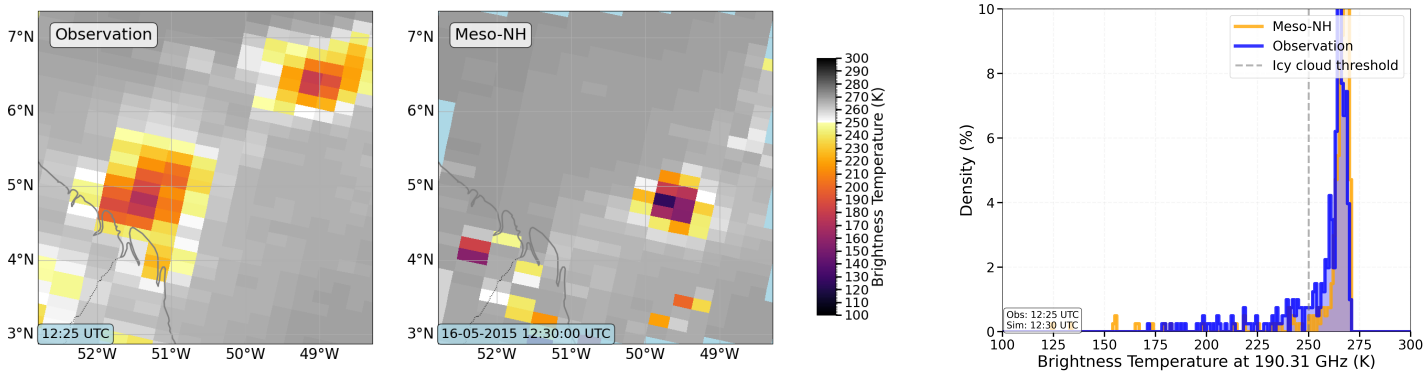
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F15

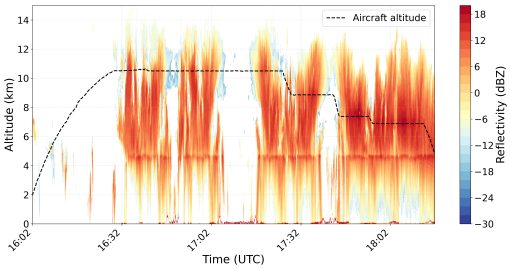
16/05/2015 15:00 → 20:30

Convection type:

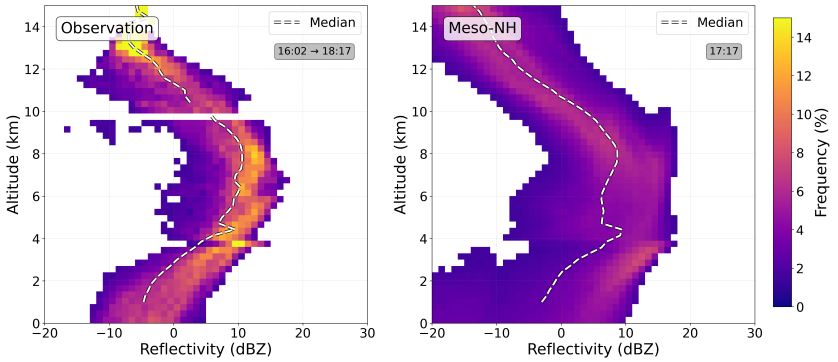
Mesoscale Convective System

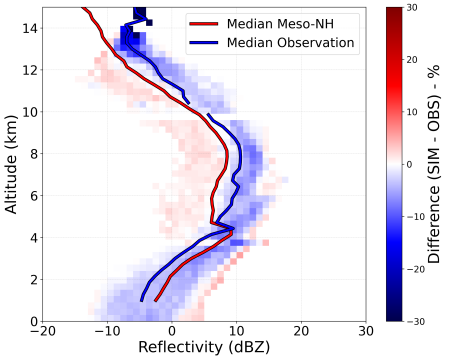
1. KEY INDICATORS

W max	**48.5 m/s**	IWP cover	**38.7%**	MTR bias	**-2.2 dBZ**
dIWP/dt max	**2.36e-01 kg/m²/s**	IWP max	**54.4 kg/m²**	BT bias	**-14.7 K**
# convec. columns	**130378**	DCC cover	**42.1%**	DCC bias	**17.7%**
# growing columns	**46193**	Icy cover	**40.0%**	Icy bias	**-17.4%**

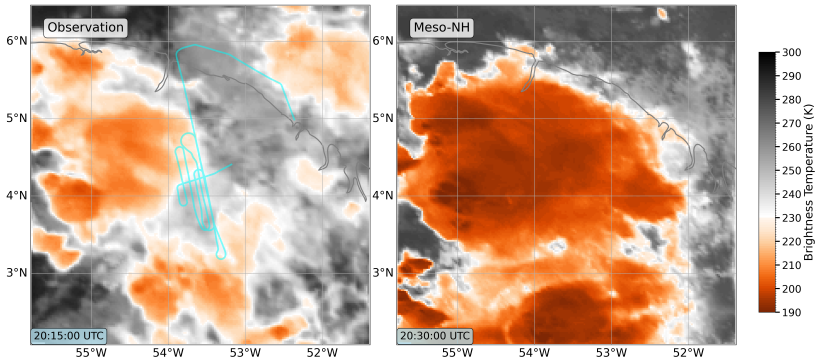


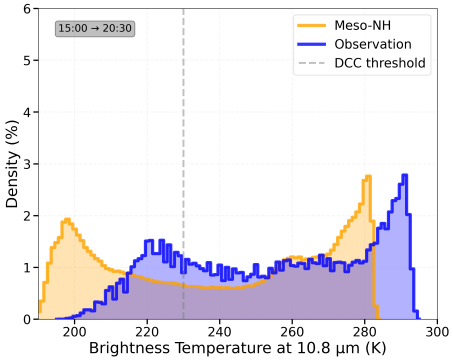
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



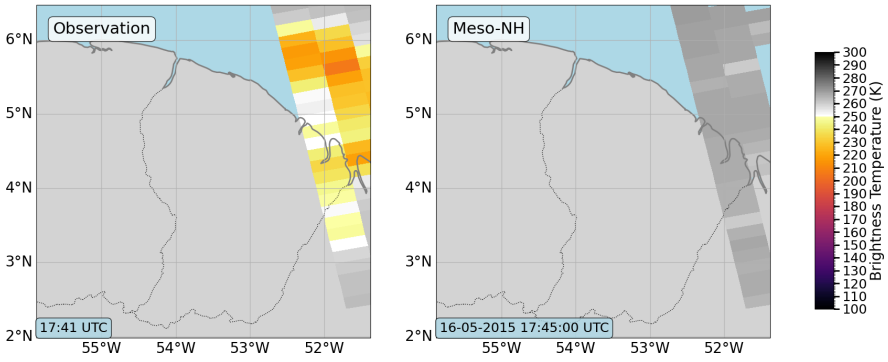


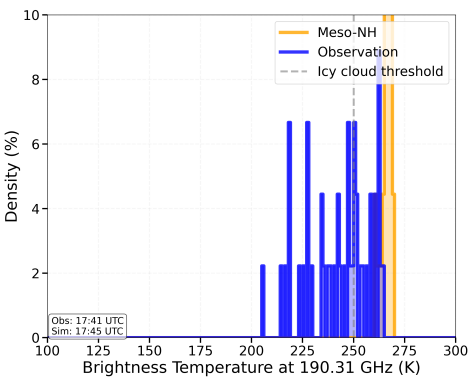
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-CAYENNE - F16

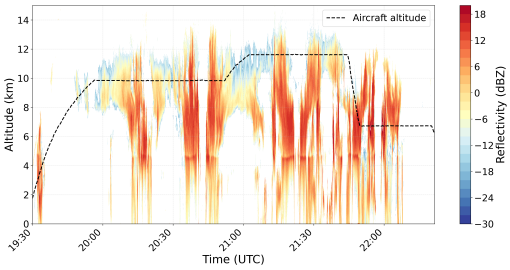
18/05/2015 18:28 → 23:58

Convection type:

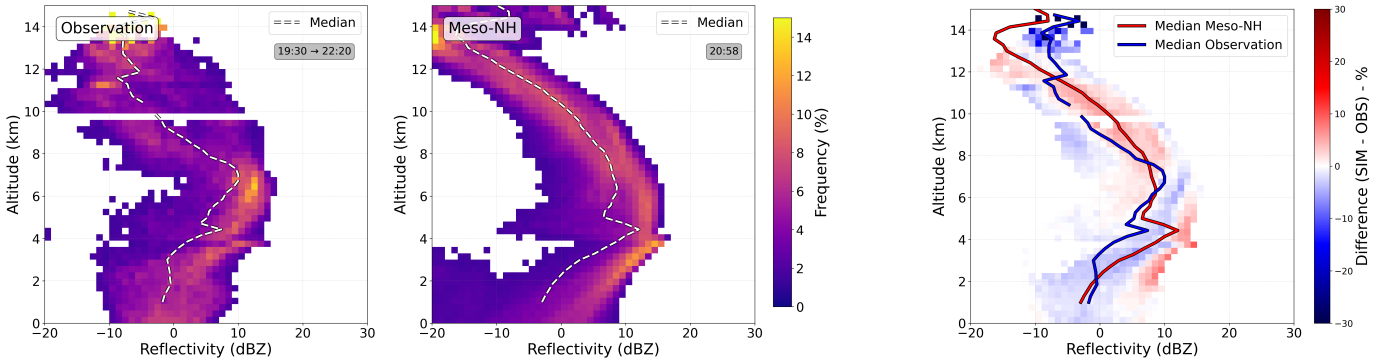
Mesoscale Convective System

1. KEY INDICATORS

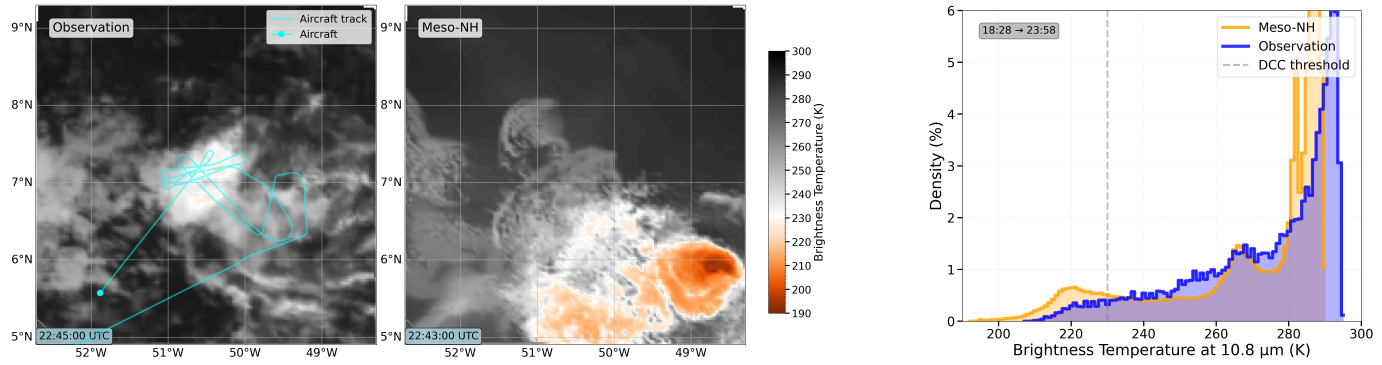
W max	**34.0 m/s**	IWP cover	**27.5%**	MTR bias	**1.4 dBZ**
dIWP/dt max	**1.30e-01 kg/m²/s**	IWP max	**43.1 kg/m²**	BT bias	**-3.4 K**
# convec. columns	**10706**	DCC cover	**11.0%**	DCC bias	**6.2%**
# growing columns	**3889**	Icy cover	**2.6%**	Icy bias	**-2.6%**



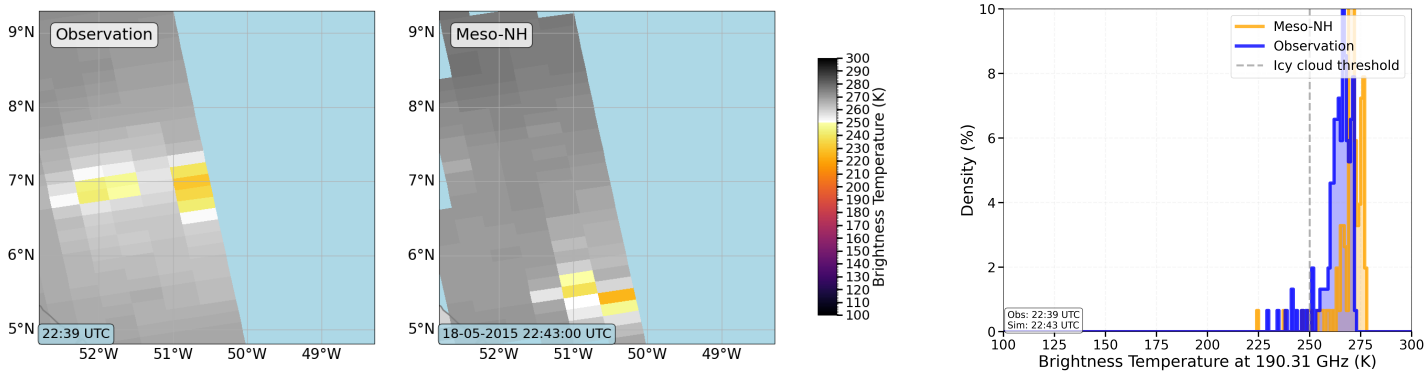
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F17

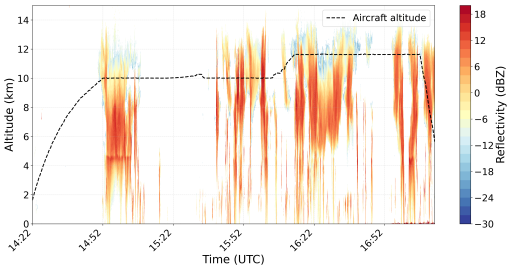
19/05/2015 12:58 → 18:28

Convection type:

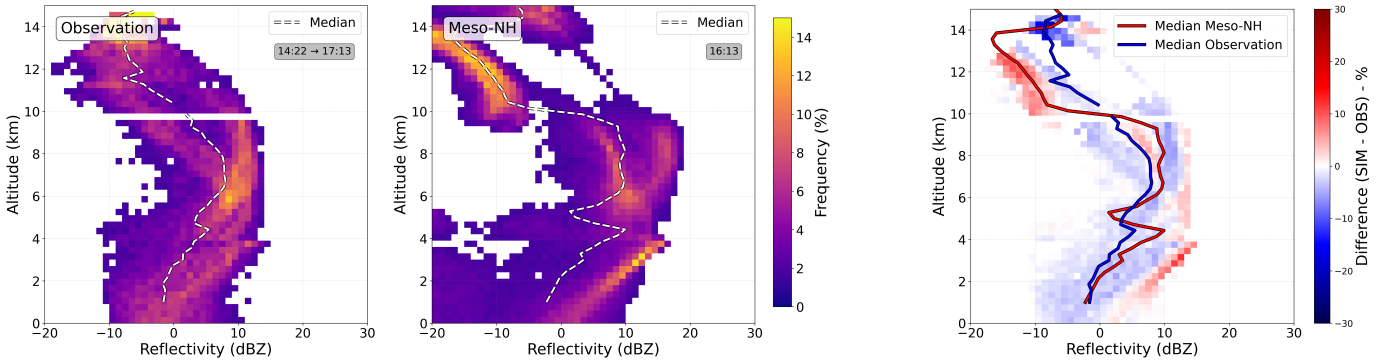
Mesoscale Convective System

1. KEY INDICATORS

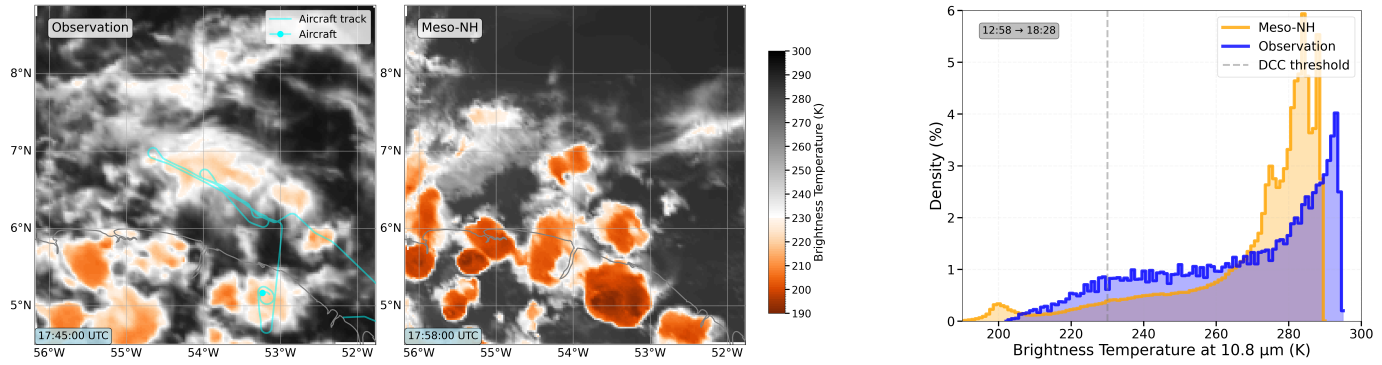
W max	**48.1 m/s**	IWP cover	**29.2%**	MTR bias	**1.8 dBZ**
dIWP/dt max	**2.58e-01 kg/m²/s**	IWP max	**53.4 kg/m²**	BT bias	**4.1 K**
# convec. columns	**15026**	DCC cover	**8.0%**	DCC bias	**-2.6%**
# growing columns	**6366**	Icy cover	**4.9%**	Icy bias	**-0.7%**



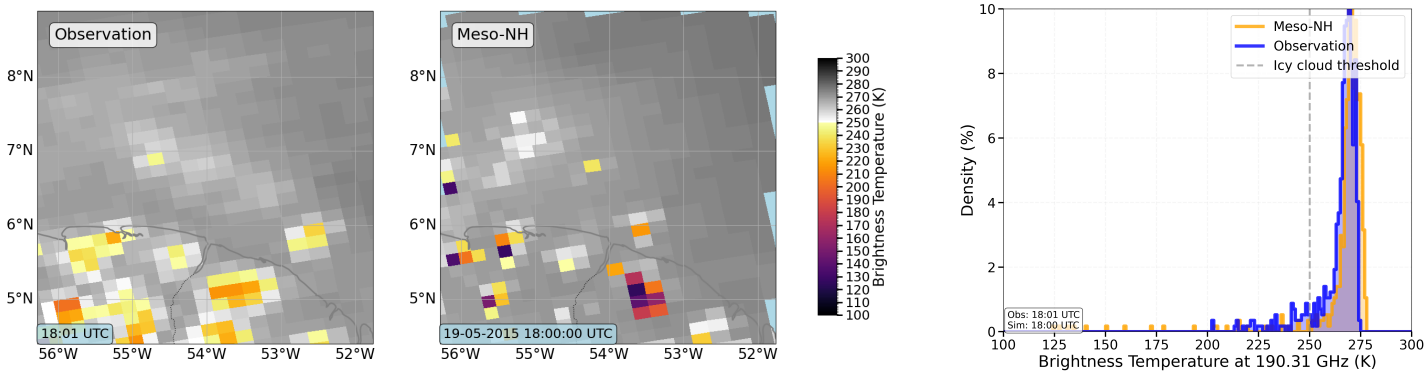
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F18

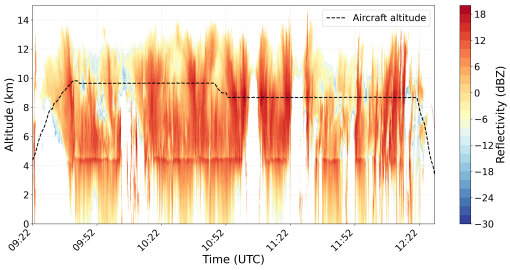
23/05/2015 07:58 ➔ 13:28

Convection type:

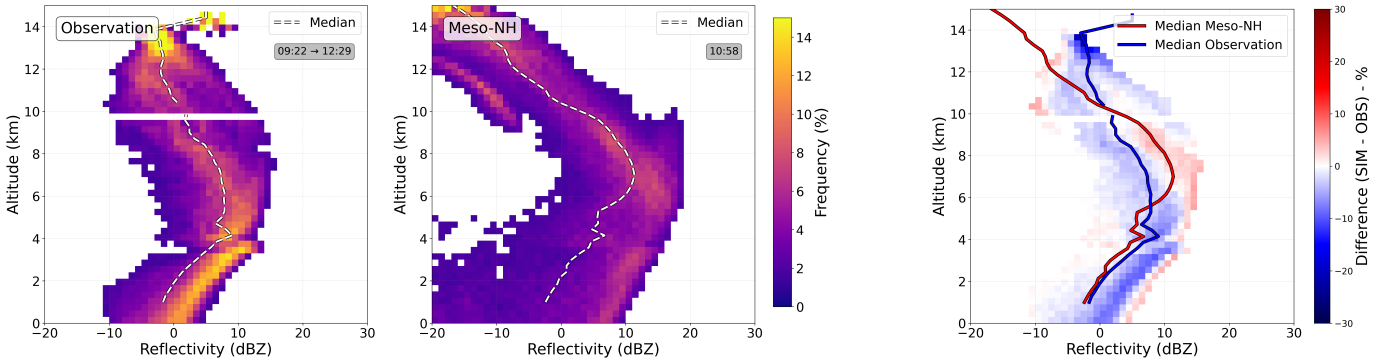
Mesoscale Convective System

1. KEY INDICATORS

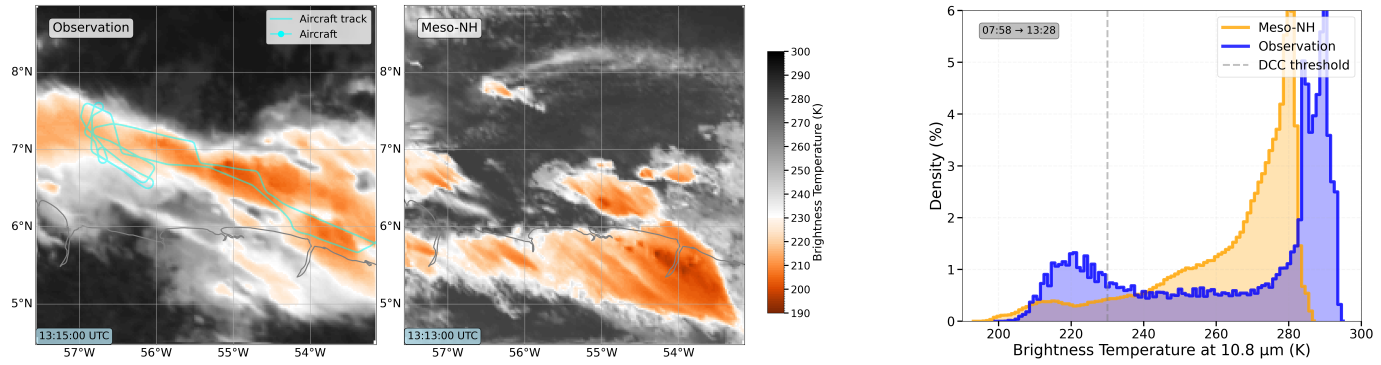
W max	**36.4 m/s**	IWP cover	**29.6%**	MTR bias	**3.0 dBZ**
dIWP/dt max	**2.20e-01 kg/m²/s**	IWP max	**46.2 kg/m²**	BT bias	**-0.7 K**
# convec. columns	**29018**	DCC cover	**9.6%**	DCC bias	**-11.1%**
# growing columns	**11657**	Icy cover	**13.7%**	Icy bias	**-0.4%**



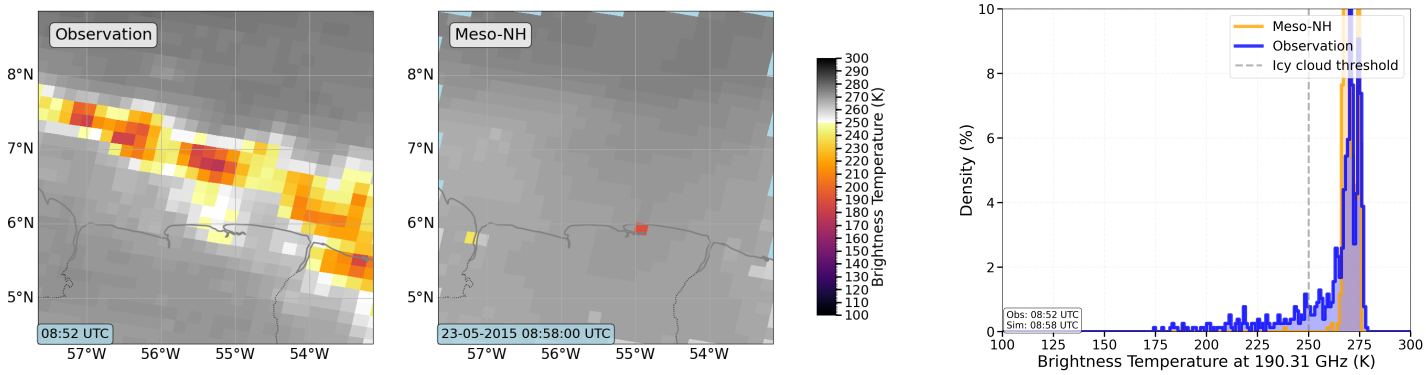
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F19

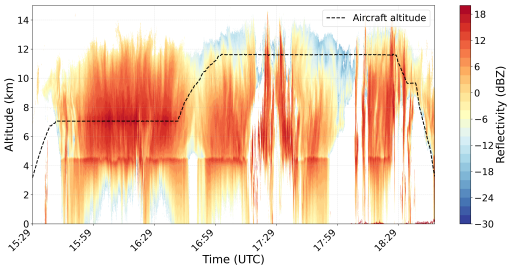
23/05/2015 13:58 → 19:28

Convection type:

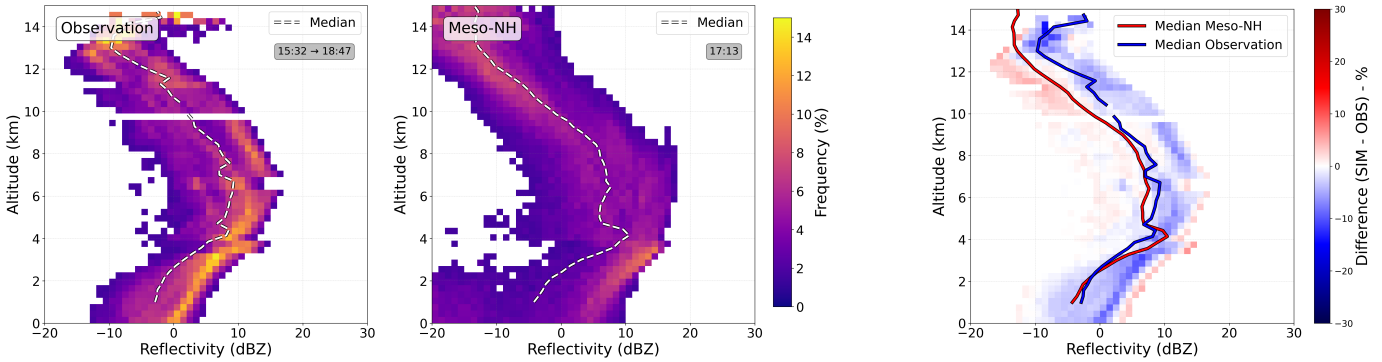
Mesoscale Convective System

1. KEY INDICATORS

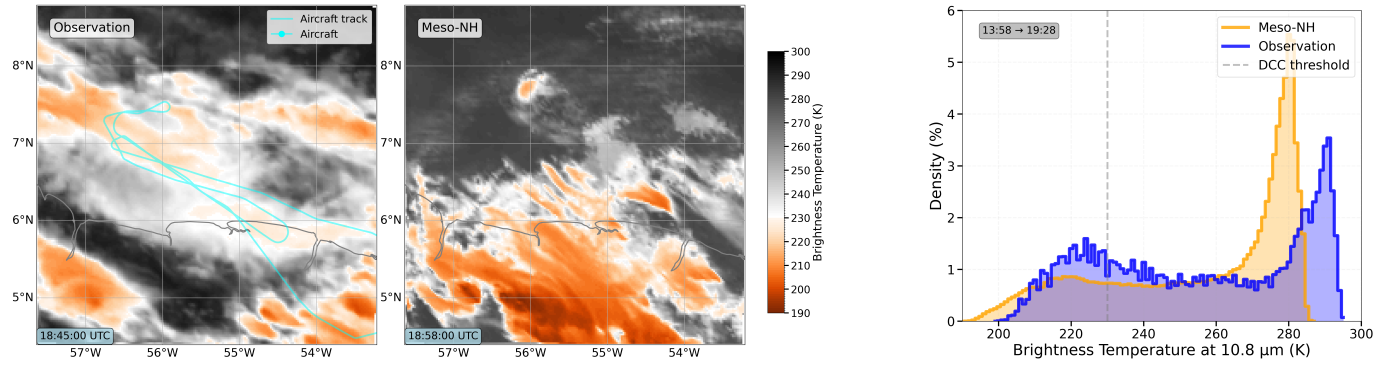
W max	**44.4 m/s**	IWP cover	**28.2%**	MTR bias	**-1.7 dBZ**
dIWP/dt max	**3.28e-01 kg/m²/s**	IWP max	**47.2 kg/m²**	BT bias	**1.1 K**
# convec. columns	**41929**	DCC cover	**22.1%**	DCC bias	**-3.9%**
# growing columns	**17642**	Icy cover	**8.5%**	Icy bias	**-10.0%**



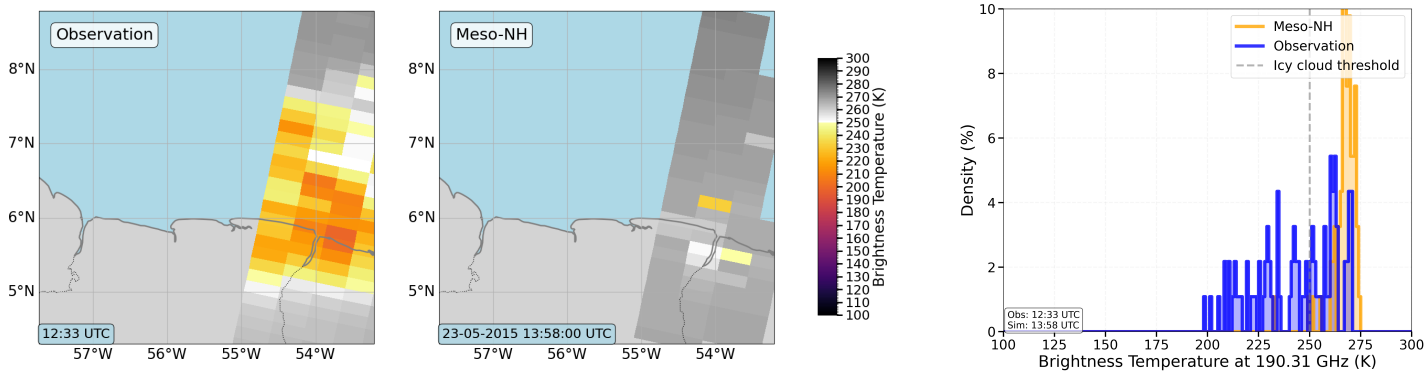
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F20

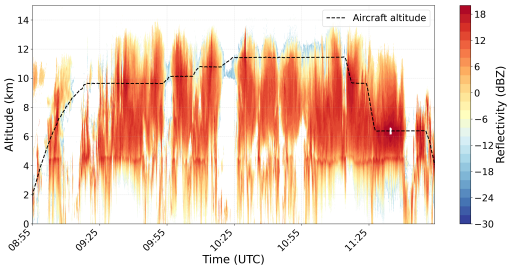
24/05/2015 06:58 ➔ 12:28

Convection type:

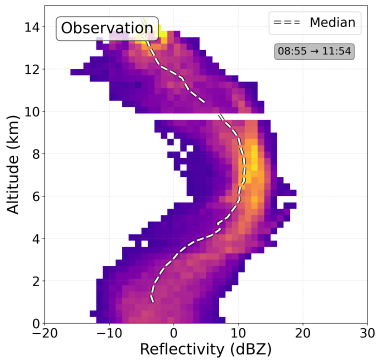
Mesoscale Convective System

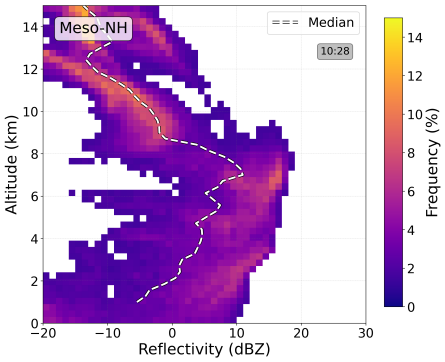
1. KEY INDICATORS

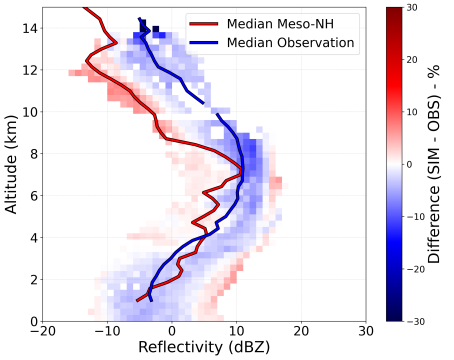
W max	**41.7 m/s**	IWP cover	**13.1%**	MTR bias	**-5.0 dBZ**
dIWP/dt max	**2.59e-01 kg/m²/s**	IWP max	**45.0 kg/m²**	BT bias	**-7.0 K**
# convec. columns	**10505**	DCC cover	**10.9%**	DCC bias	**-2.9%**
# growing columns	**4236**	Icy cover	**2.7%**	Icy bias	**-7.8%**



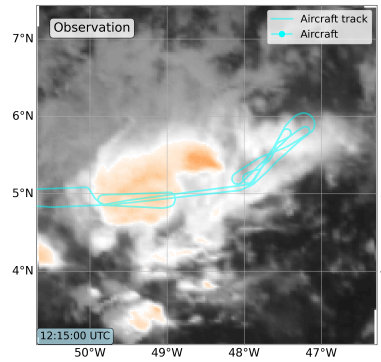
2. RADAR REFLECTIVITY - 95 GHz (RASTA)

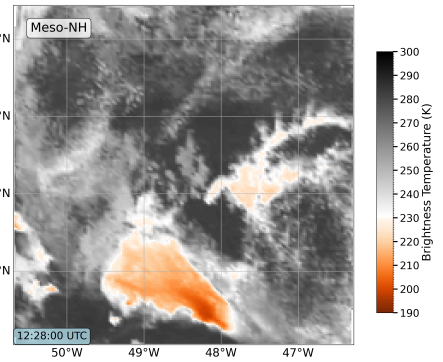


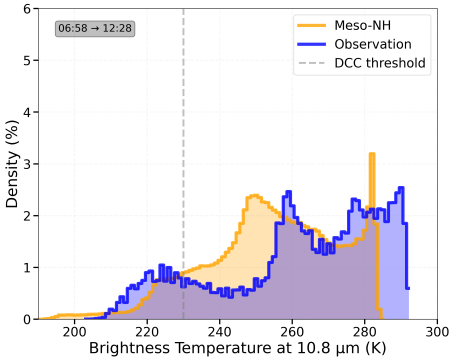




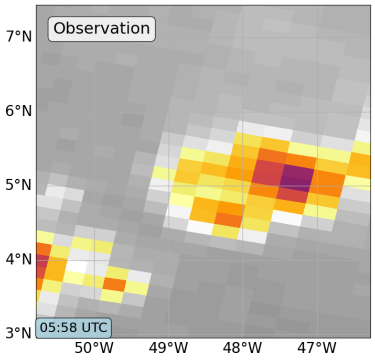
3. INFRARED - 10.8 µm

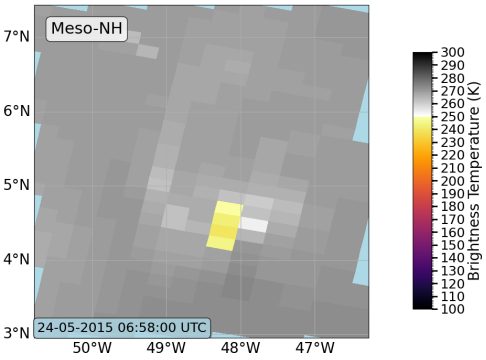


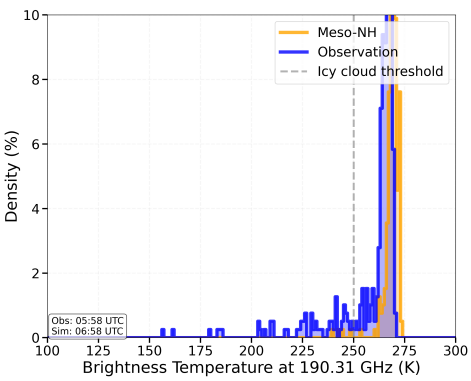




4. MHS - 190.31 GHz







HAIC-CAYENNE - F21

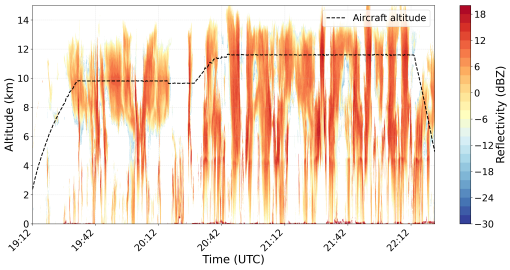
25/05/2015 18:28 → 23:58

Convection type:

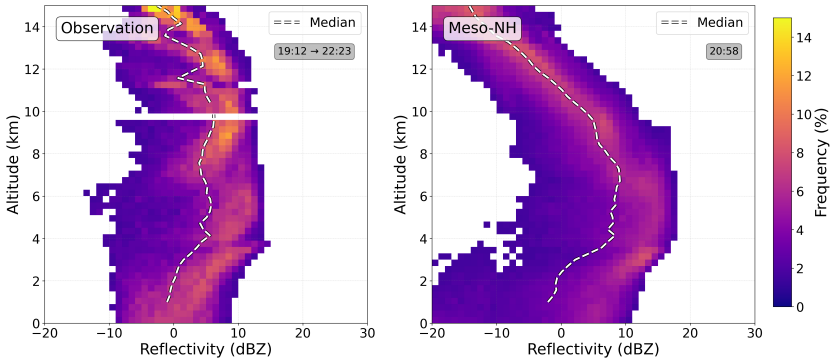
Mesoscale Convective System

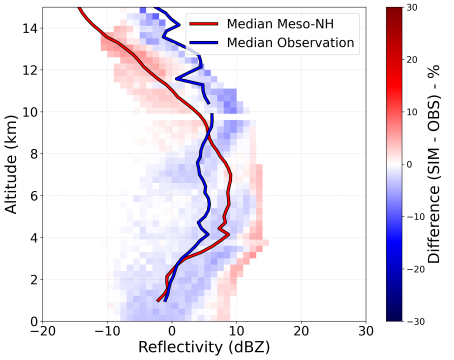
1. KEY INDICATORS

W max	**42.2 m/s**	IWP cover	**33.4%**	MTR bias	**2.3 dBZ**
dIWP/dt max	**2.38e-01 kg/m²/s**	IWP max	**49.7 kg/m²**	BT bias	**-0.7 K**
# convec. columns	**46600**	DCC cover	**21.9%**	DCC bias	**1.8%**
# growing columns	**23771**	Icy cover	**0.0%**	Icy bias	**0.0%**

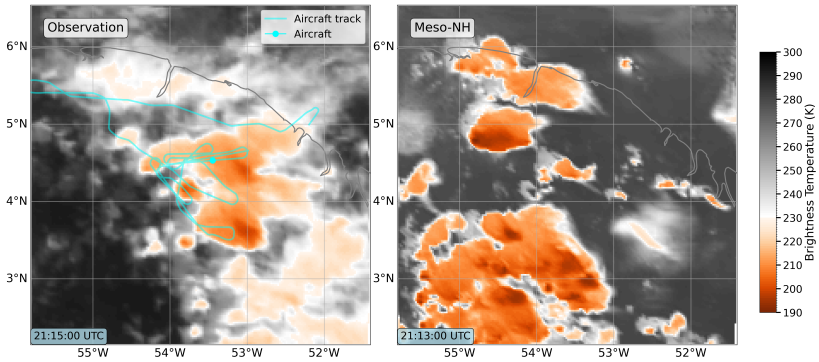


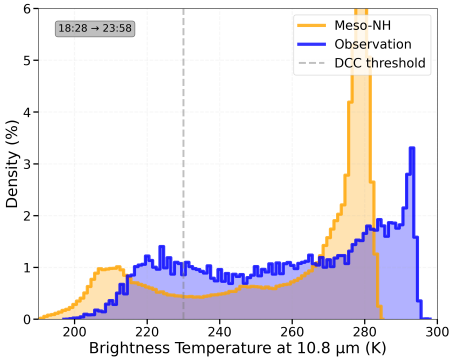
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



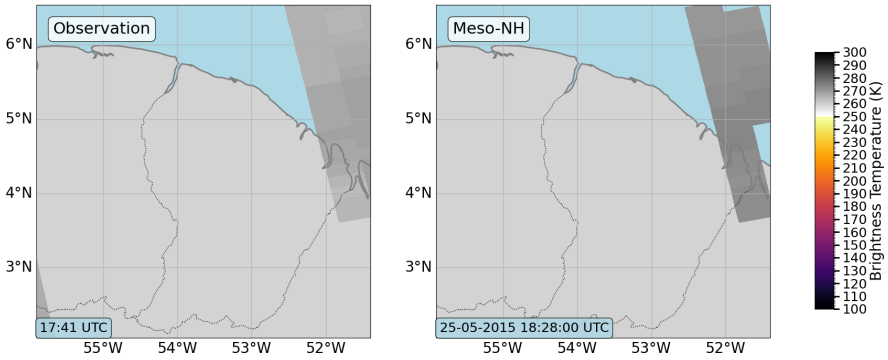


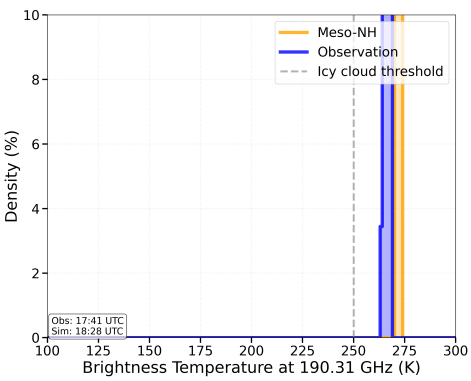
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-CAYENNE - F22

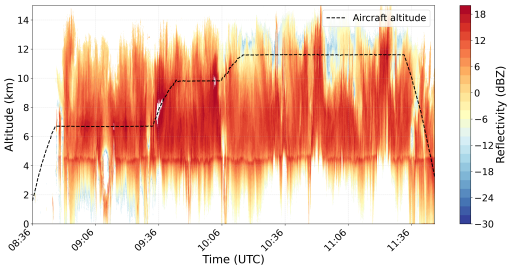
26/05/2015 06:58 → 12:28

Convection type:

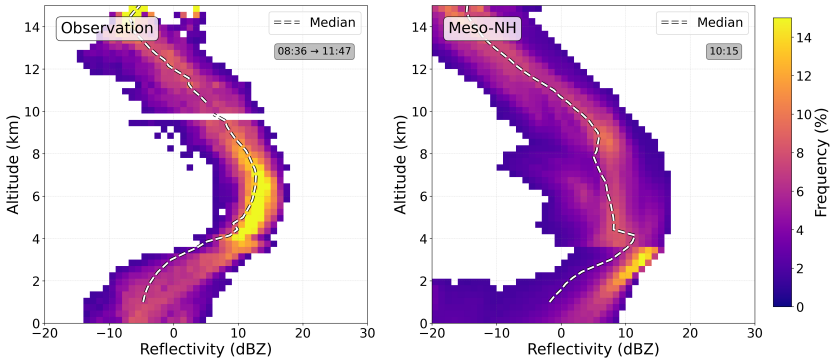
Mesoscale Convective System

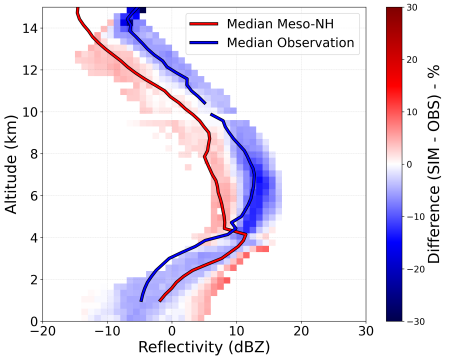
1. KEY INDICATORS

W max	**39.3 m/s**	IWP cover	**34.6%**	MTR bias	**-4.8 dBZ**
dIWP/dt max	**2.40e-01 kg/m²/s**	IWP max	**47.9 kg/m²**	BT bias	**-4.6 K**
# convec. columns	**98116**	DCC cover	**40.3%**	DCC bias	**-1.2%**
# growing columns	**27457**	Icy cover	**23.0%**	Icy bias	**-3.0%**

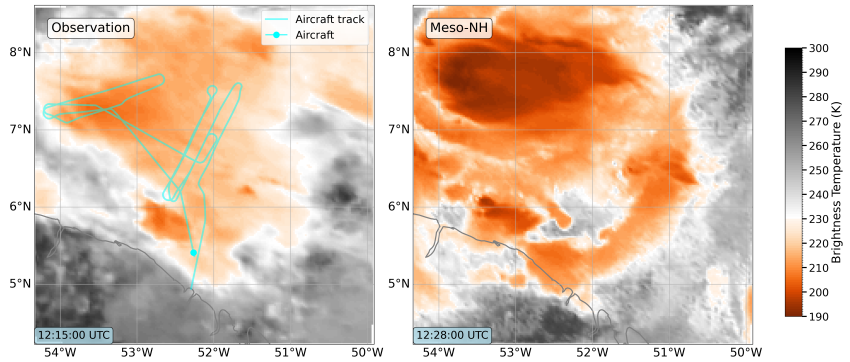


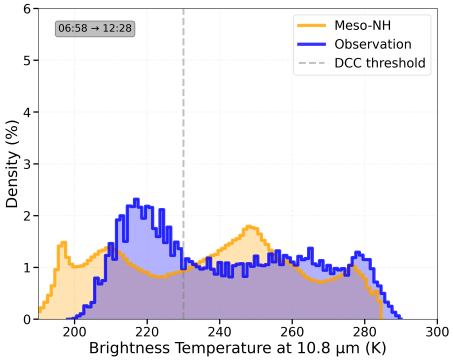
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



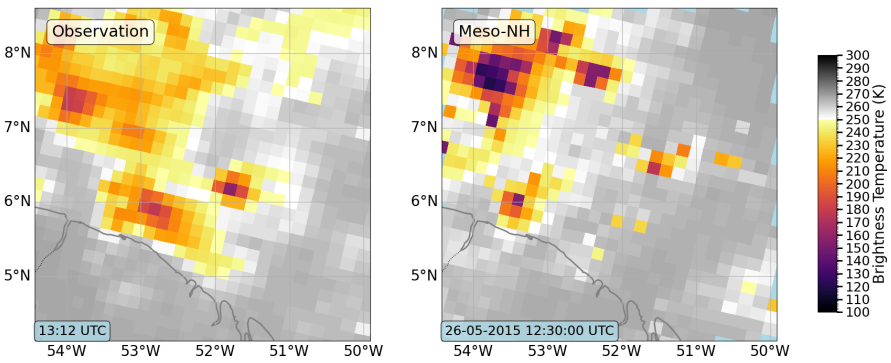


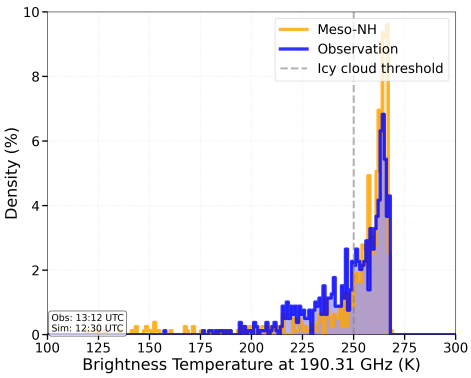
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-CAYENNE - F23

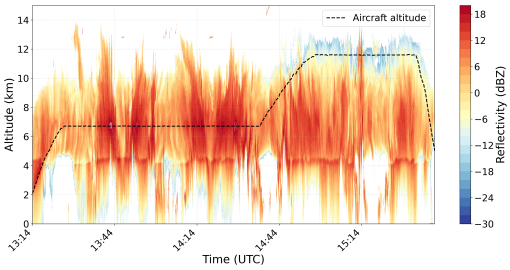
26/05/2015 12:28 ➔ 17:43

Convection type:

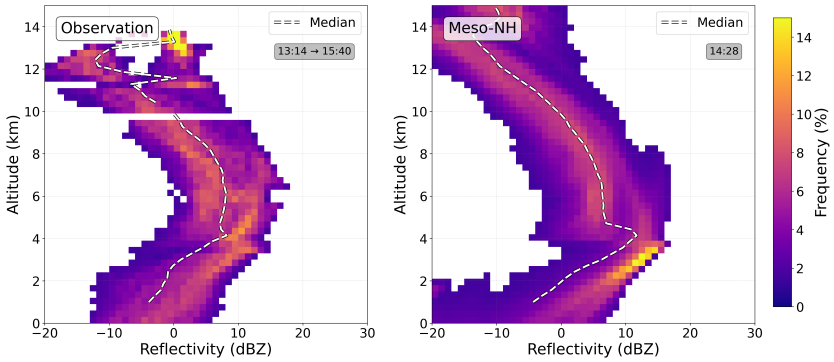
Mesoscale Convective System

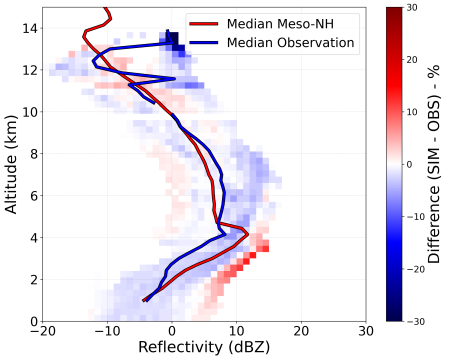
1. KEY INDICATORS

W max	**39.8 m/s**	IWP cover	**35.0%**	MTR bias	**-1.1 dBZ**
dIWP/dt max	**1.90e-01 kg/m²/s**	IWP max	**48.4 kg/m²**	BT bias	**-8.4 K**
# convec. columns	**71860**	DCC cover	**56.1%**	DCC bias	**11.0%**
# growing columns	**25819**	Icy cover	**30.2%**	Icy bias	**-7.0%**

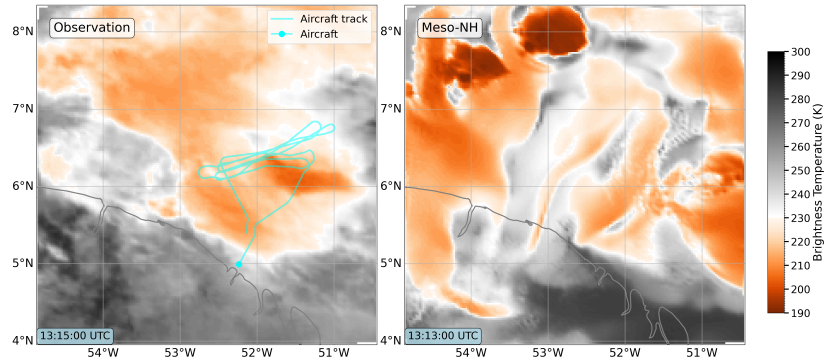


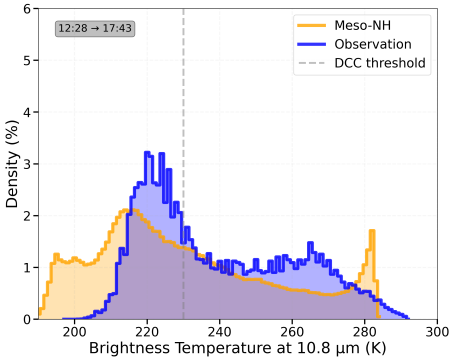
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



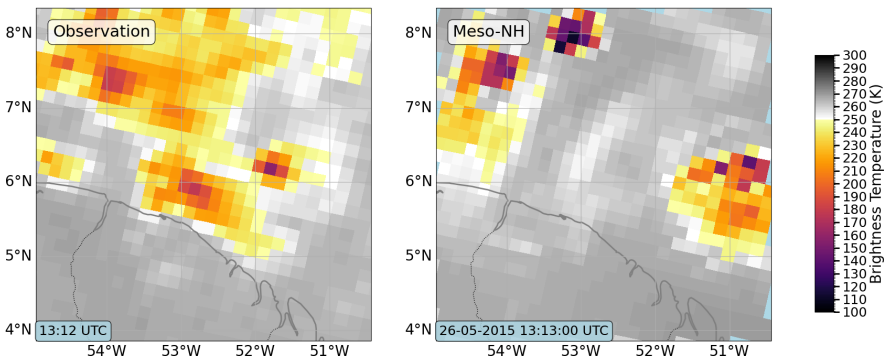


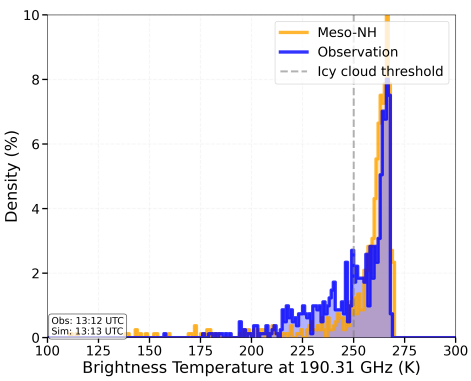
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-CAYENNE - F24

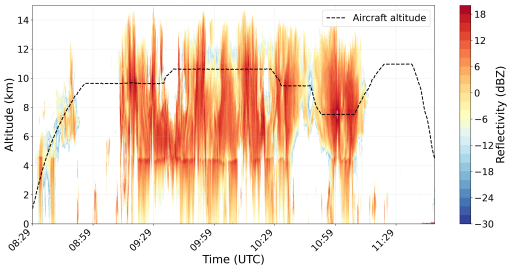
27/05/2015 06:58 ➔ 12:28

Convection type:

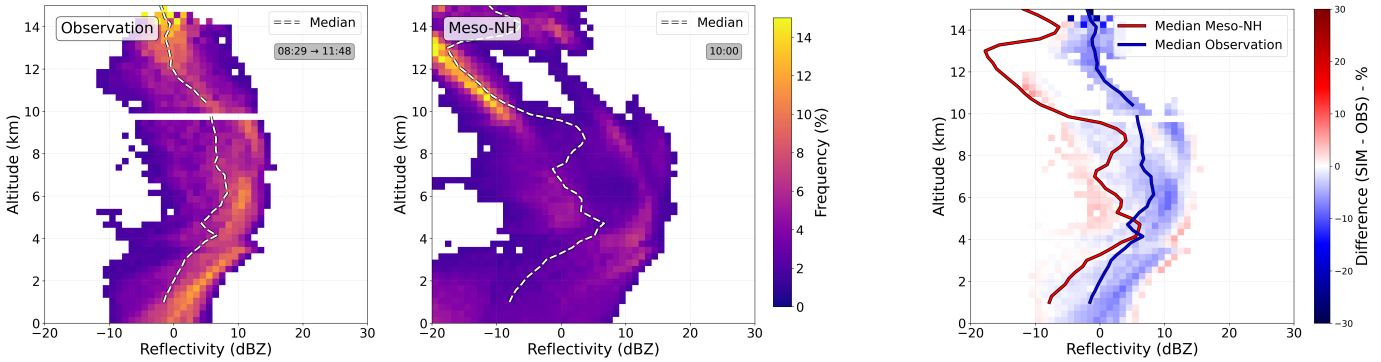
Mesoscale Convective System

1. KEY INDICATORS

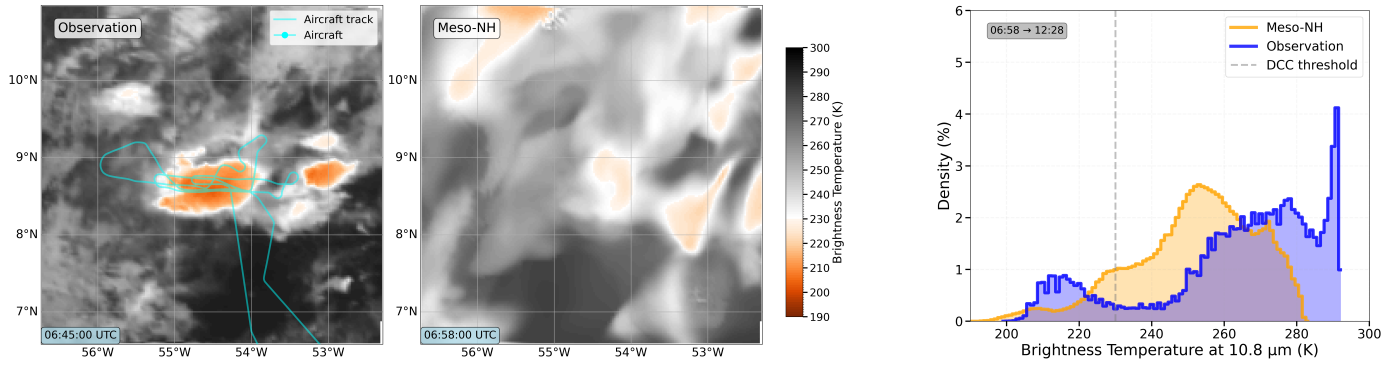
W max	**33.1 m/s**	IWP cover	**12.8%**	MTR bias	**-5.2 dBZ**
dIWP/dt max	**1.58e-01 kg/m²/s**	IWP max	**42.5 kg/m²**	BT bias	**-10.8 K**
# convec. columns	**18288**	DCC cover	**11.8%**	DCC bias	**-3.4%**
# growing columns	**8976**	Icy cover	**4.9%**	Icy bias	**-0.8%**



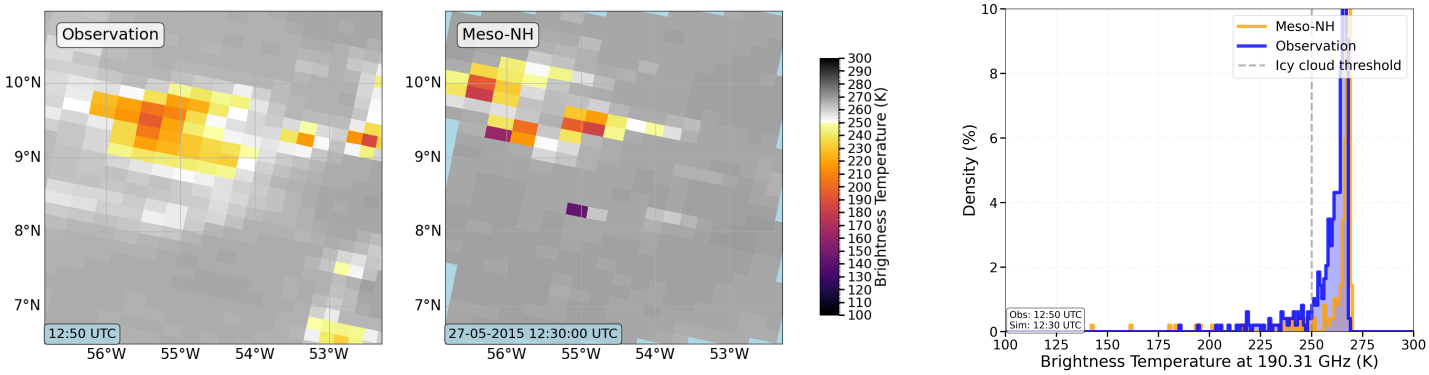
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F25

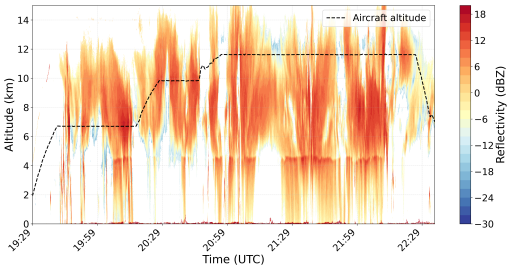
28/05/2015 18:28 → 23:58

Convection type:

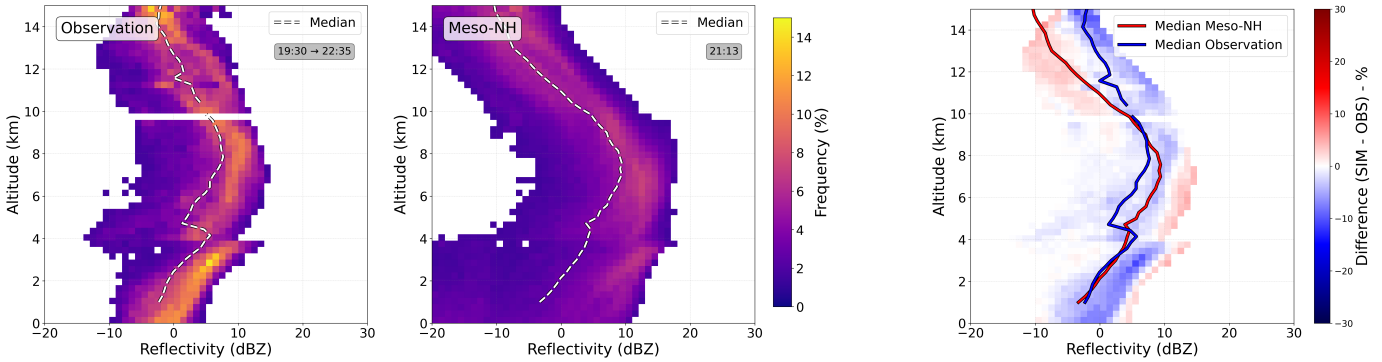
Mesoscale Convective System

1. KEY INDICATORS

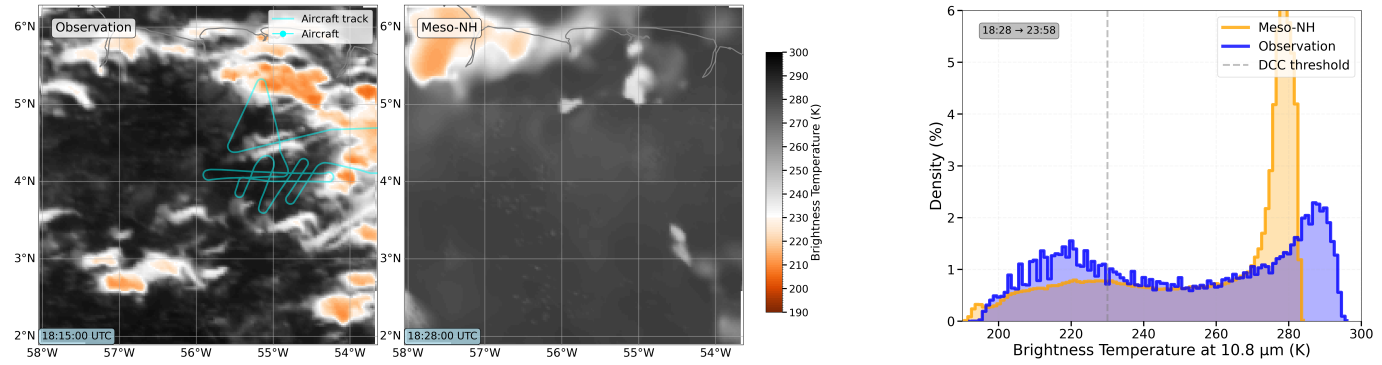
W max	**39.2 m/s**	IWP cover	**21.5%**	MTR bias	**1.8 dBZ**
dIWP/dt max	**2.22e-01 kg/m²/s**	IWP max	**40.6 kg/m²**	BT bias	**5.4 K**
# convec. columns	**31907**	DCC cover	**22.5%**	DCC bias	**-10.2%**
# growing columns	**19790**	Icy cover	**5.2%**	Icy bias	**-1.2%**



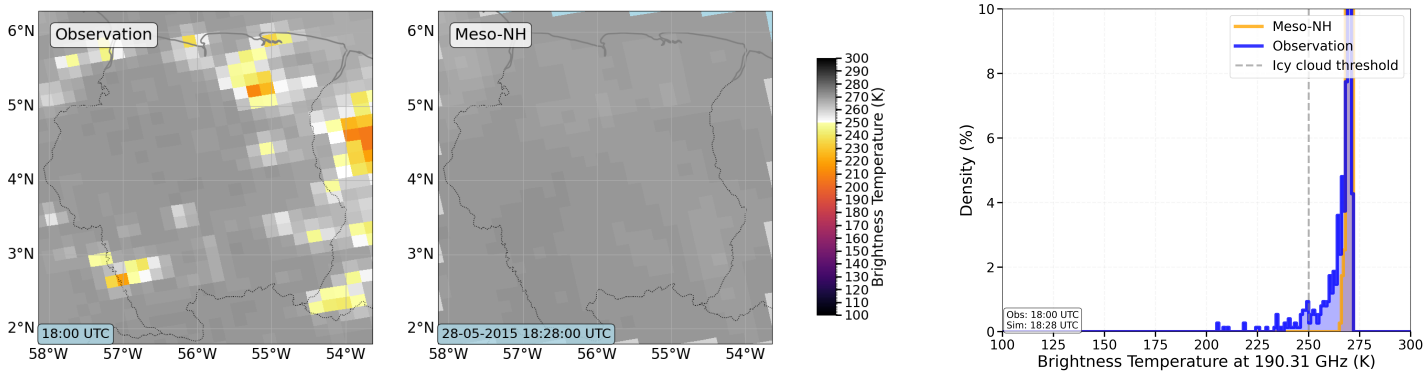
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-CAYENNE - F26

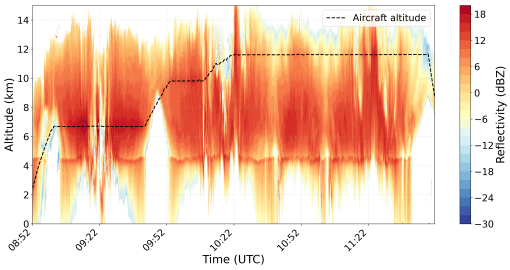
29/05/2015 06:58 → 12:28

Convection type:

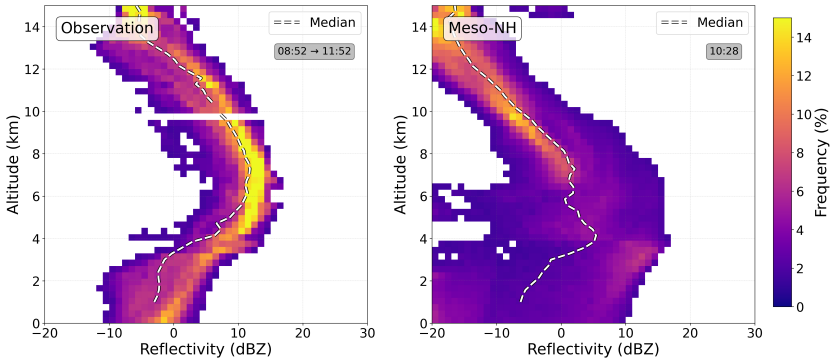
Mesoscale Convective System

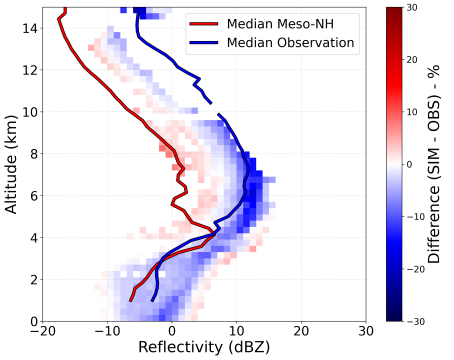
1. KEY INDICATORS

W max	**39.3 m/s**	IWP cover	**14.3%**	MTR bias	**-10.5 dBZ**
dIWP/dt max	**2.65e-01 kg/m²/s**	IWP max	**44.7 kg/m²**	BT bias	**3.4 K**
# convec. columns	**20429**	DCC cover	**26.3%**	DCC bias	**-19.5%**
# growing columns	**10140**	Icy cover	**6.0%**	Icy bias	**-20.8%**

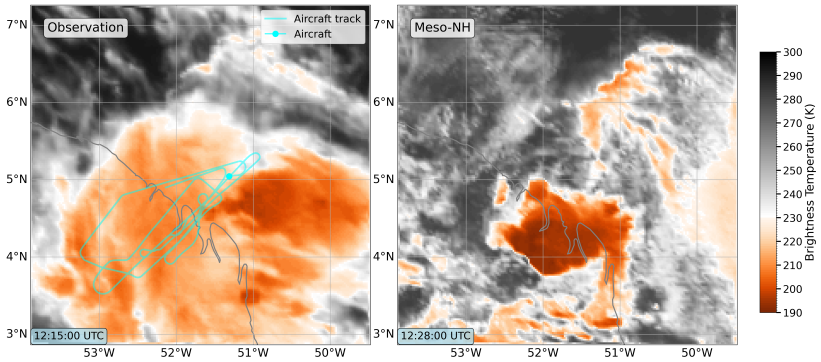


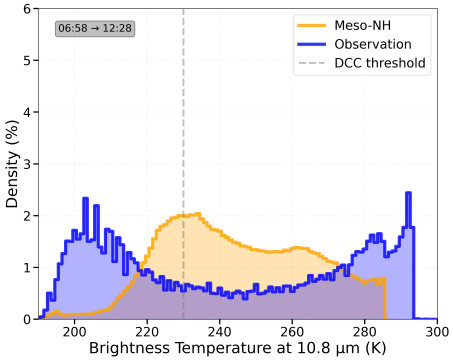
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



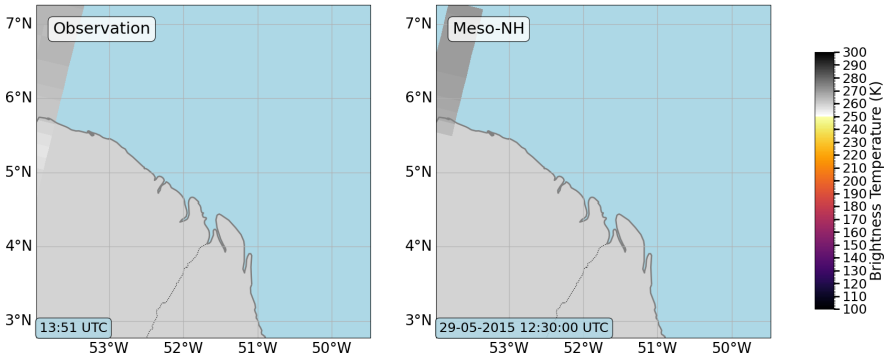


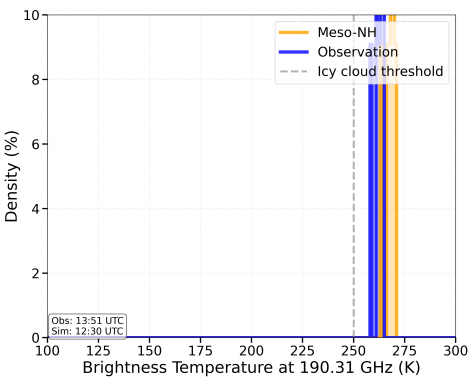
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-DARWIN - F1

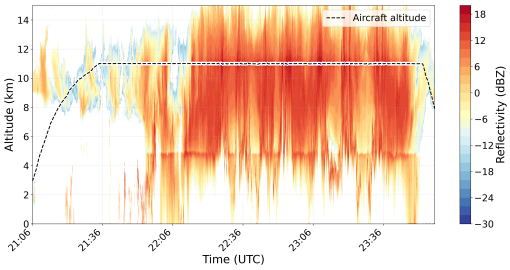
16/01/2014 00:30 ➔ 06:00

Convection type:

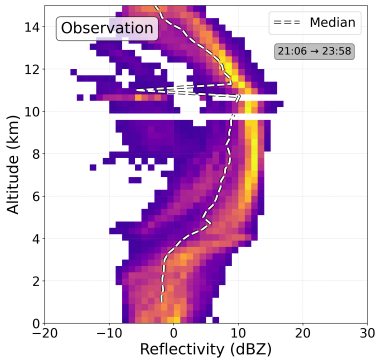
Mesoscale Convective System

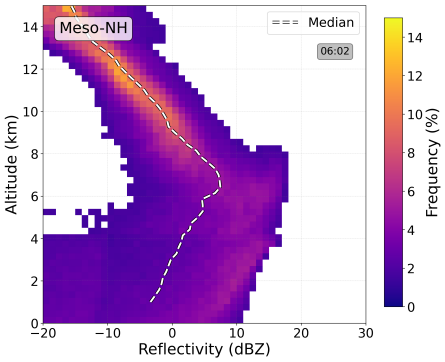
1. KEY INDICATORS

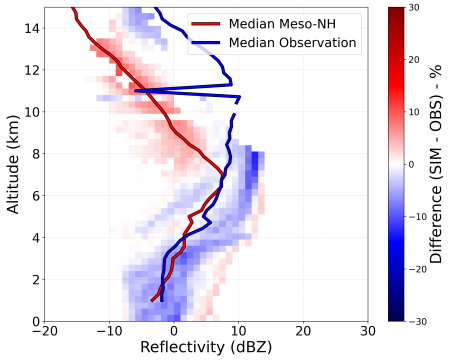
W max	**40.1 m/s**	IWP cover	**8.4%**	MTR bias	**-3.9 dBZ**
dIWP/dt max	**2.19e-01 kg/m²/s**	IWP max	**43.2 kg/m²**	BT bias	**7.7 K**
# convec. columns	**25321**	DCC cover	**27.2%**	DCC bias	**-11.4%**
# growing columns	**14532**	Icy cover	**4.9%**	Icy bias	**-10.8%**



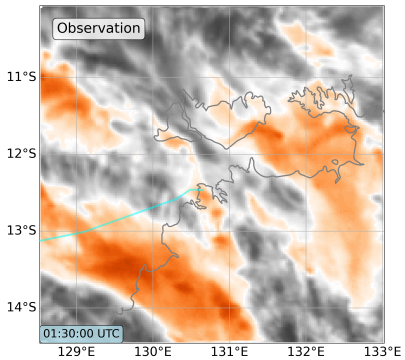
2. RADAR REFLECTIVITY - 95 GHz (RASTA)

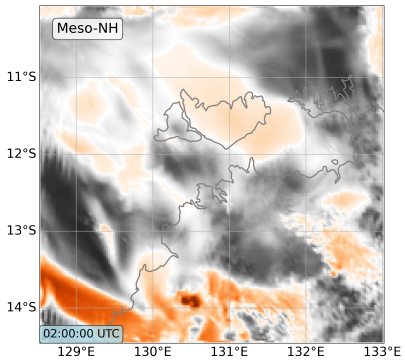


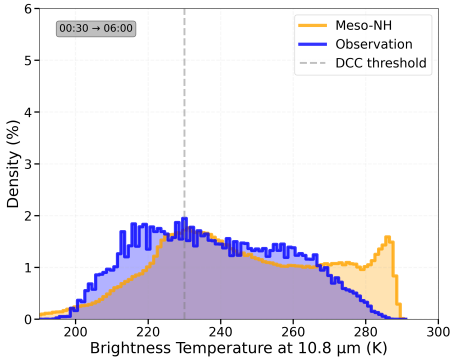




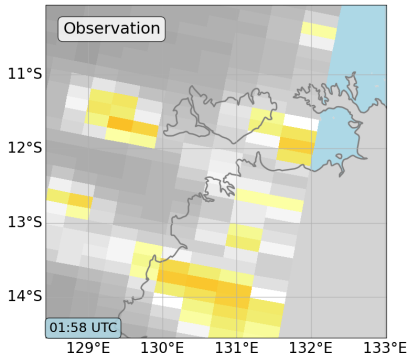
3. INFRARED - 10.8 µm

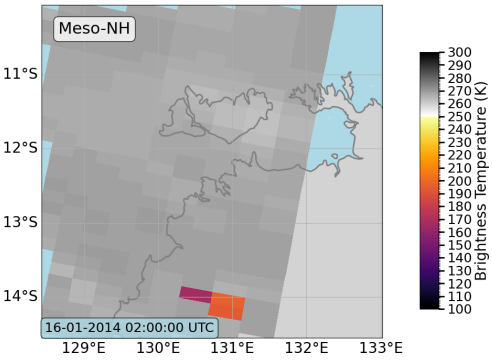


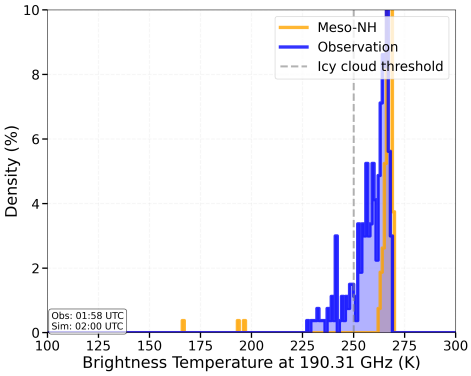




4. MHS - 190.31 GHz







HAIC-DARWIN - F2

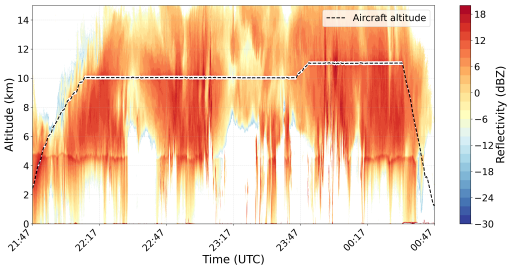
16/01/2014 22:00 ➔ 03:30

Convection type:

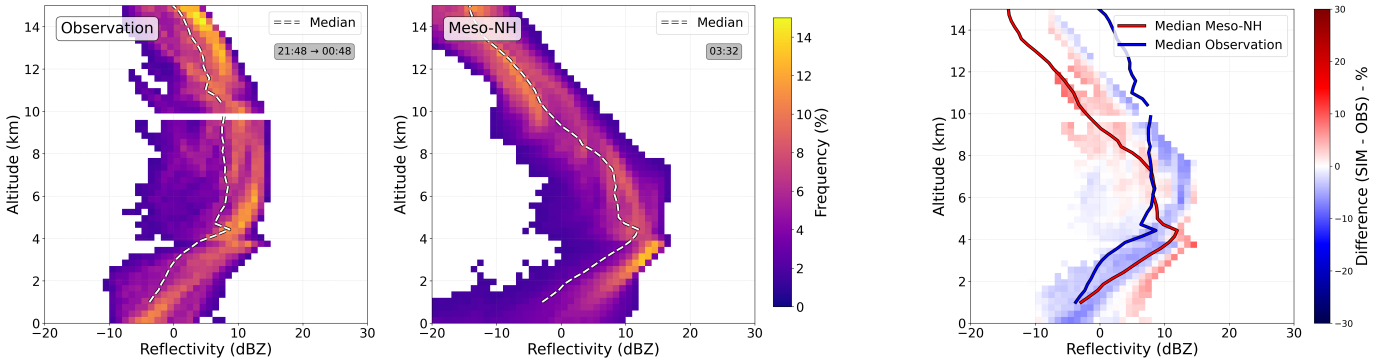
Mesoscale Convective System

1. KEY INDICATORS

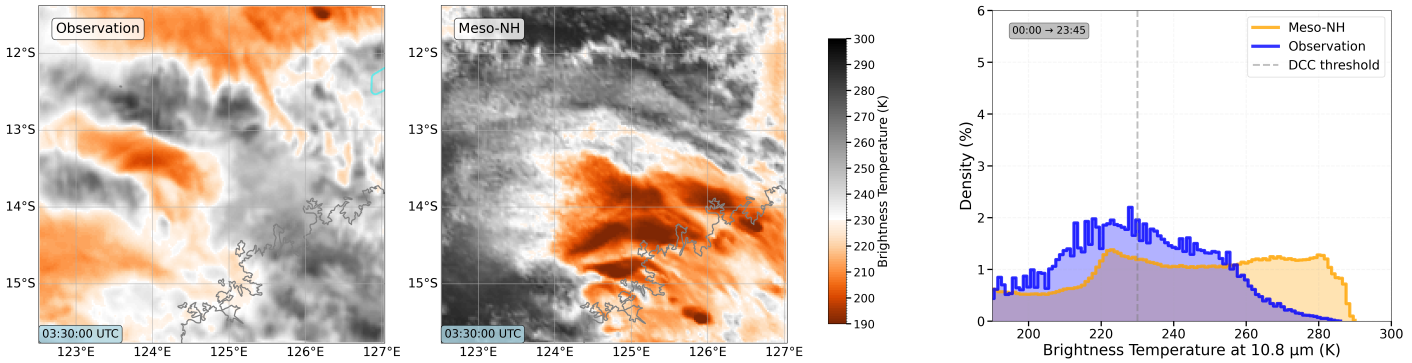
W max	**47.7 m/s**	IWP cover	**20.2%**	MTR bias	**-2.2 dBZ**
dIWP/dt max	**2.10e-01 kg/m²/s**	IWP max	**48.1 kg/m²**	BT bias	**11.7 K**
# convec. columns	**59268**	DCC cover	**35.7%**	DCC bias	**-13.7%**
# growing columns	**22189**	Icy cover	**10.2%**	Icy bias	**-1.7%**



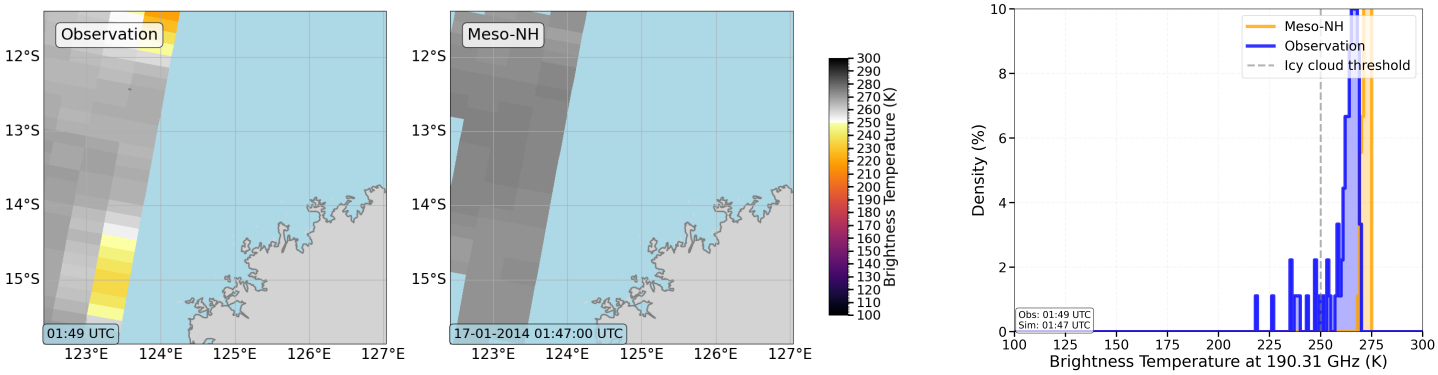
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F3

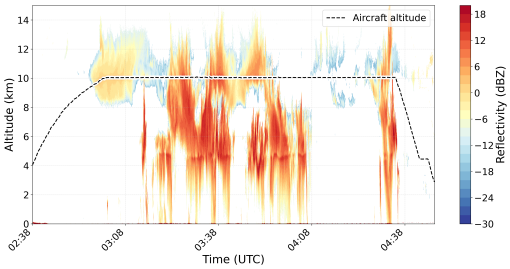
17/01/2014 02:00 ➔ 07:30

Convection type:

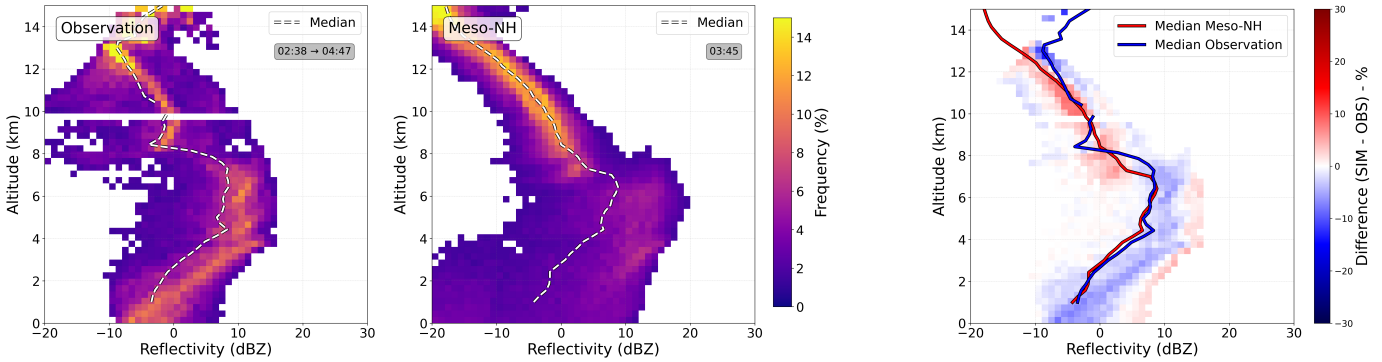
Mesoscale Convective System

1. KEY INDICATORS

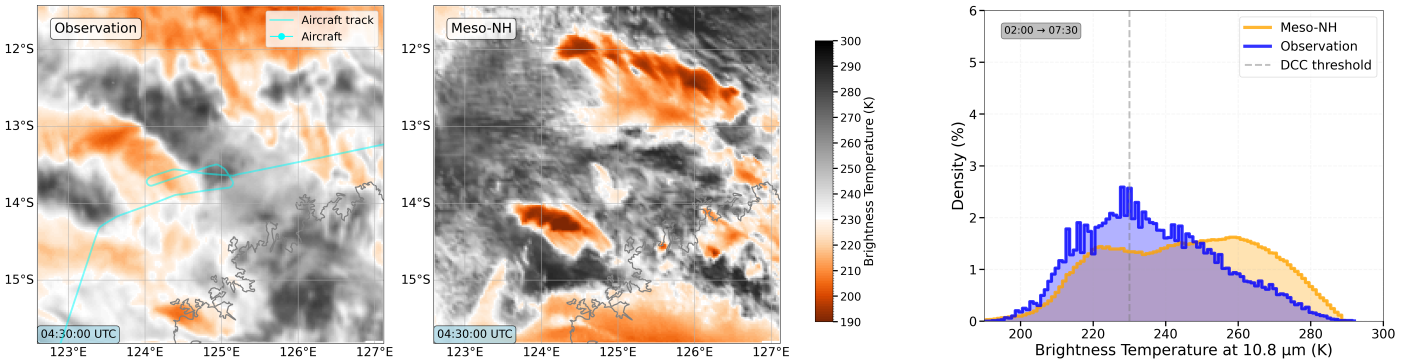
W max	**36.1 m/s**	IWP cover	**6.1%**	MTR bias	**-0.2 dBZ**
dIWP/dt max	**2.08e-01 kg/m²/s**	IWP max	**42.1 kg/m²**	BT bias	**8.3 K**
# convec. columns	**13201**	DCC cover	**27.8%**	DCC bias	**-10.4%**
# growing columns	**7288**	Icy cover	**4.0%**	Icy bias	**-7.5%**



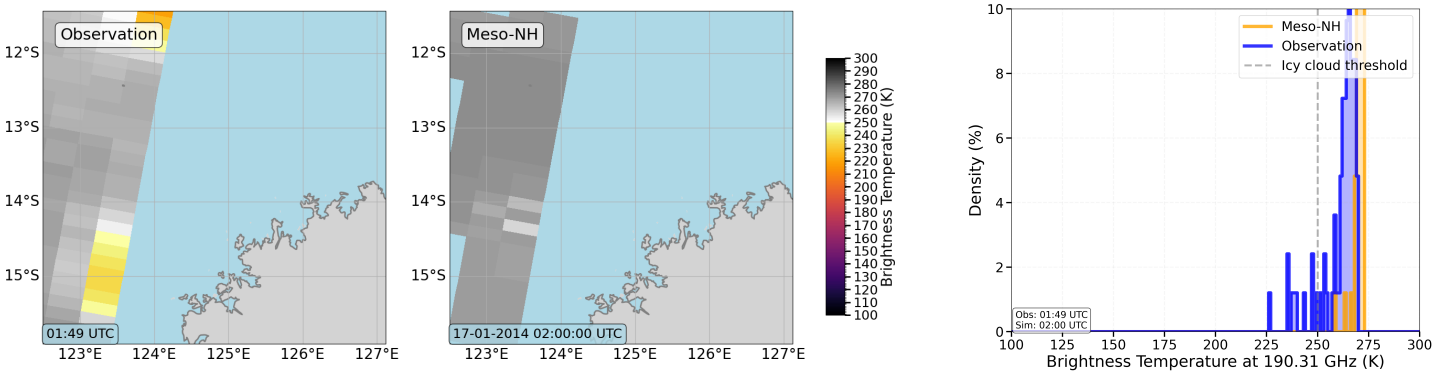
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F4

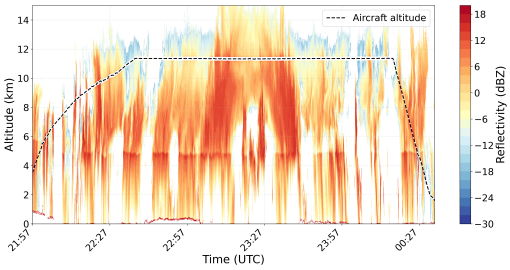
18/01/2014 22:00 ➔ 23:45

Convection type:

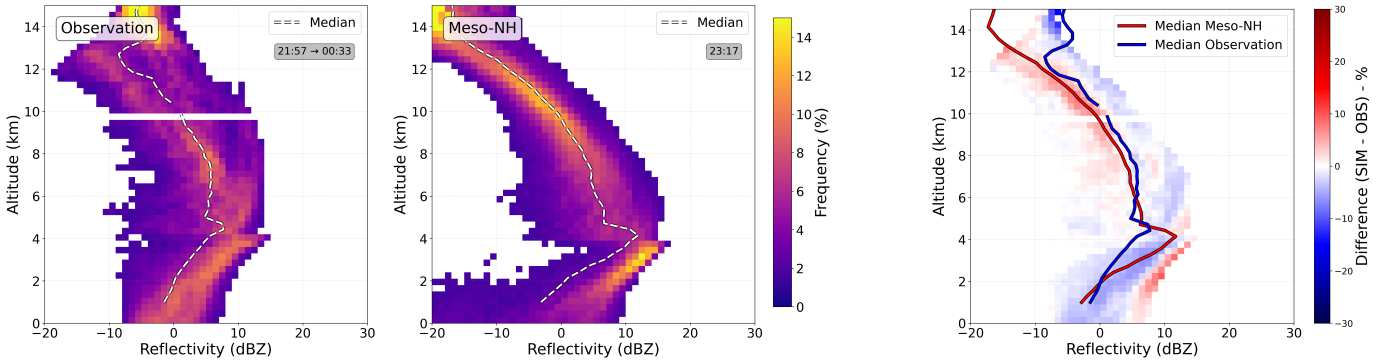
Mesoscale Convective System

1. KEY INDICATORS

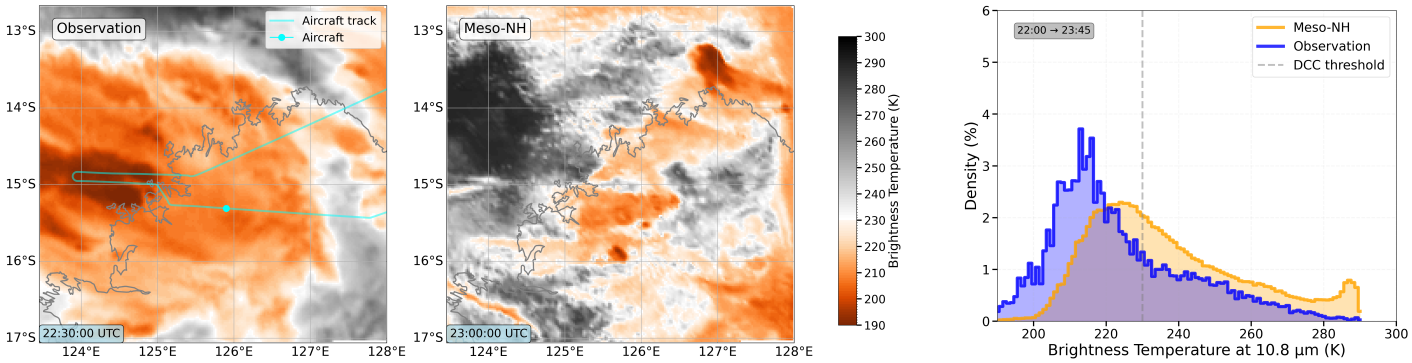
W max	**31.8 m/s**	IWP cover	**21.6%**	MTR bias	**-0.7 dBZ**
dIWP/dt max	**1.74e-01 kg/m²/s**	IWP max	**39.3 kg/m²**	BT bias	**13.4 K**
# convec. columns	**12163**	DCC cover	**45.8%**	DCC bias	**-24.2%**
# growing columns	**6114**	Icy cover	**0.0%**	Icy bias	**0.0%**



2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz

No MHS 190 GHz comparison available

HAIC-DARWIN - F5

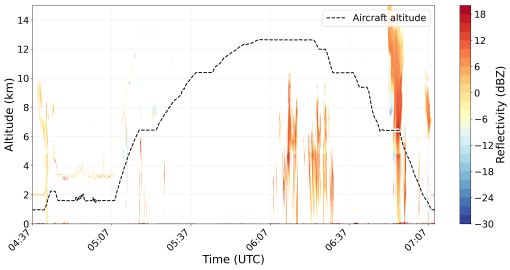
21/01/2014 03:58 → 09:28

Convection type:

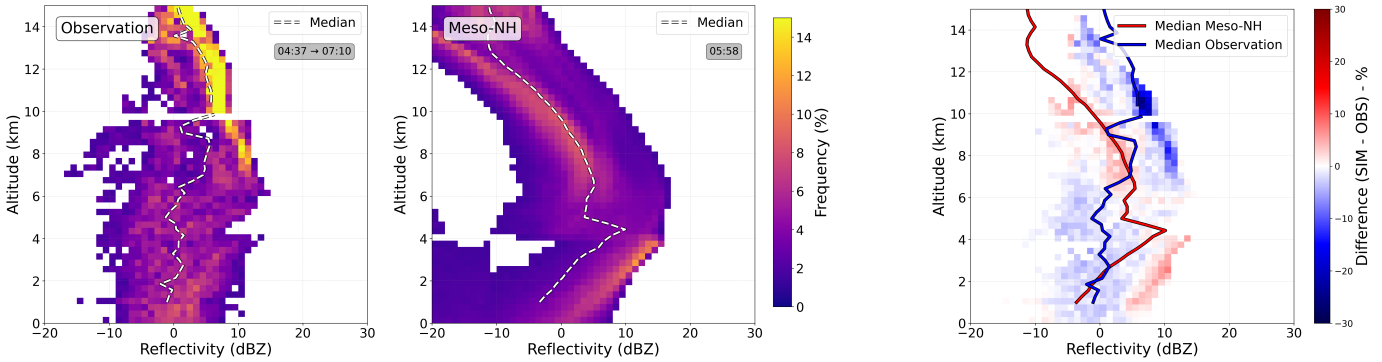
Mesoscale Convective System

1. KEY INDICATORS

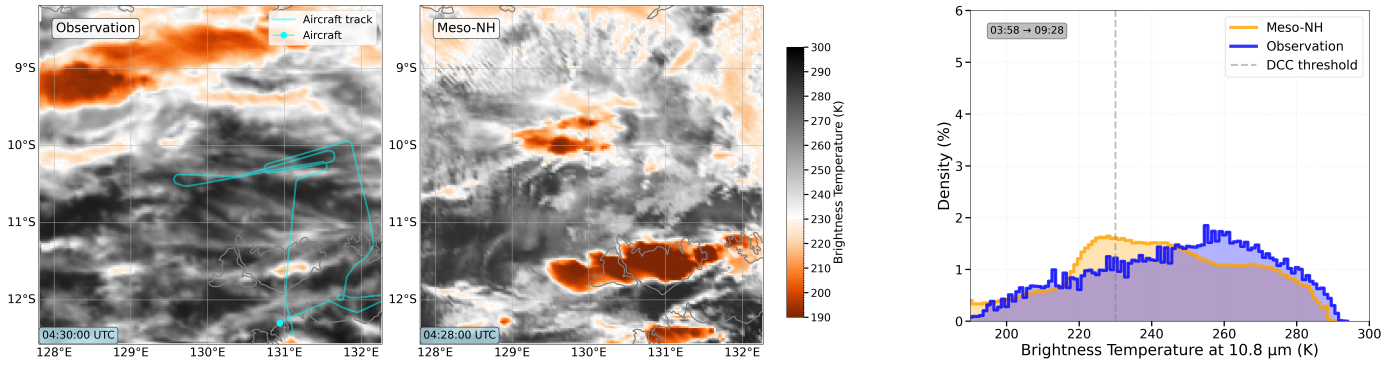
W max	**39.7 m/s**	IWP cover	**23.7%**	MTR bias	**0.3 dBZ**
dIWP/dt max	**1.88e-01 kg/m²/s**	IWP max	**47.2 kg/m²**	BT bias	**-5.7 K**
# convec. columns	**41614**	DCC cover	**33.5%**	DCC bias	**7.8%**
# growing columns	**17424**	Icy cover	**10.2%**	Icy bias	**-5.6%**



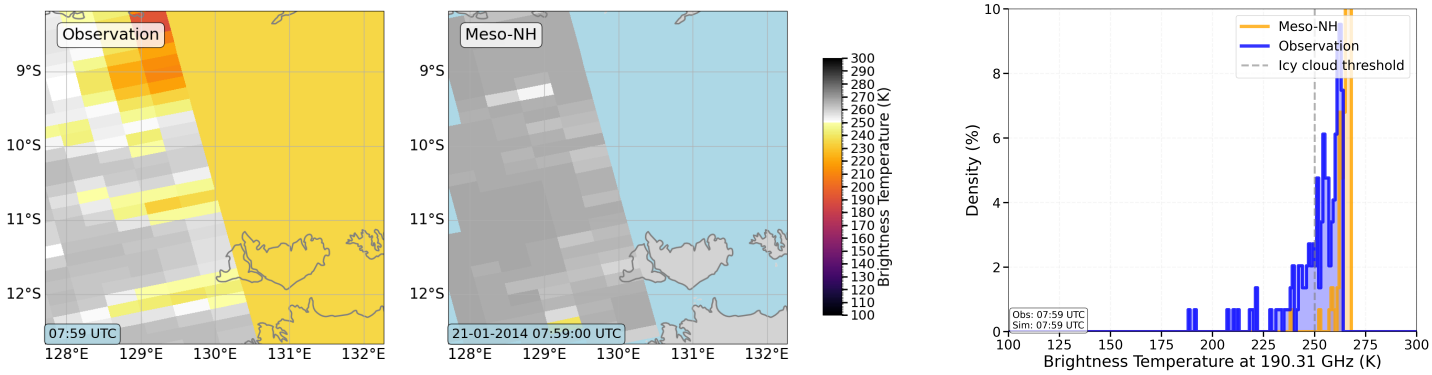
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F6

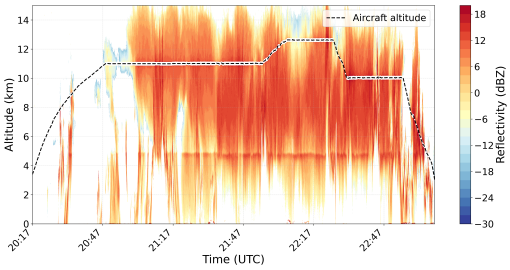
23/01/2014 18:30 ➔ 00:00

Convection type:

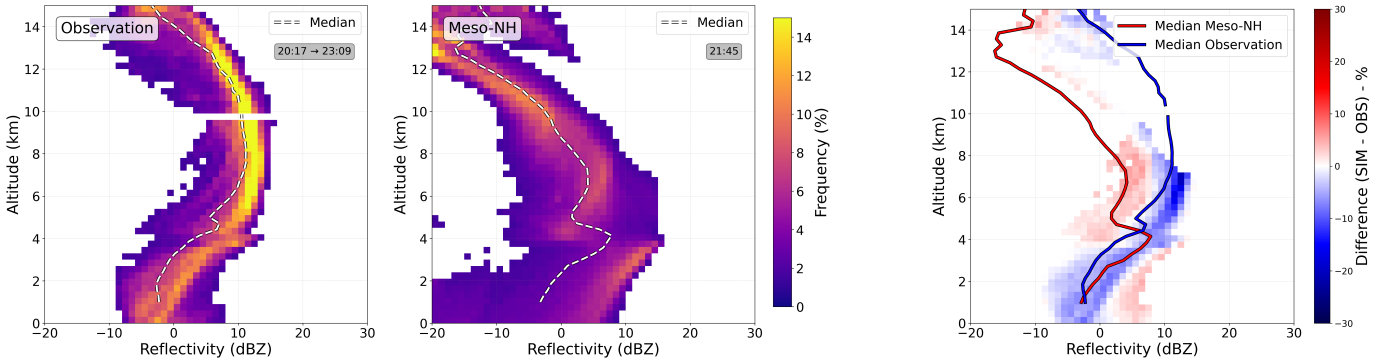
Mesoscale Convective System

1. KEY INDICATORS

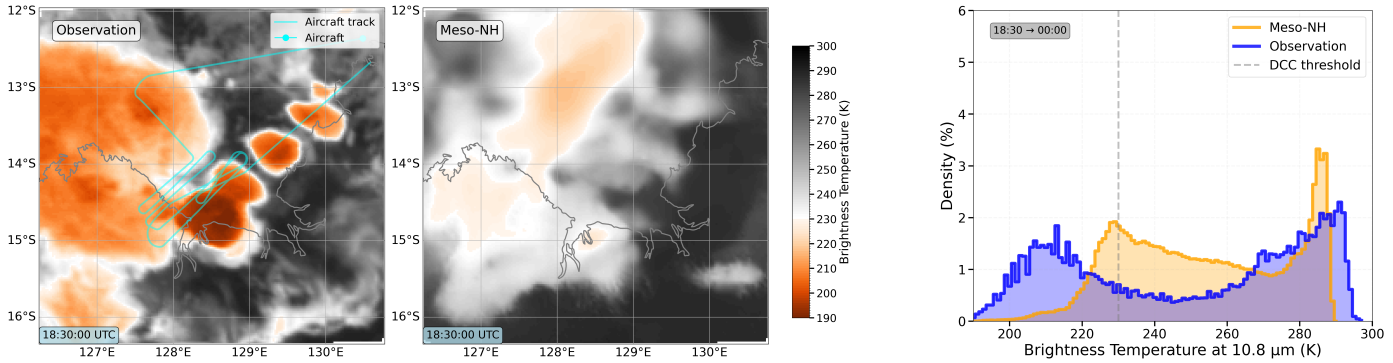
W max	**31.2 m/s**	IWP cover	**16.5%**	MTR bias	**-8.0 dBZ**
dIWP/dt max	**1.46e-01 kg/m²/s**	IWP max	**39.1 kg/m²**	BT bias	**5.2 K**
# convec. columns	**19991**	DCC cover	**18.2%**	DCC bias	**-20.3%**
# growing columns	**6622**	Icy cover	**1.9%**	Icy bias	**-23.3%**



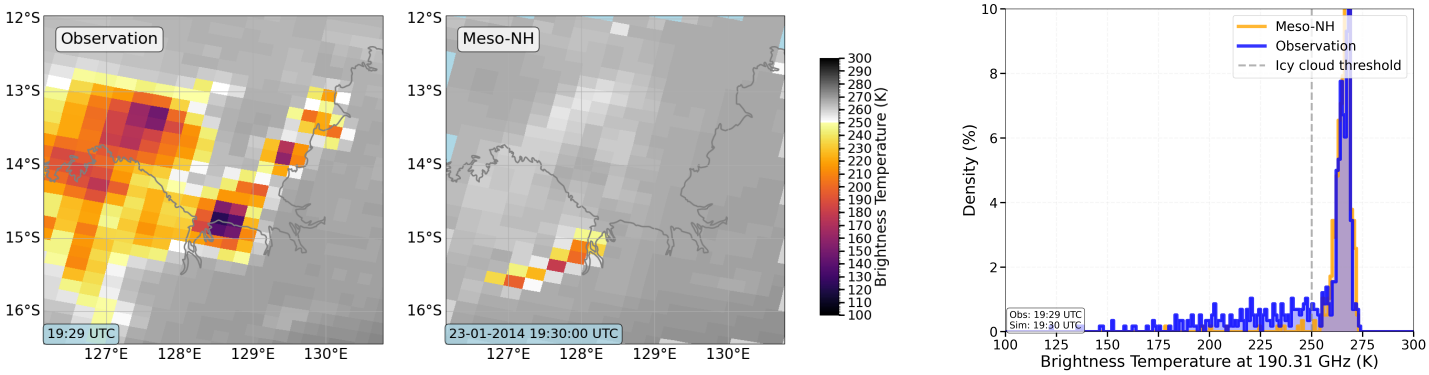
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F7

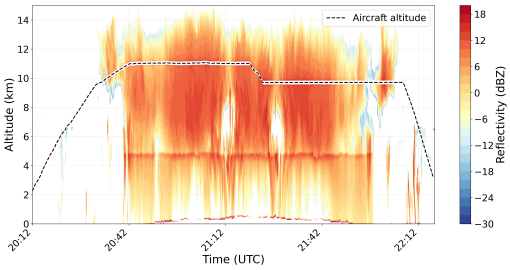
24/01/2014 18:28 → 23:58

Convection type:

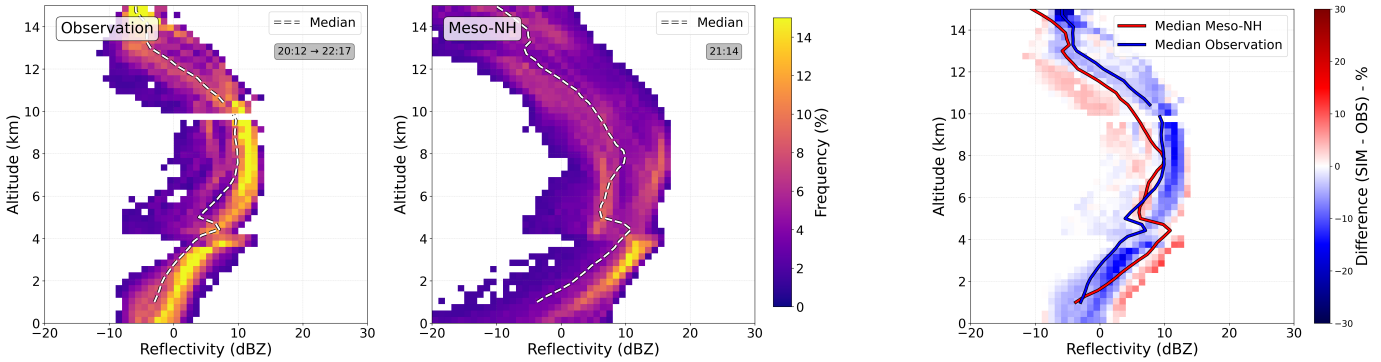
Mesoscale Convective System

1. KEY INDICATORS

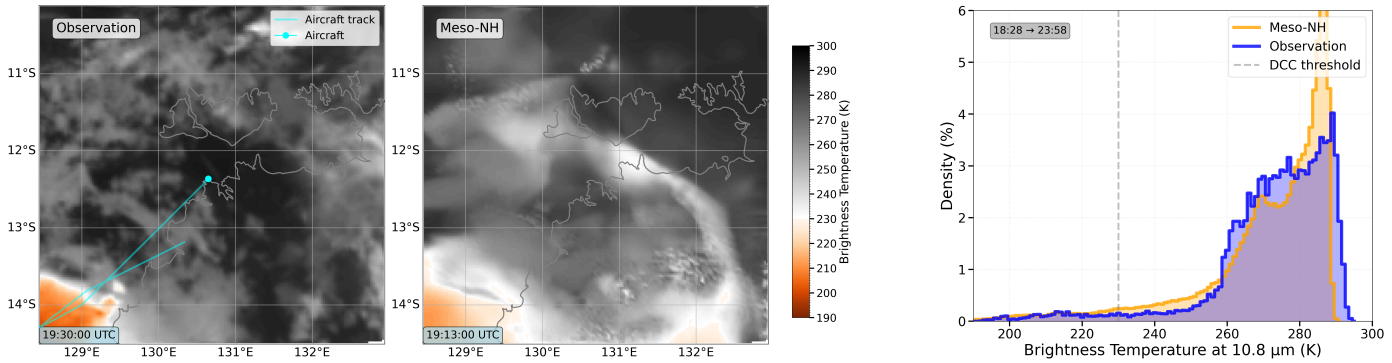
W max	**33.3 m/s**	IWP cover	**29.1%**	MTR bias	**-0.9 dBZ**
dIWP/dt max	**2.15e-01 kg/m²/s**	IWP max	**44.3 kg/m²**	BT bias	**-2.6 K**
# convec. columns	**17377**	DCC cover	**5.2%**	DCC bias	**2.2%**
# growing columns	**5491**	Icy cover	**3.6%**	Icy bias	**1.2%**



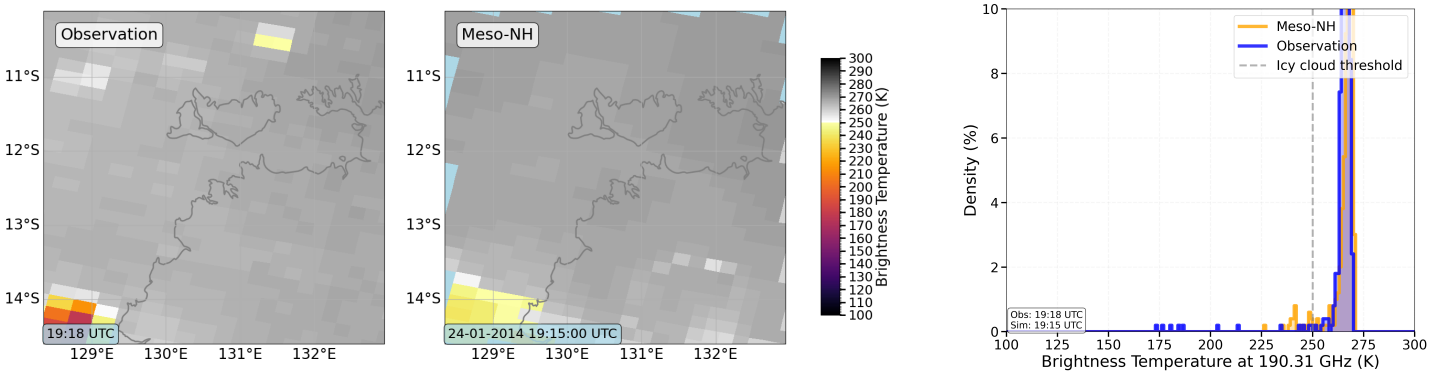
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F8

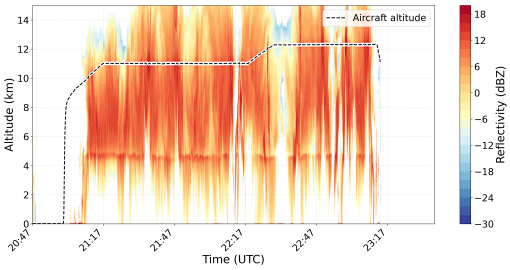
27/01/2014 19:58 ➔ 01:13

Convection type:

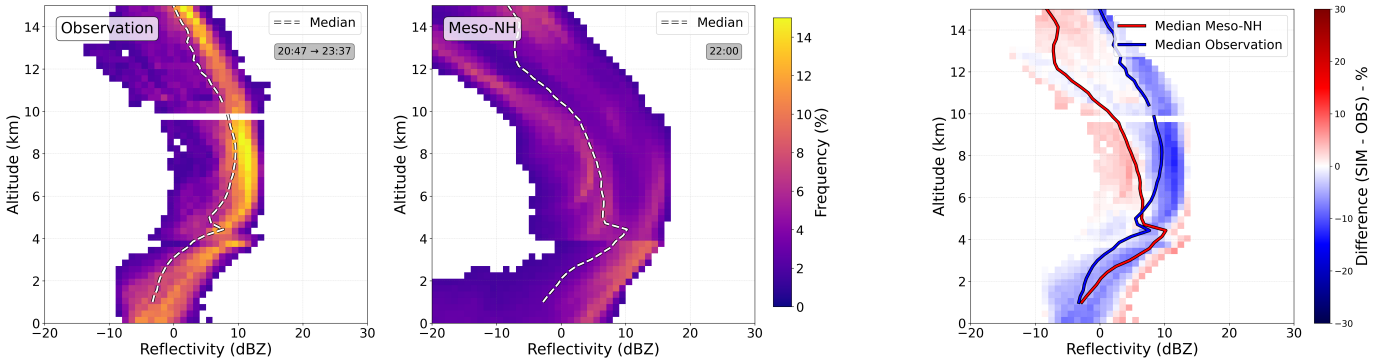
Mesoscale Convective System

1. KEY INDICATORS

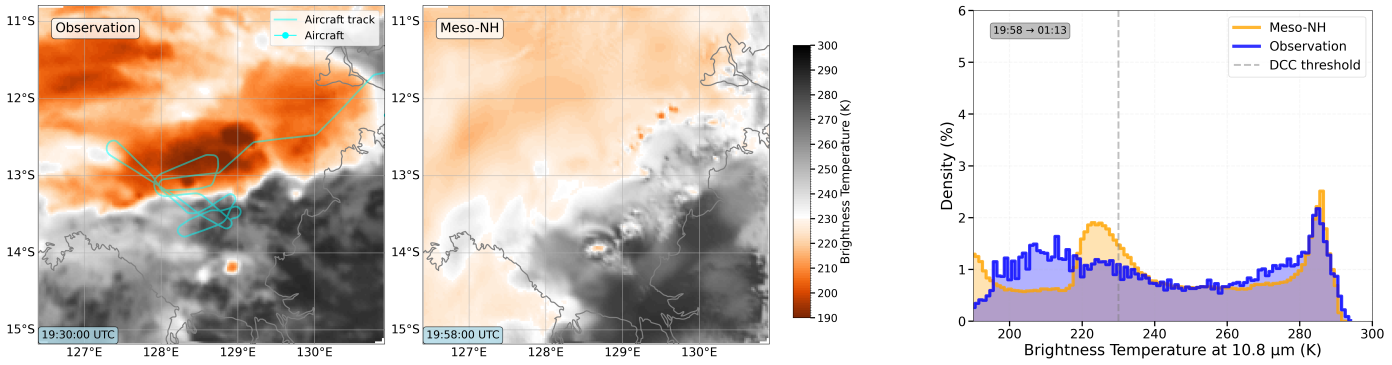
W max	**47.9 m/s**	IWP cover	**42.7%**	MTR bias	**-3.3 dBZ**
dIWP/dt max	**3.35e-01 kg/m²/s**	IWP max	**53.3 kg/m²**	BT bias	**-1.2 K**
# convec. columns	**101607**	DCC cover	**44.8%**	DCC bias	**0.1%**
# growing columns	**30001**	Icy cover	**15.0%**	Icy bias	**-35.9%**



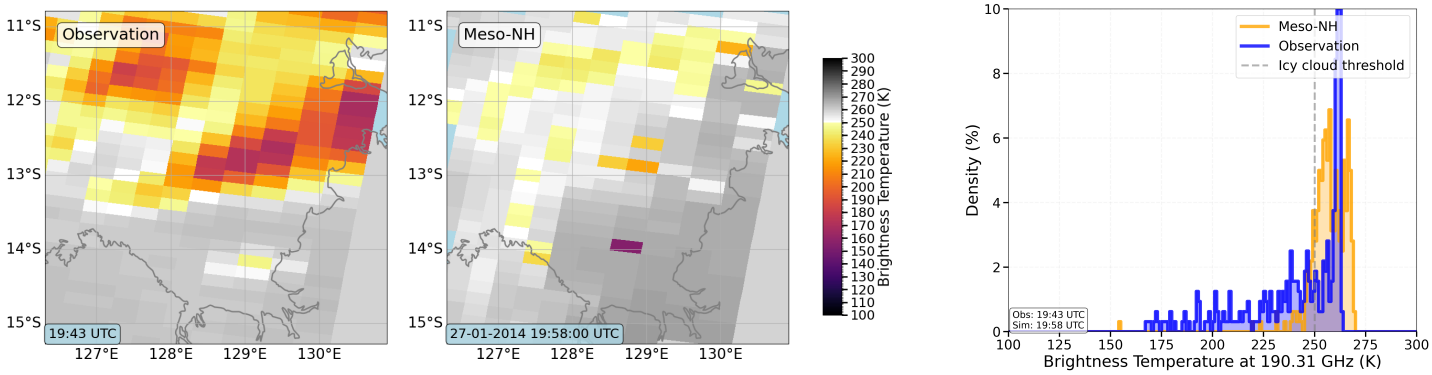
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F9

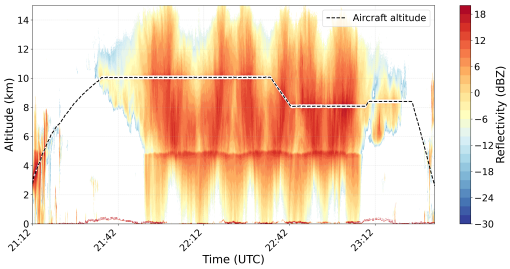
28/01/2014 21:00 ➔ 02:30

Convection type:

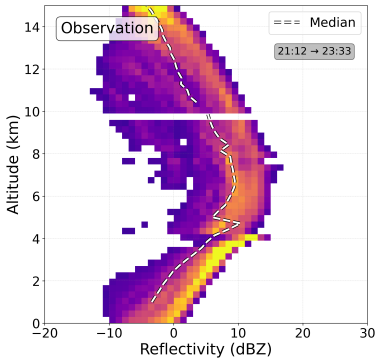
Isolated Cells

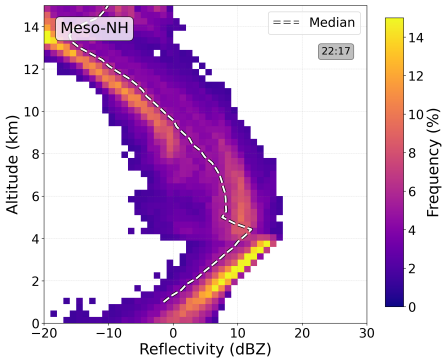
1. KEY INDICATORS

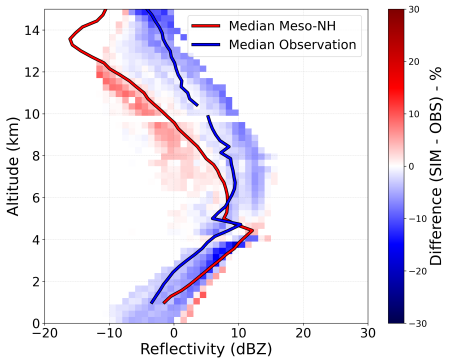
W max	**30.1 m/s**	IWP cover	**28.8%**	MTR bias	**-2.7 dBZ**
dIWP/dt max	**1.91e-01 kg/m²/s**	IWP max	**41.5 kg/m²**	BT bias	**11.3 K**
# convec. columns	**23030**	DCC cover	**23.5%**	DCC bias	**-23.2%**
# growing columns	**7508**	Icy cover	**0.0%**	Icy bias	**0.0%**



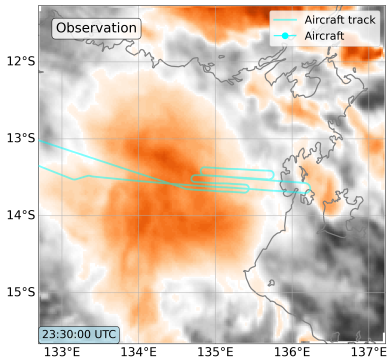
2. RADAR REFLECTIVITY - 95 GHz (RASTA)

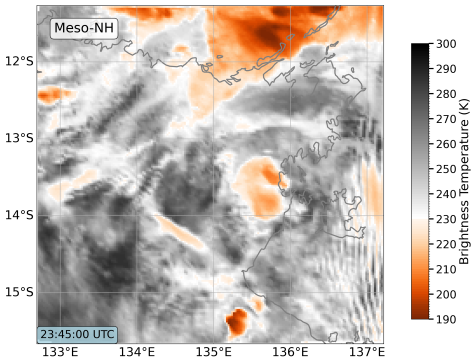


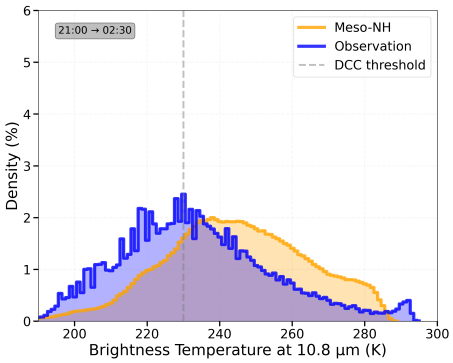




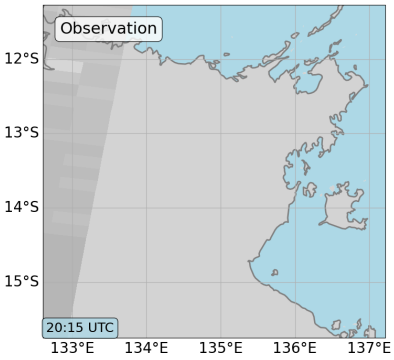
3. INFRARED - 10.8 µm

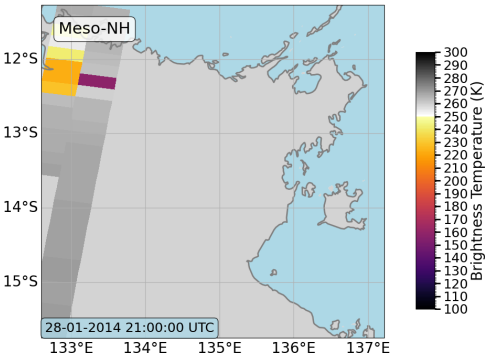


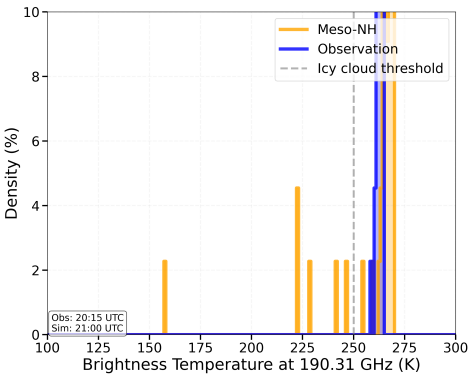




4. MHS - 190.31 GHz







HAIC-DARWIN - F10

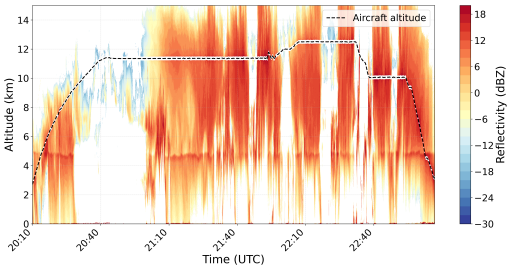
29/01/2014 21:00 ➔ 02:30

Convection type:

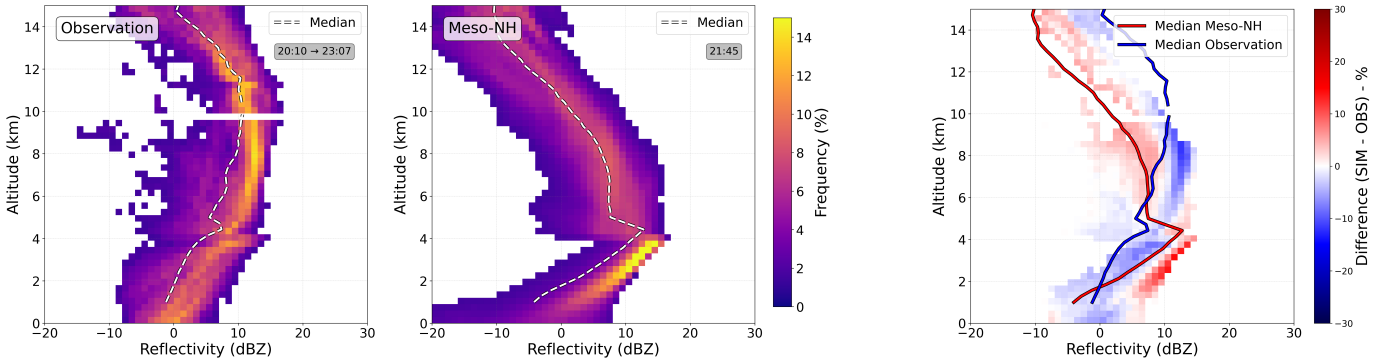
Mesoscale Convective System

1. KEY INDICATORS

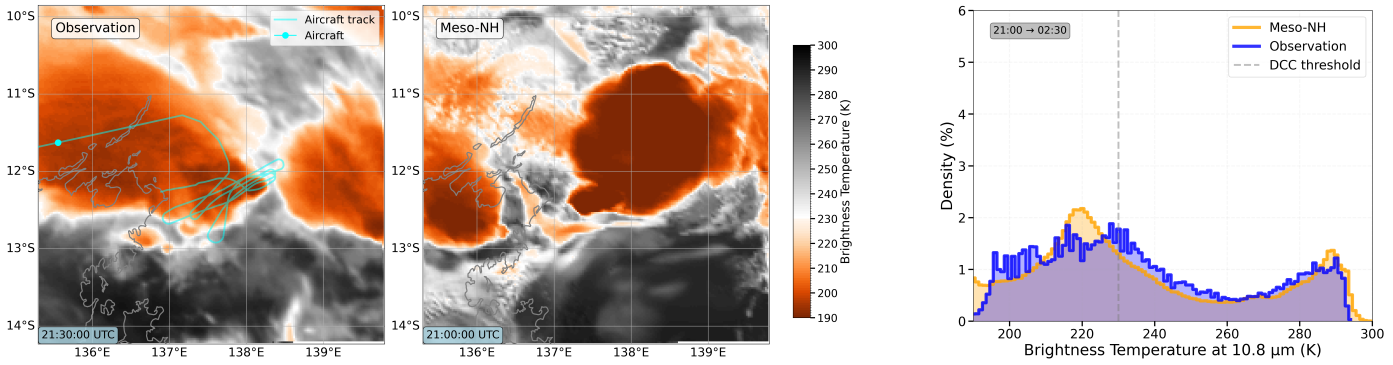
W max	**34.2 m/s**	IWP cover	**45.1%**	MTR bias	**-2.7 dBZ**
dIWP/dt max	**1.29e-01 kg/m²/s**	IWP max	**48.2 kg/m²**	BT bias	**-1.3 K**
# convec. columns	**51415**	DCC cover	**54.8%**	DCC bias	**6.4%**
# growing columns	**10282**	Icy cover	**29.1%**	Icy bias	**-10.1%**



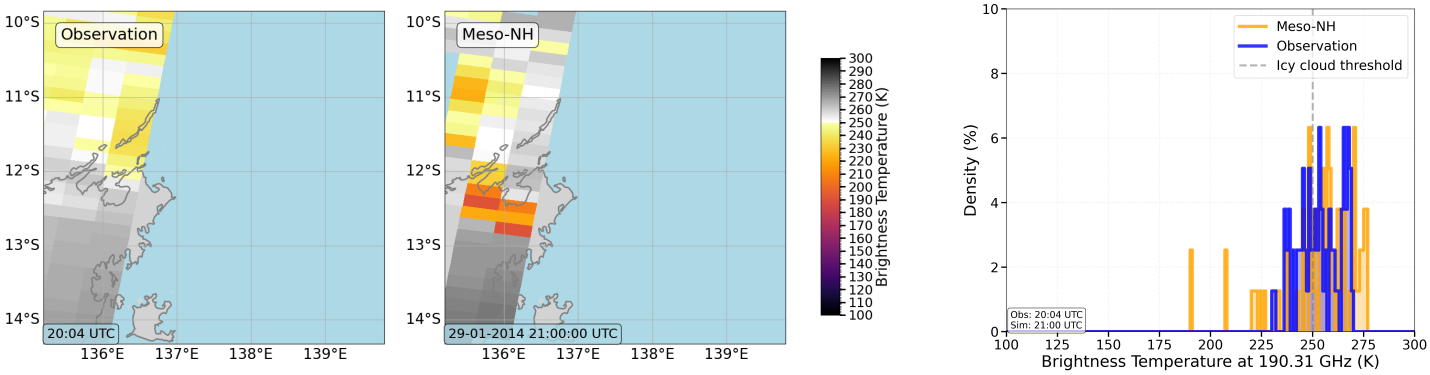
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F11

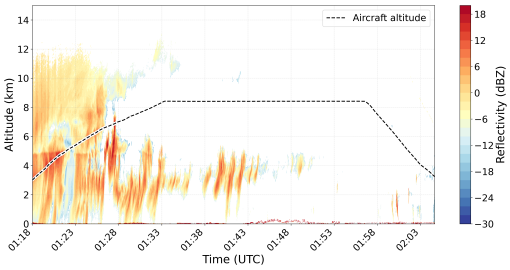
30/01/2014 00:30 ➔ 06:00

Convection type:

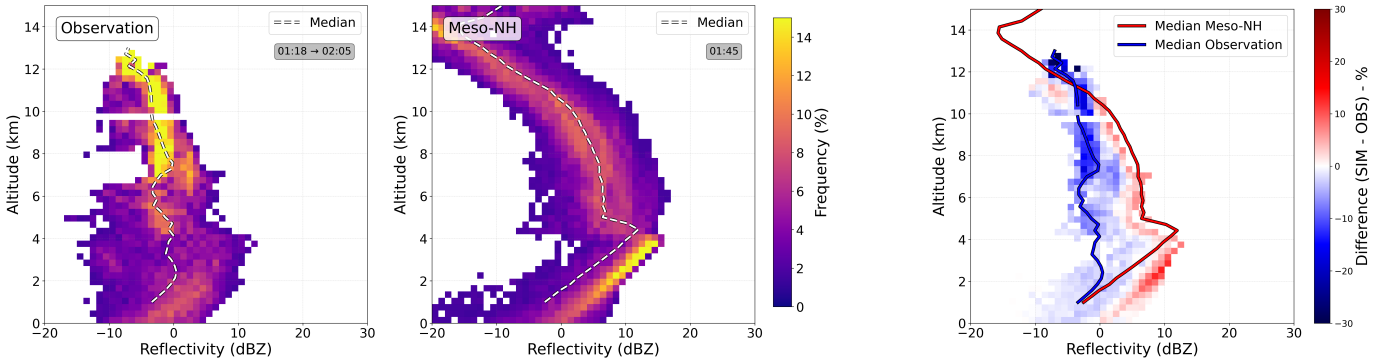
Mesoscale Convective System

1. KEY INDICATORS

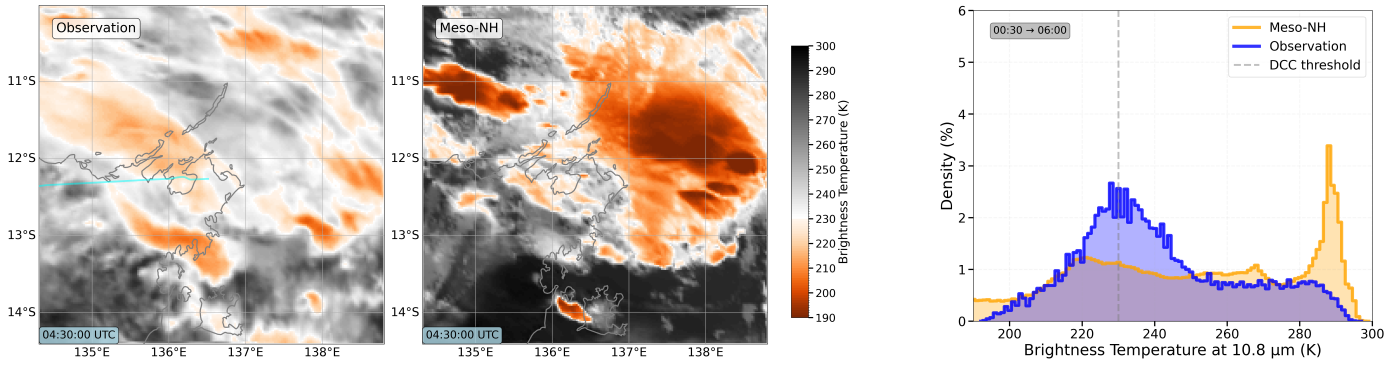
W max	**33.6 m/s**	IWP cover	**30.9%**	MTR bias	**7.4 dBZ**
dIWP/dt max	**1.33e-01 kg/m²/s**	IWP max	**43.1 kg/m²**	BT bias	**8.7 K**
# convec. columns	**40280**	DCC cover	**31.6%**	DCC bias	**-4.0%**
# growing columns	**15298**	Icy cover	**14.0%**	Icy bias	**-4.6%**



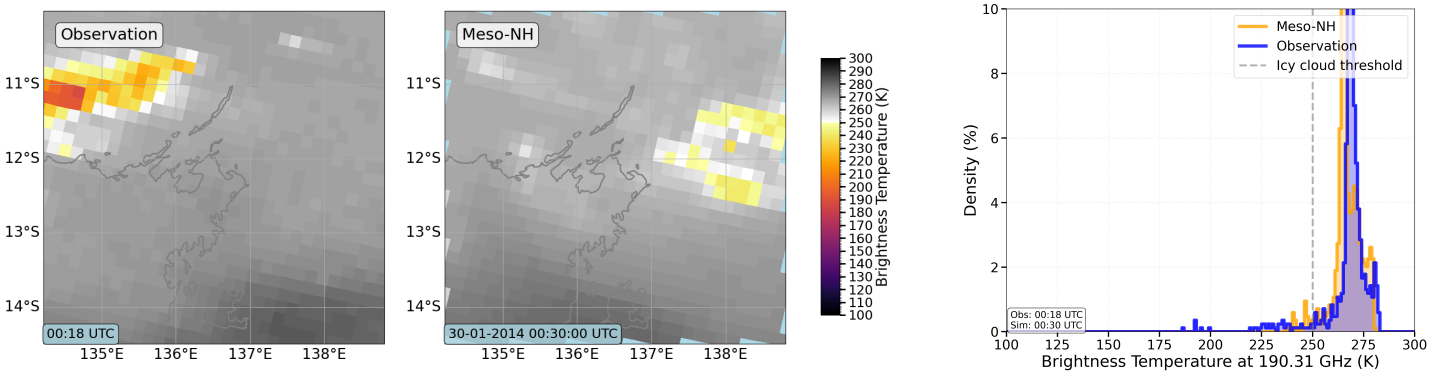
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F12

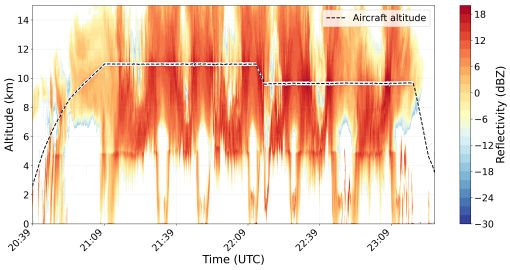
02/02/2014 20:00 ➔ 01:30

Convection type:

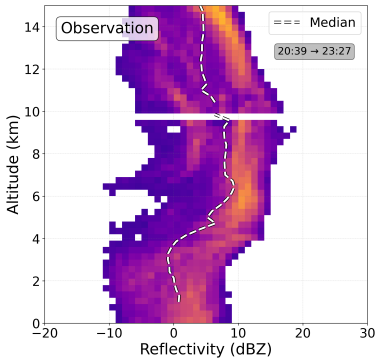
Mesoscale Convective System

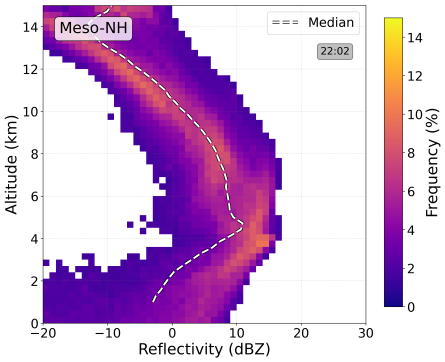
1. KEY INDICATORS

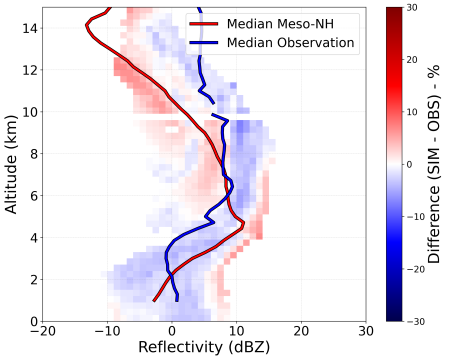
W max	**43.2 m/s**	IWP cover	**35.8%**	MTR bias	**-0.9 dBZ**
dIWP/dt max	**2.34e-01 kg/m²/s**	IWP max	**44.1 kg/m²**	BT bias	**10.7 K**
# convec. columns	**80992**	DCC cover	**43.4%**	DCC bias	**-10.0%**
# growing columns	**24671**	Icy cover	**16.6%**	Icy bias	**-39.3%**



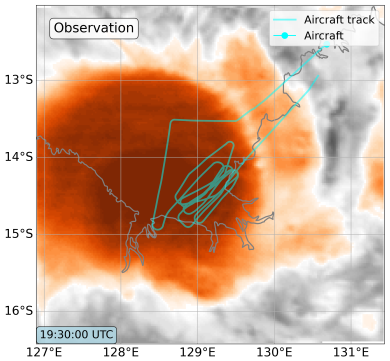
2. RADAR REFLECTIVITY - 95 GHz (RASTA)

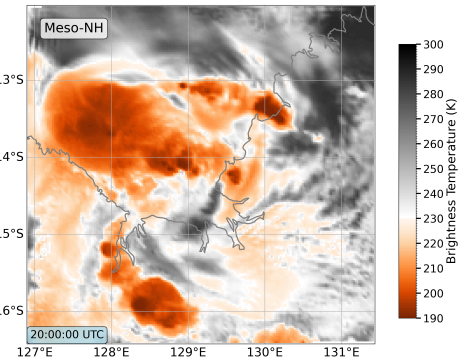


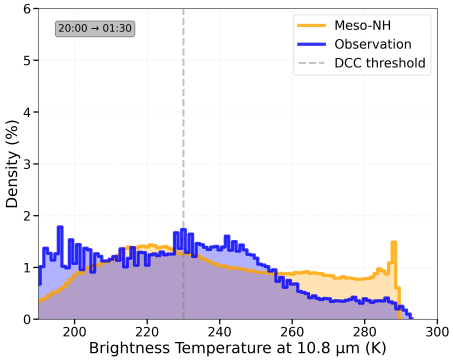




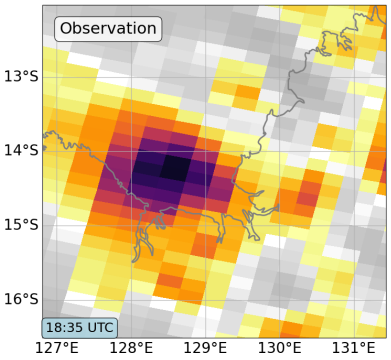
3. INFRARED - 10.8 µm

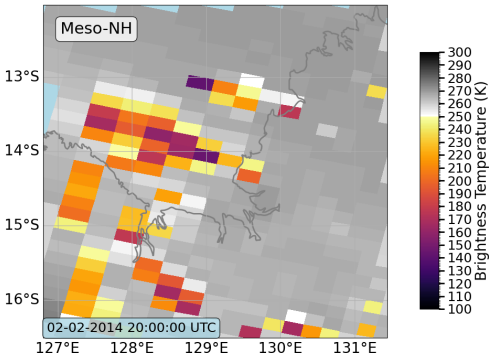


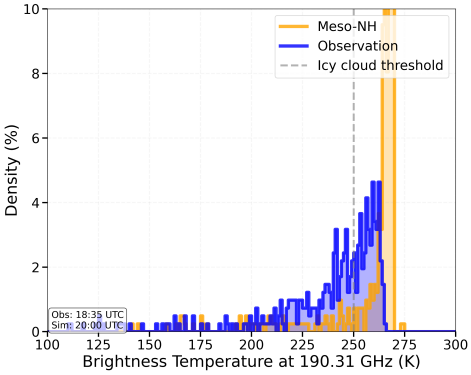




4. MHS - 190.31 GHz







HAIC-DARWIN - F13

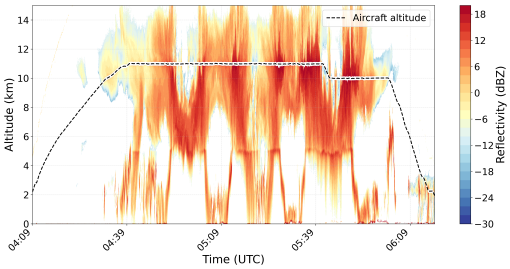
03/02/2014 04:00 ➔ 09:30

Convection type:

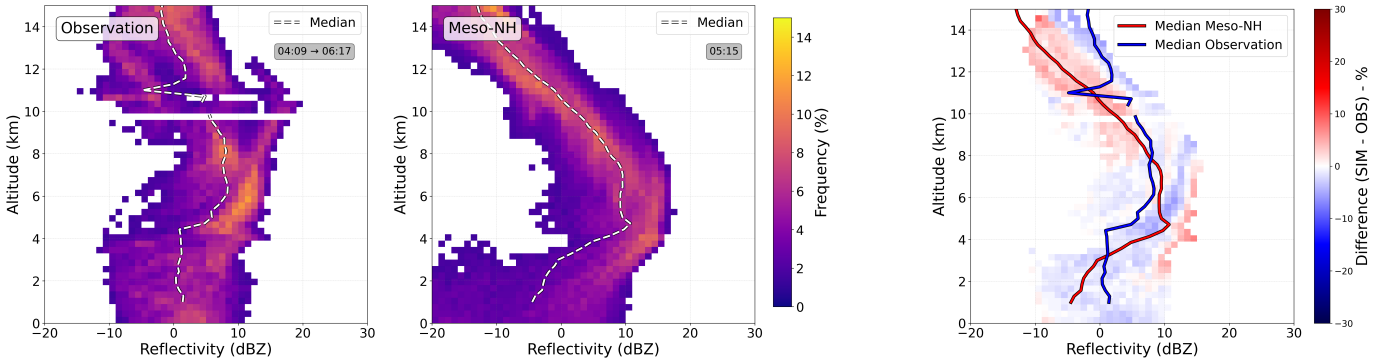
Mesoscale Convective System

1. KEY INDICATORS

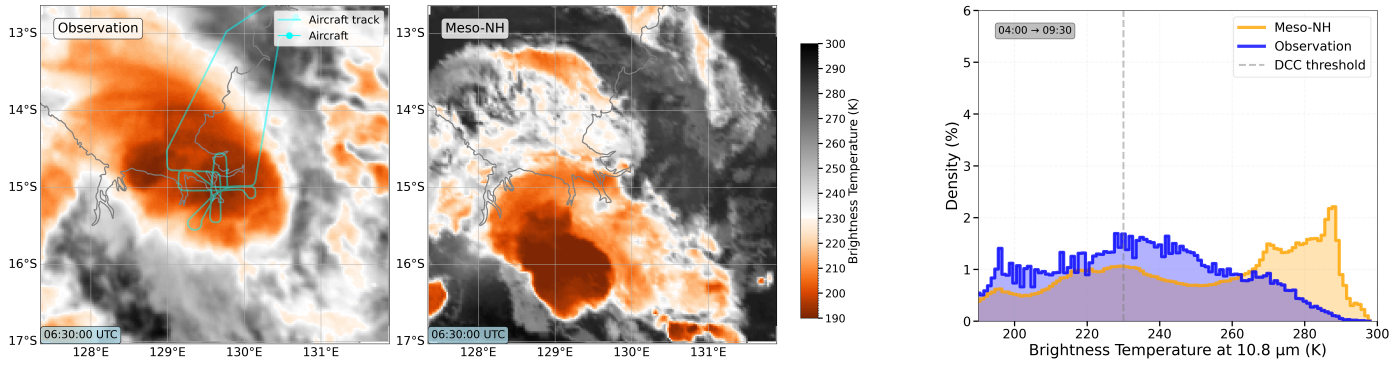
W max	**36.8 m/s**	IWP cover	**32.1%**	MTR bias	**0.3 dBZ**
dIWP/dt max	**1.85e-01 kg/m²/s**	IWP max	**47.3 kg/m²**	BT bias	**15.8 K**
# convec. columns	**47293**	DCC cover	**30.8%**	DCC bias	**-12.6%**
# growing columns	**14263**	Icy cover	**10.9%**	Icy bias	**-1.6%**



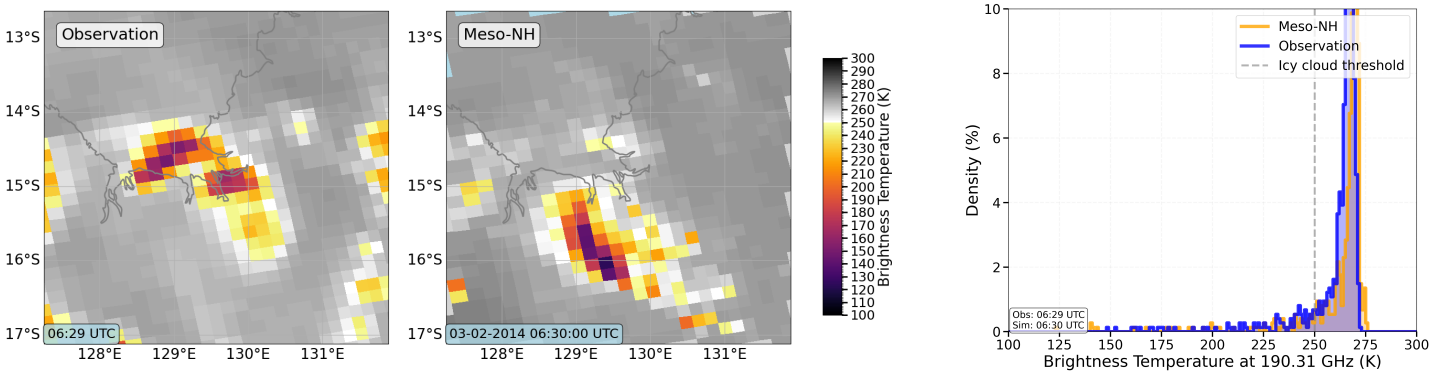
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F14

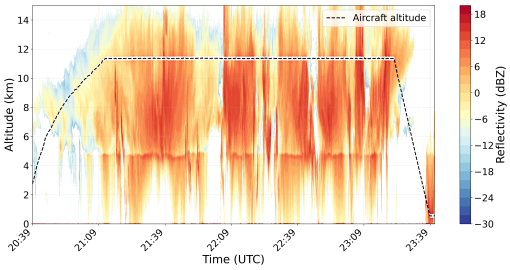
04/02/2014 20:00 ➔ 01:30

Convection type:

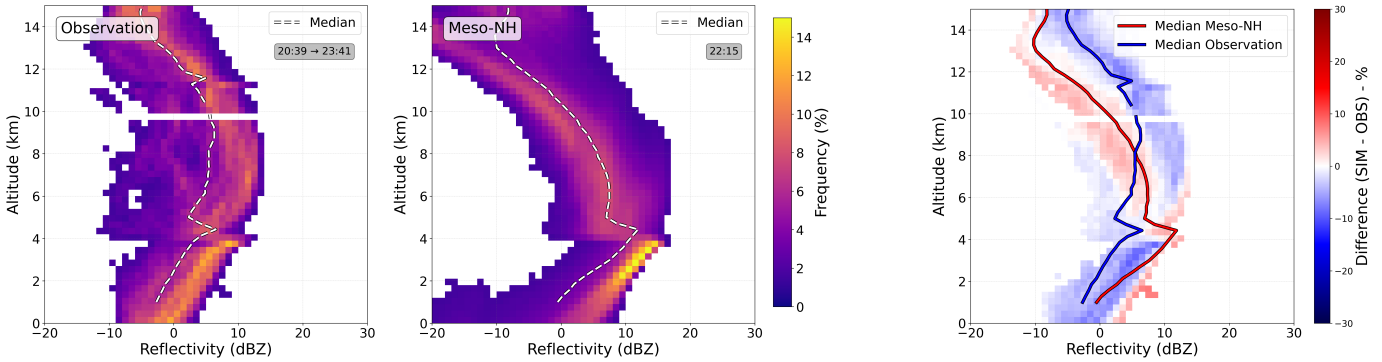
Mesoscale Convective System

1. KEY INDICATORS

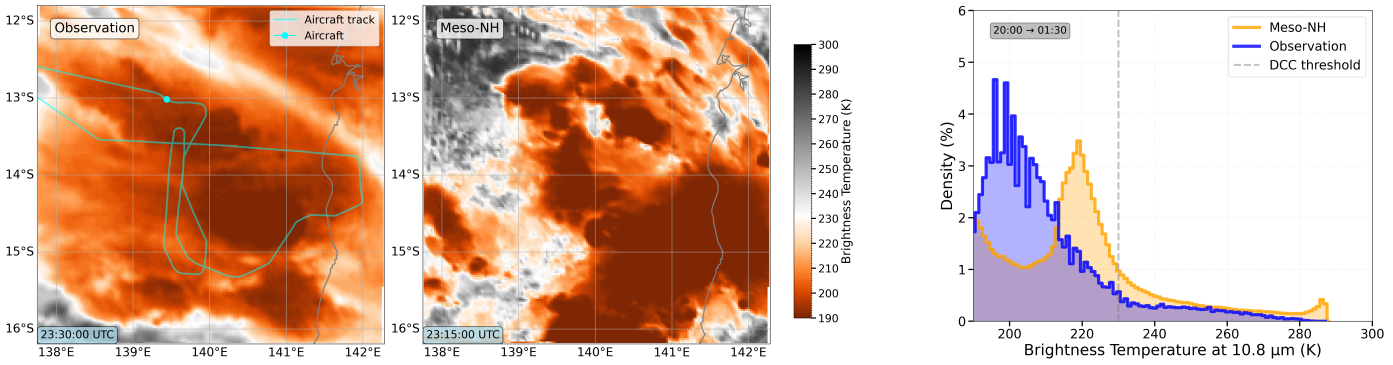
W max	**47.1 m/s**	IWP cover	**50.1%**	MTR bias	**0.7 dBZ**
dIWP/dt max	**2.20e-01 kg/m²/s**	IWP max	**54.6 kg/m²**	BT bias	**8.4 K**
# convec. columns	**168376**	DCC cover	**80.0%**	DCC bias	**-10.1%**
# growing columns	**50788**	Icy cover	**53.5%**	Icy bias	**-34.1%**



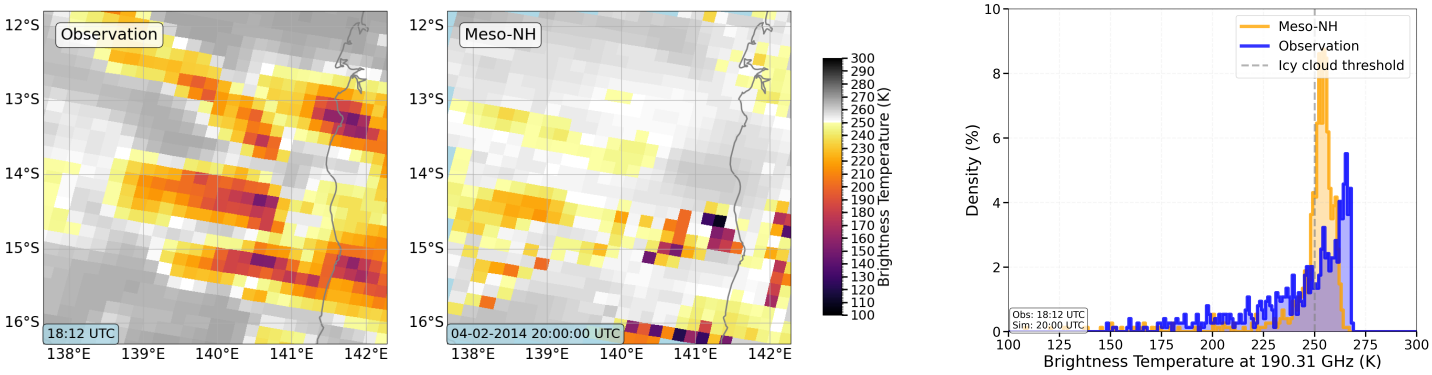
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F15

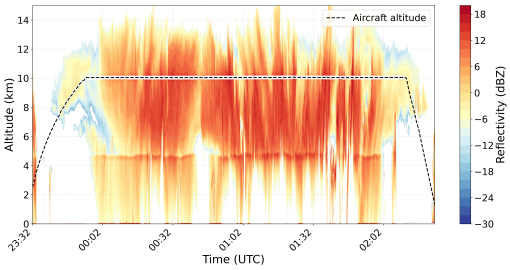
05/02/2014 00:30 ➔ 06:00

Convection type:

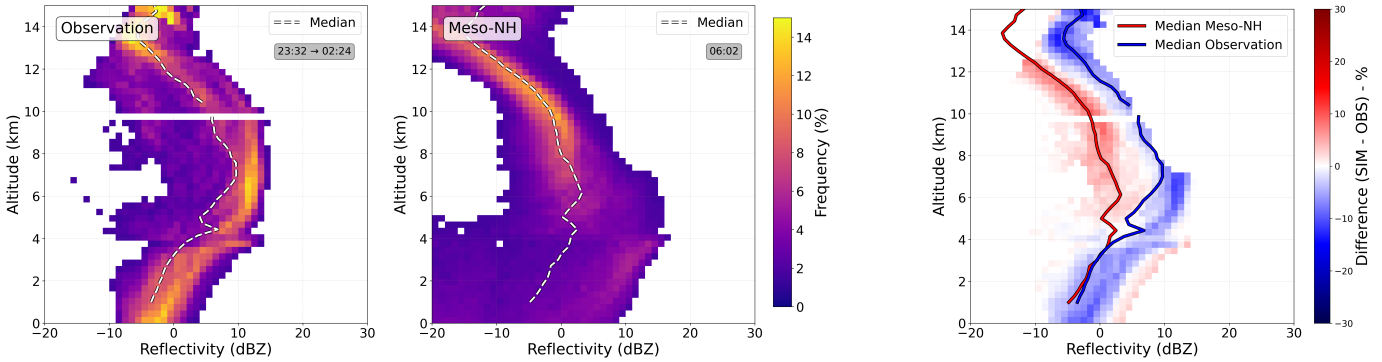
Isolated Cells

1. KEY INDICATORS

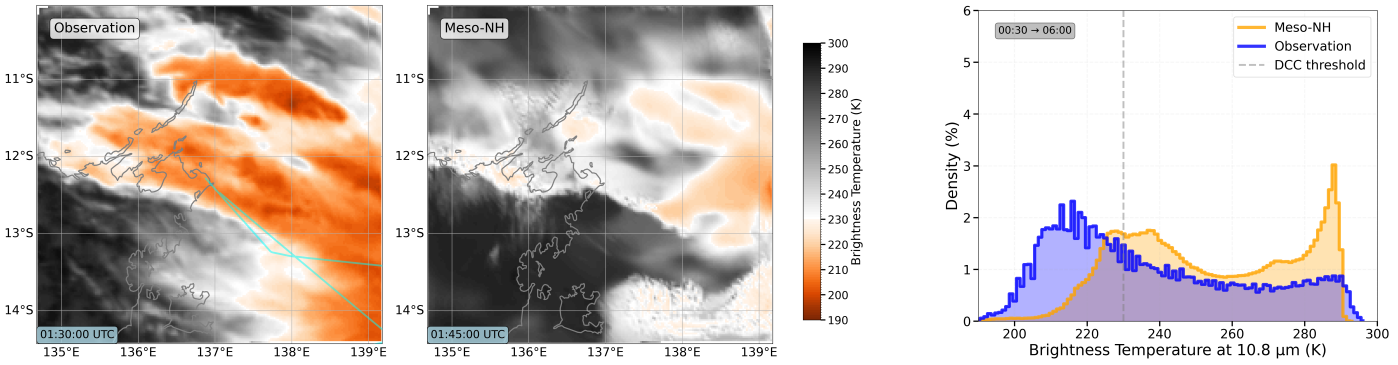
W max	**42.1 m/s**	IWP cover	**4.6%**	MTR bias	**-6.7 dBZ**
dIWP/dt max	**1.74e-01 kg/m²/s**	IWP max	**43.8 kg/m²**	BT bias	**15.8 K**
# convec. columns	**11764**	DCC cover	**19.9%**	DCC bias	**-28.5%**
# growing columns	**6356**	Icy cover	**5.4%**	Icy bias	**-1.8%**



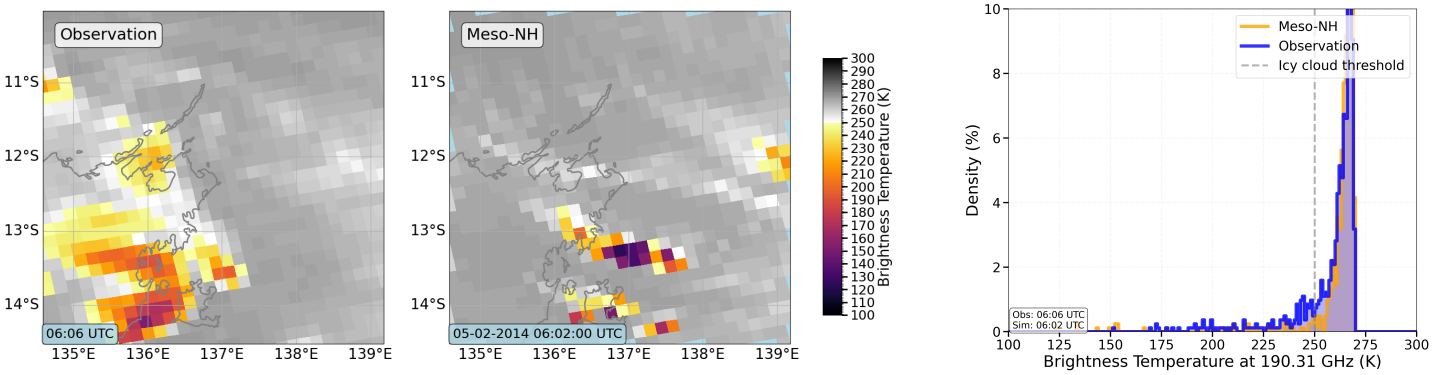
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F16

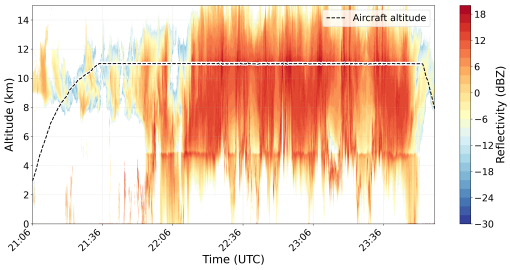
07/02/2014 20:00 ➔ 01:30

Convection type:

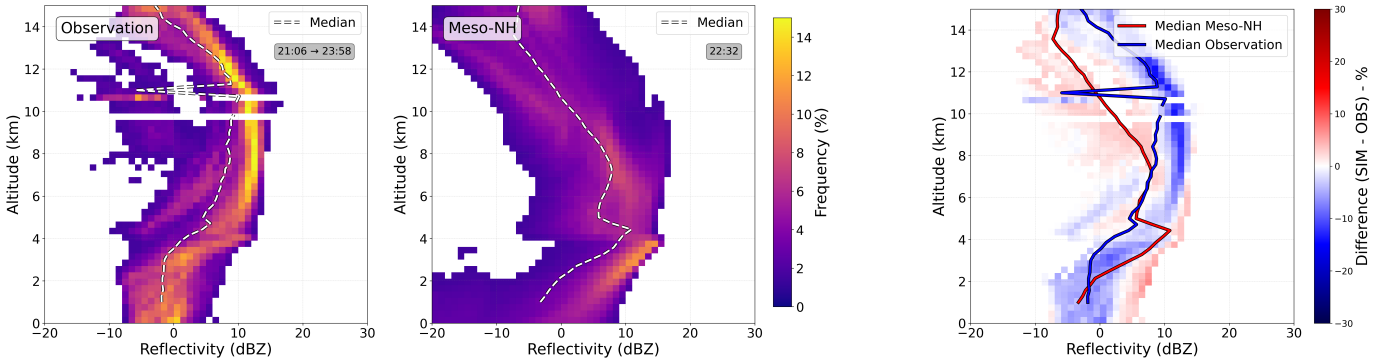
Mesoscale Convective System

1. KEY INDICATORS

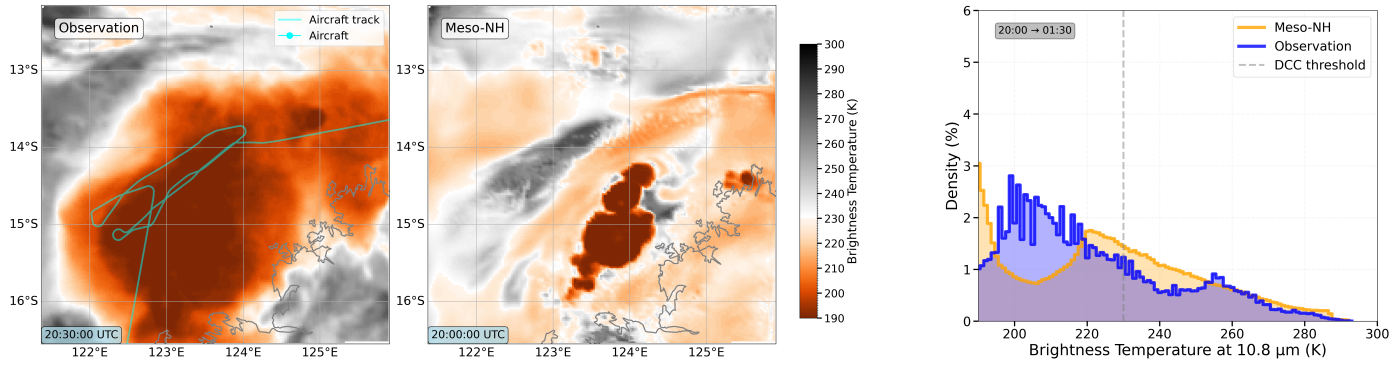
W max	**52.3 m/s**	IWP cover	**35.1%**	MTR bias	**-1.7 dBZ**
dIWP/dt max	**2.85e-01 kg/m²/s**	IWP max	**56.3 kg/m²**	BT bias	**5.3 K**
# convec. columns	**97315**	DCC cover	**59.7%**	DCC bias	**-12.7%**
# growing columns	**23930**	Icy cover	**13.2%**	Icy bias	**-20.5%**



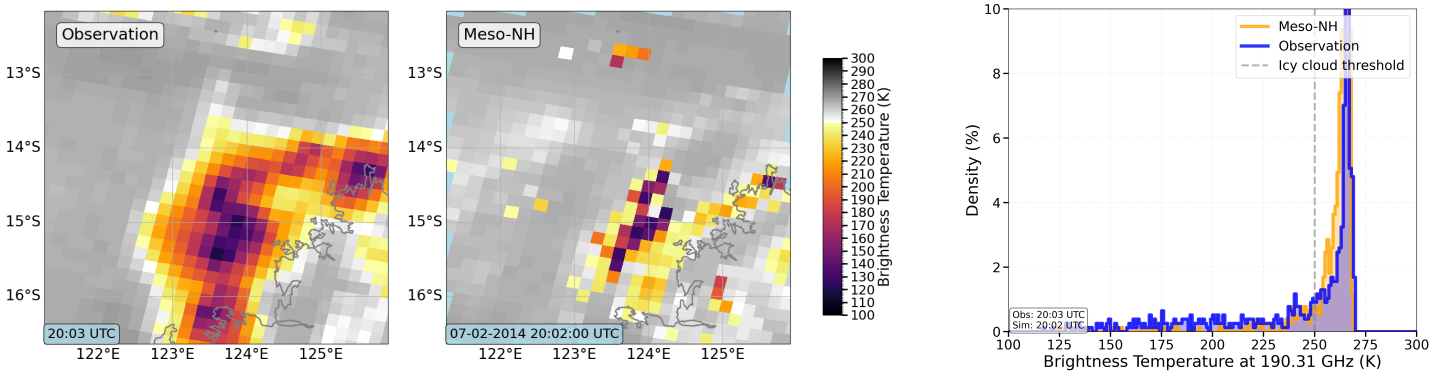
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F17

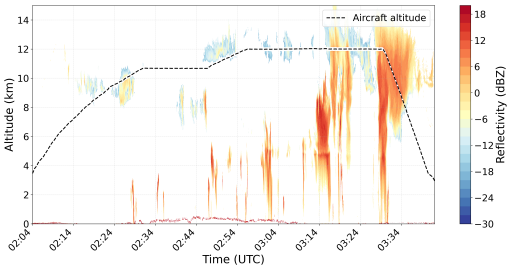
08/02/2014 00:30 ➔ 06:00

Convection type:

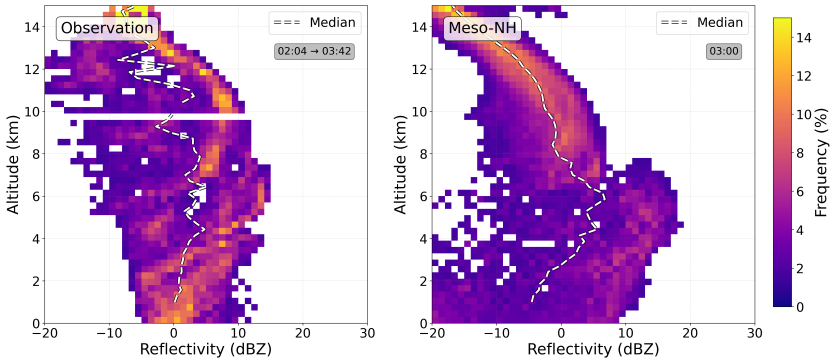
Mesoscale Convective System

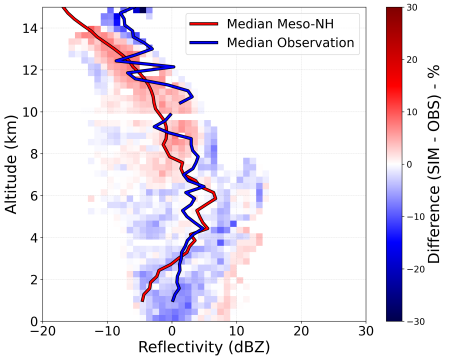
1. KEY INDICATORS

W max	**46.7 m/s**	IWP cover	**10.3%**	MTR bias	**-0.3 dBZ**
dIWP/dt max	**2.00e-01 kg/m²/s**	IWP max	**43.5 kg/m²**	BT bias	**16.8 K**
# convec. columns	**26870**	DCC cover	**17.3%**	DCC bias	**-21.1%**
# growing columns	**13485**	Icy cover	**1.7%**	Icy bias	**-8.6%**

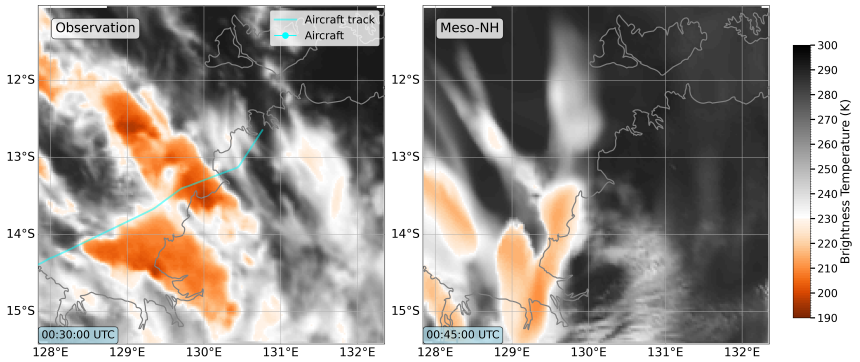


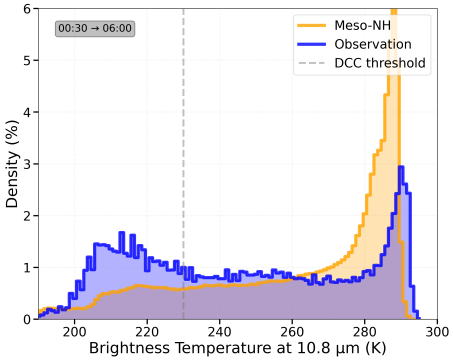
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



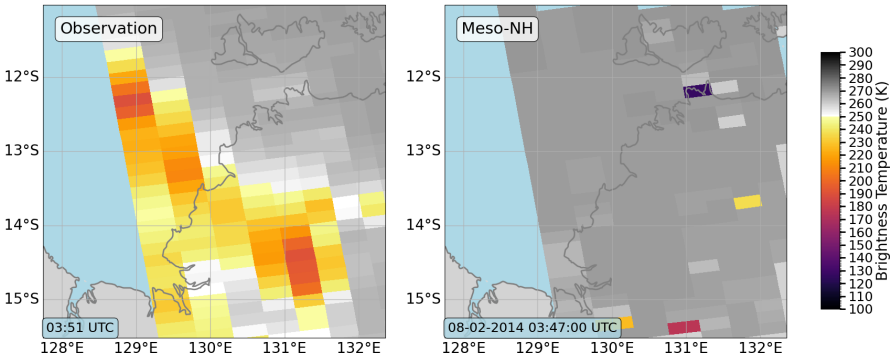


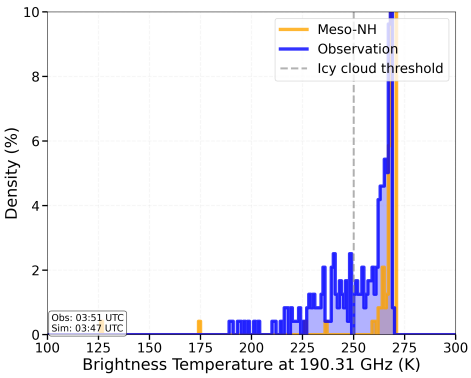
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-DARWIN - F19

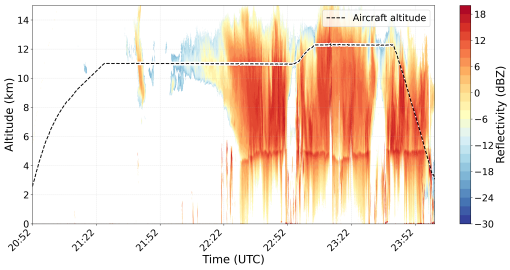
09/02/2014 20:00 ➔ 01:30

Convection type:

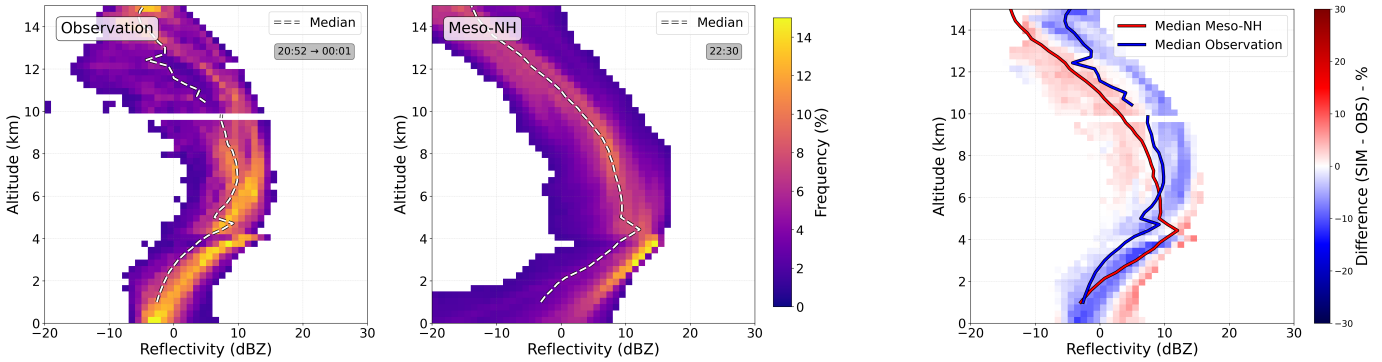
Mesoscale Convective System

1. KEY INDICATORS

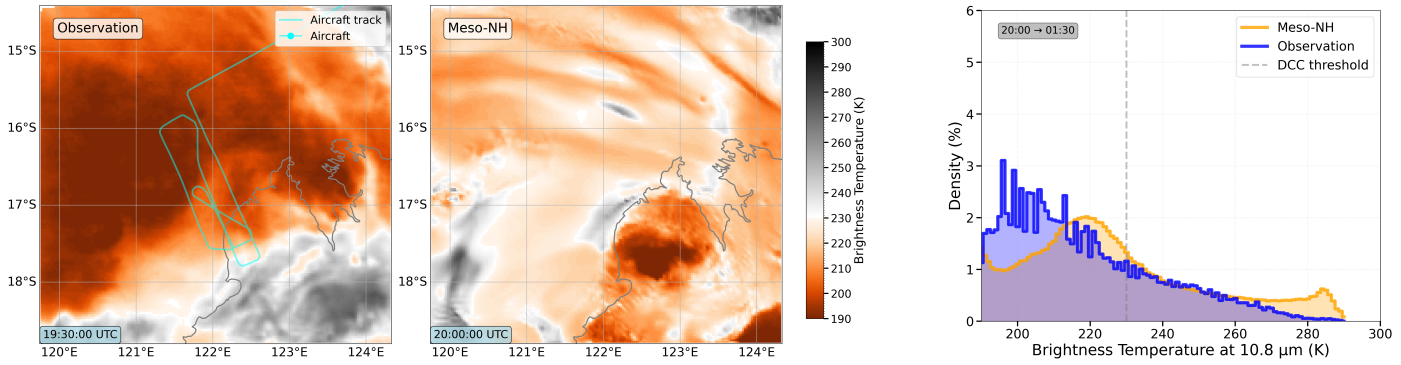
W max	**45.7 m/s**	IWP cover	**38.9%**	MTR bias	**-1.0 dBZ**
dIWP/dt max	**3.11e-01 kg/m²/s**	IWP max	**53.4 kg/m²**	BT bias	**9.2 K**
# convec. columns	**132297**	DCC cover	**64.6%**	DCC bias	**-11.7%**
# growing columns	**46818**	Icy cover	**18.6%**	Icy bias	**-39.5%**



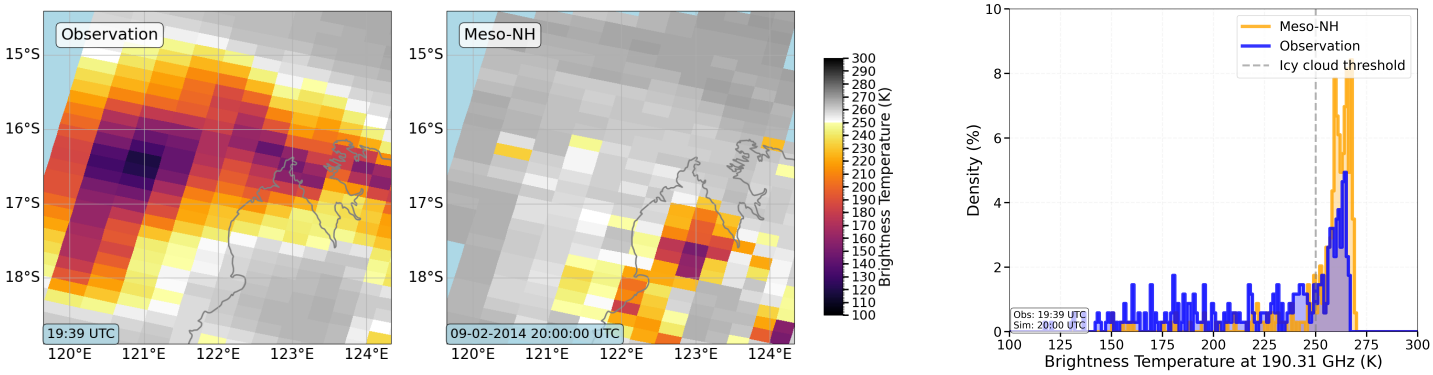
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F20

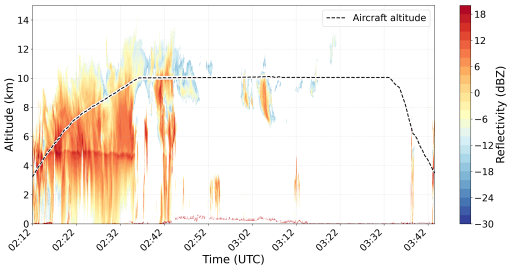
10/02/2014 00:30 ➔ 06:00

Convection type:

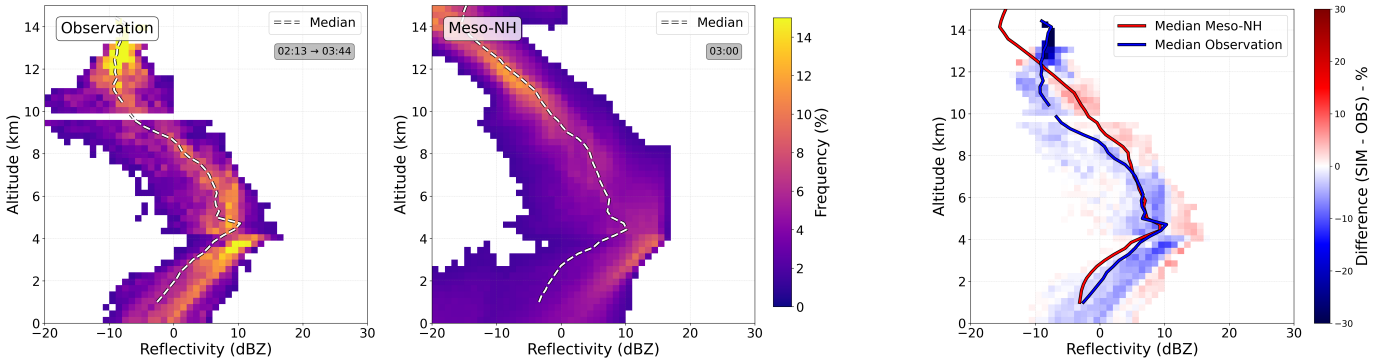
Mesoscale Convective System

1. KEY INDICATORS

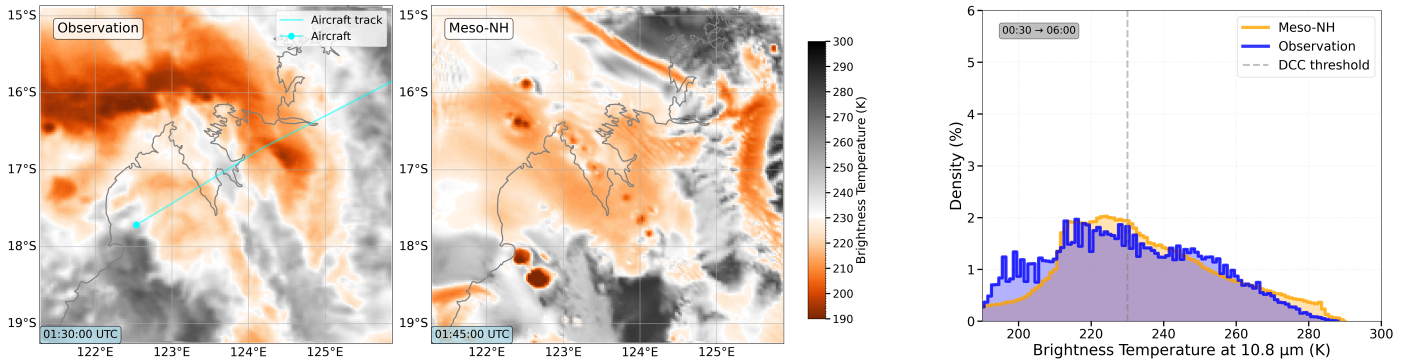
W max	**44.3 m/s**	IWP cover	**24.7%**	MTR bias	**1.7 dBZ**
dIWP/dt max	**3.73e-01 kg/m²/s**	IWP max	**49.2 kg/m²**	BT bias	**5.6 K**
# convec. columns	**59198**	DCC cover	**47.9%**	DCC bias	**-7.8%**
# growing columns	**24840**	Icy cover	**14.8%**	Icy bias	**-13.7%**



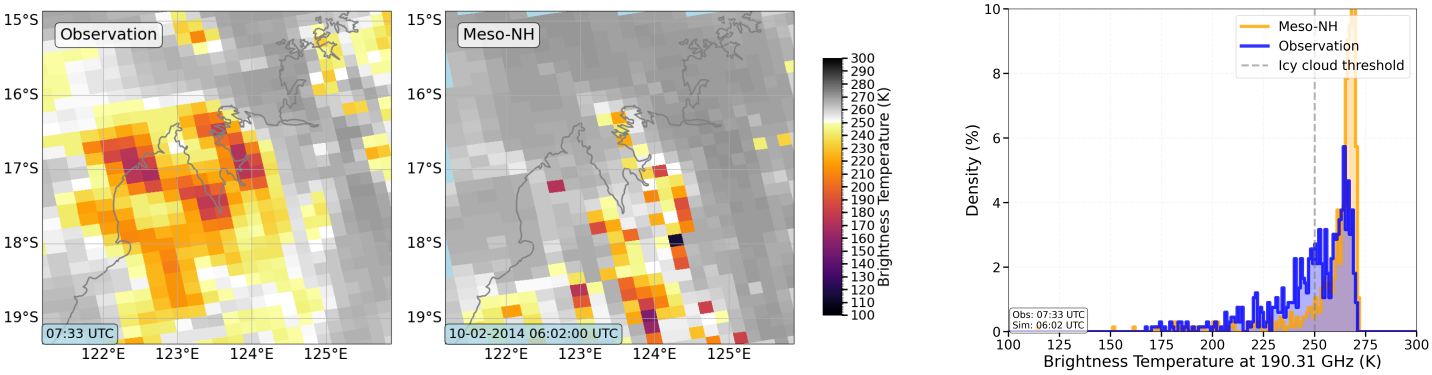
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



HAIC-DARWIN - F21

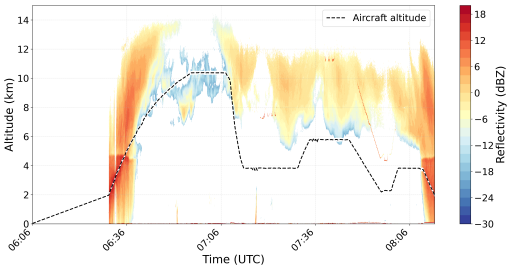
17/02/2014 06:30 ➔ 12:00

Convection type:

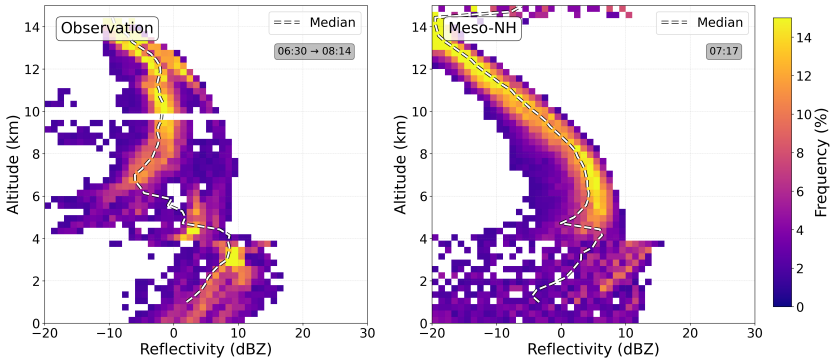
Mesoscale Convective System

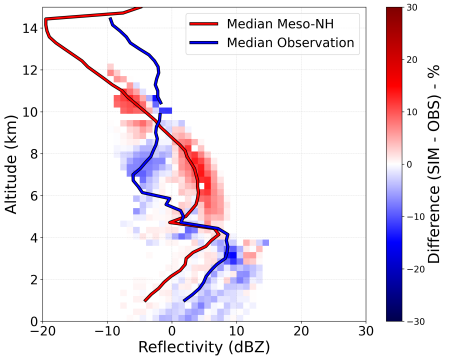
1. KEY INDICATORS

W max	**59.0 m/s**	IWP cover	**24.2%**	MTR bias	**4.6 dBZ**
dIWP/dt max	**2.20e-01 kg/m²/s**	IWP max	**59.1 kg/m²**	BT bias	**11.2 K**
# convec. columns	**77555**	DCC cover	**65.9%**	DCC bias	**-21.1%**
# growing columns	**28486**	Icy cover	**24.3%**	Icy bias	**-14.1%**

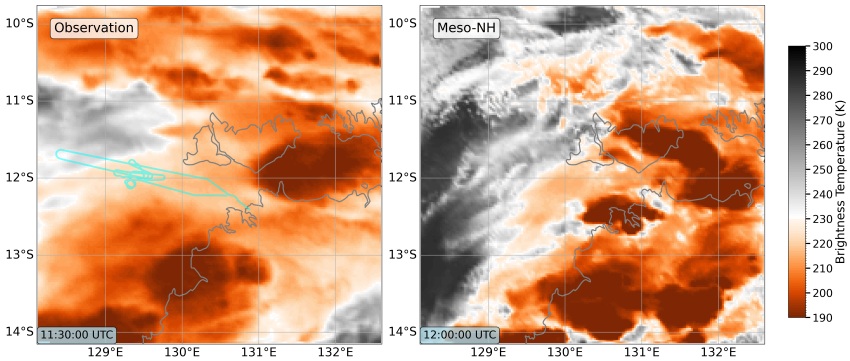


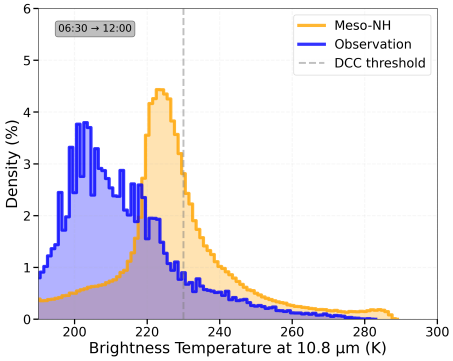
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



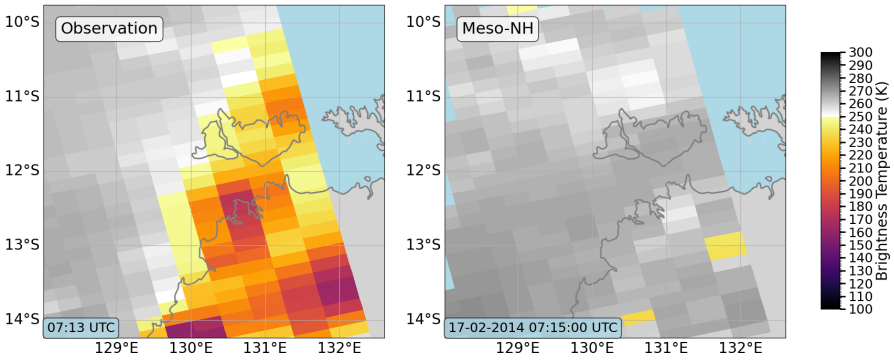


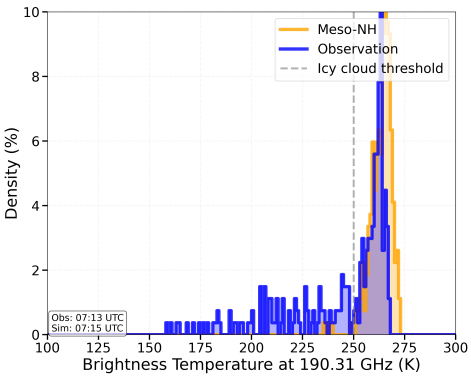
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-DARWIN - F22

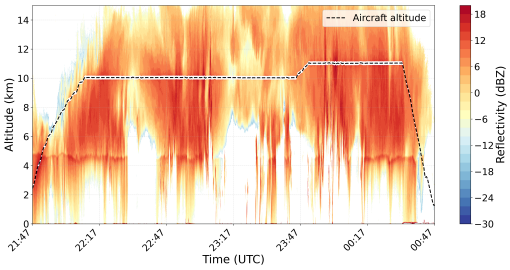
18/02/2014 00:00 ➔ 01:30

Convection type:

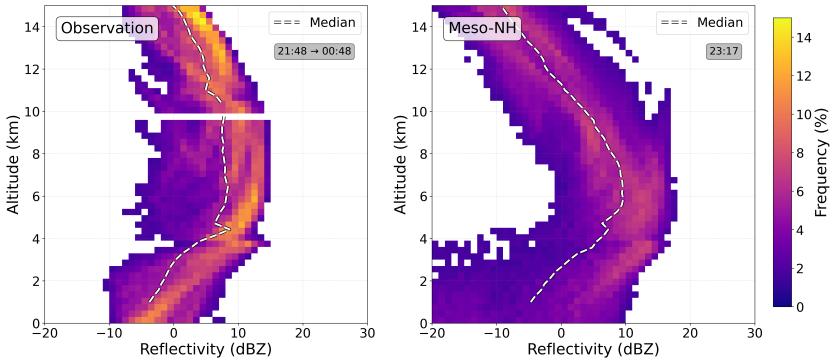
Mesoscale Convective System

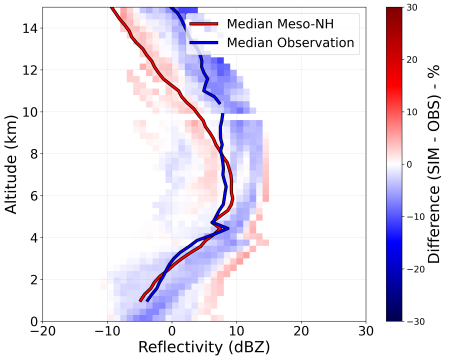
1. KEY INDICATORS

W max	**43.7 m/s**	IWP cover	**43.8%**	MTR bias	**0.1 dBZ**
dIWP/dt max	**2.16e-01 kg/m²/s**	IWP max	**57.4 kg/m²**	BT bias	**-3.6 K**
# convec. columns	**24372**	DCC cover	**28.9%**	DCC bias	**3.9%**
# growing columns	**5258**	Icy cover	**12.6%**	Icy bias	**-2.9%**

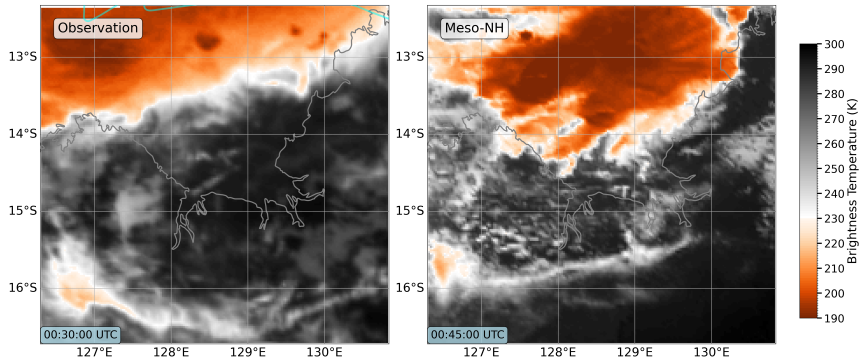


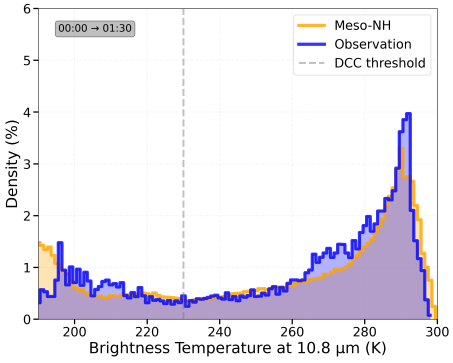
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



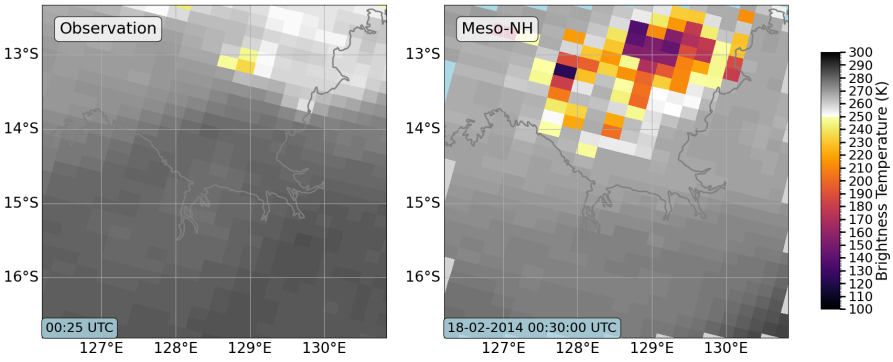


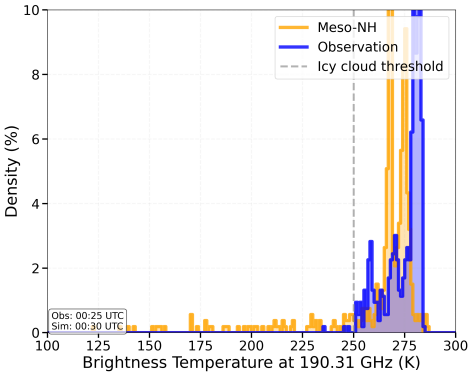
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





HAIC-DARWIN - F23

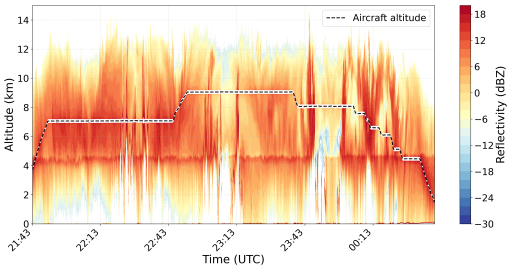
18/02/2014 20:00 ➔ 23:45

Convection type:

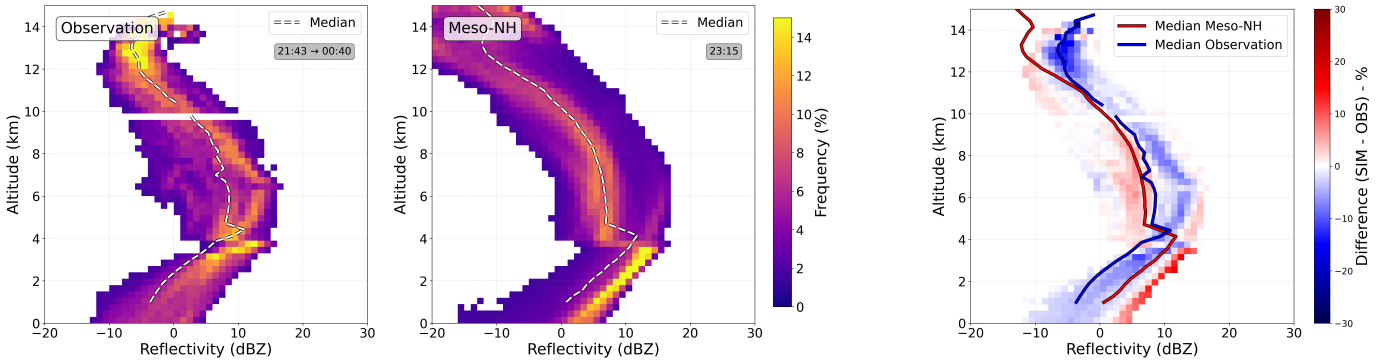
Mesoscale Convective System

1. KEY INDICATORS

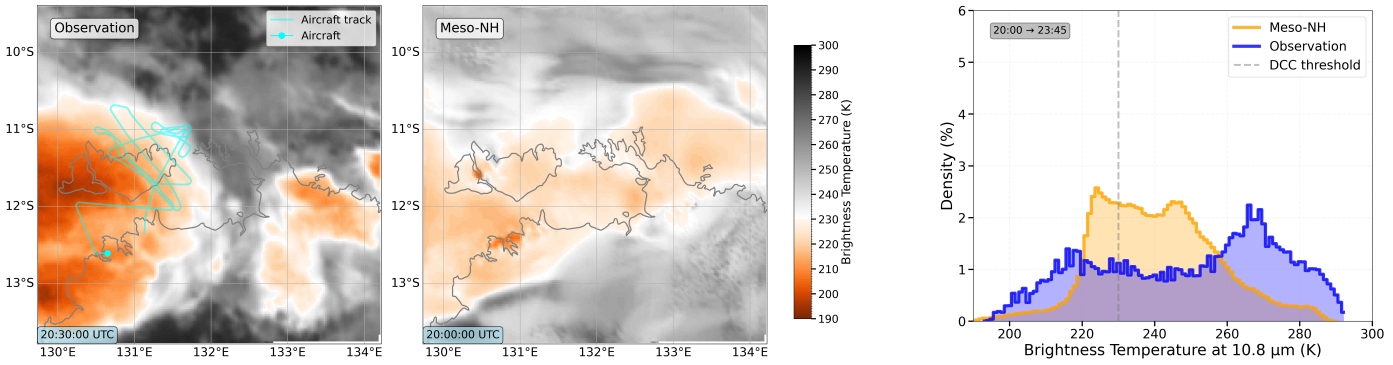
W max	**33.5 m/s**	IWP cover	**28.0%**	MTR bias	**-1.4 dBZ**
dIWP/dt max	**1.99e-01 kg/m²/s**	IWP max	**45.6 kg/m²**	BT bias	**-9.0 K**
# convec. columns	**22868**	DCC cover	**28.6%**	DCC bias	**2.1%**
# growing columns	**7303**	Icy cover	**5.9%**	Icy bias	**-26.4%**



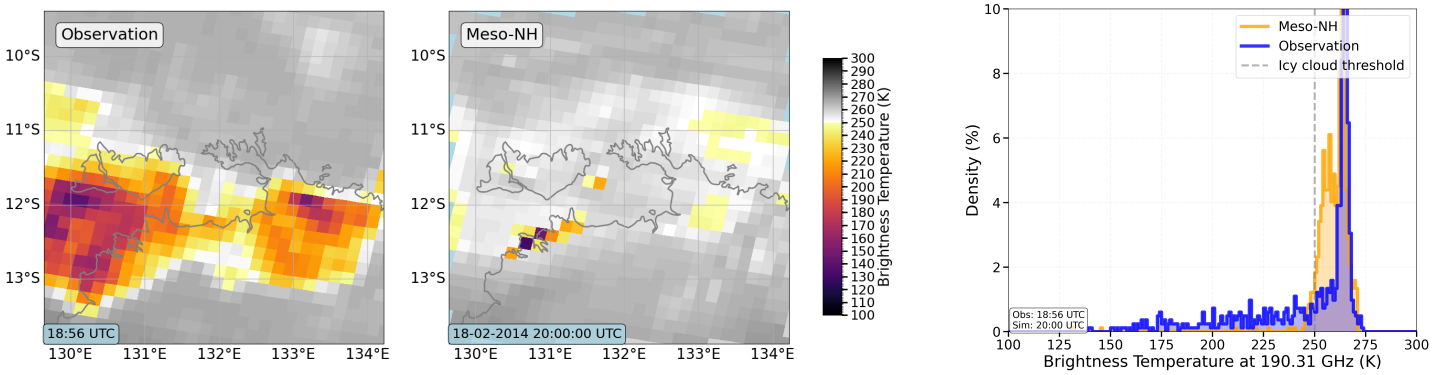
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



EXAEDRE - F15

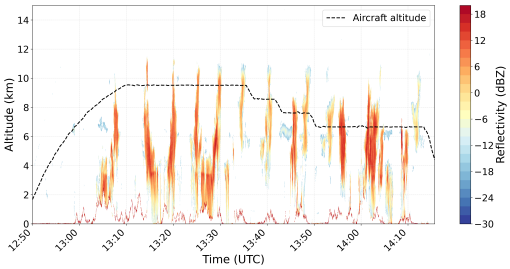
13/09/2018 12:28 → 17:58

Convection type:

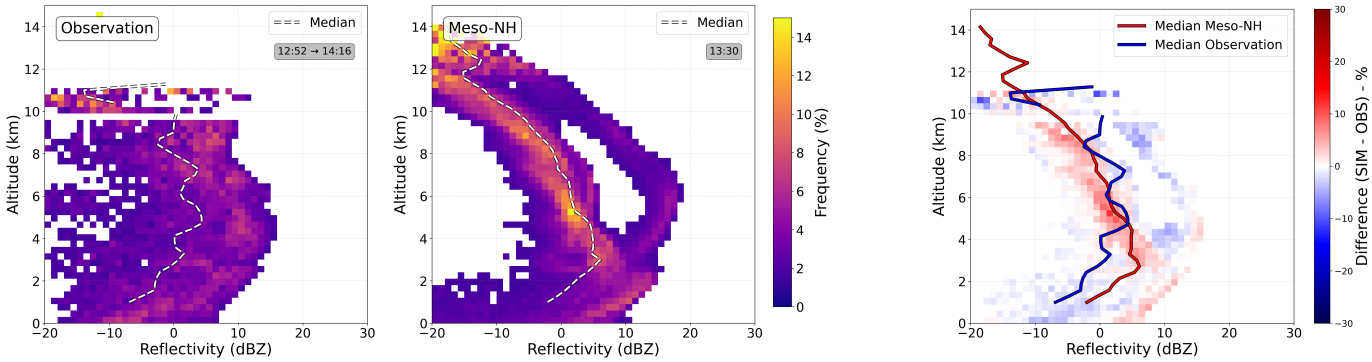
Mesoscale Convective System

1. KEY INDICATORS

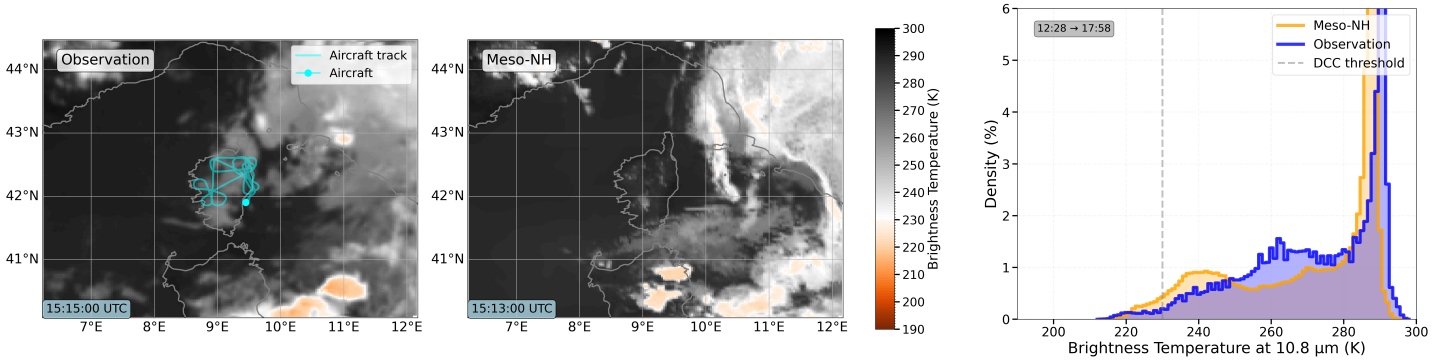
W max	**33.2 m/s**	IWP cover	**9.8%**	MTR bias	**-2.1 dBZ**
dIWP/dt max	**1.86e-01 kg/m²/s**	IWP max	**33.5 kg/m²**	BT bias	**-2.8 K**
# convec. columns	**9203**	DCC cover	**3.0%**	DCC bias	**1.4%**
# growing columns	**3317**	Icy cover	**1.5%**	Icy bias	**-0.6%**



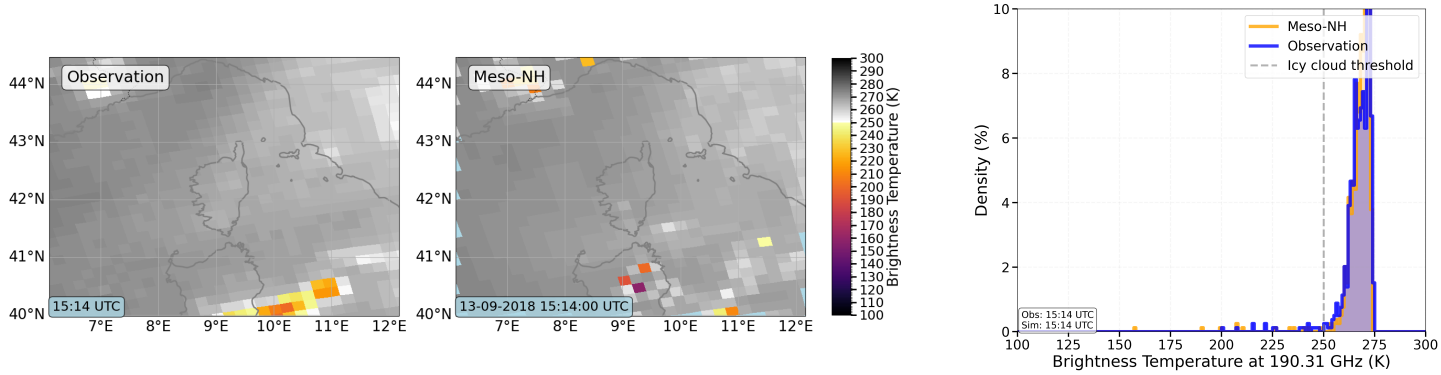
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



EXAEDRE - F16

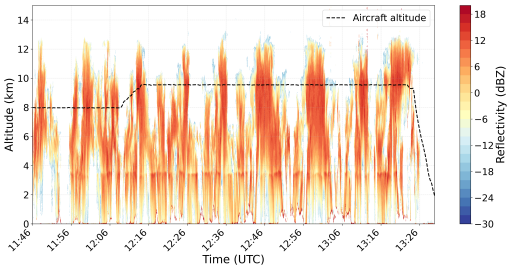
17/09/2018 09:58 → 15:28

Convection type:

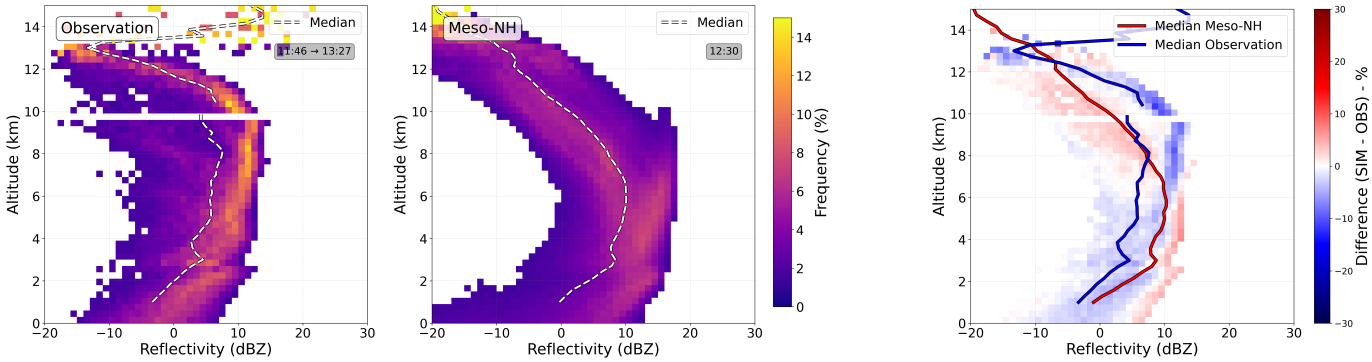
Mesoscale Convective System

1. KEY INDICATORS

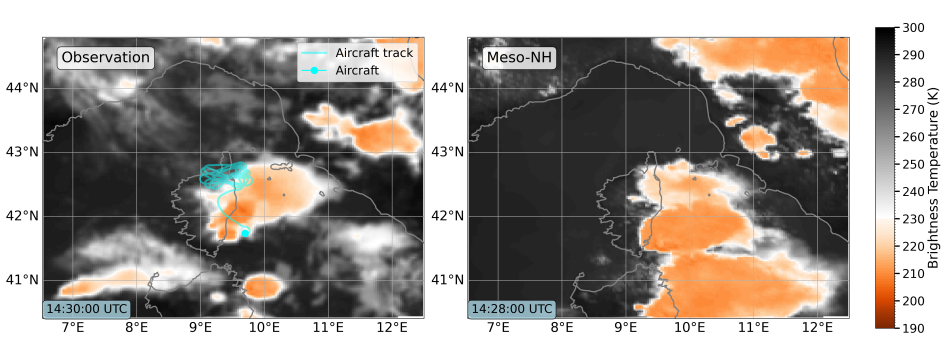
W max	**45.4 m/s**	IWP cover	**43.8%**	MTR bias	**1.7 dBZ**
dIWP/dt max	**2.58e-01 kg/m²/s**	IWP max	**58.4 kg/m²**	BT bias	**-2.1 K**
# convec. columns	**47981**	DCC cover	**15.5%**	DCC bias	**8.6%**
# growing columns	**14499**	Icy cover	**12.4%**	Icy bias	**0.2%**

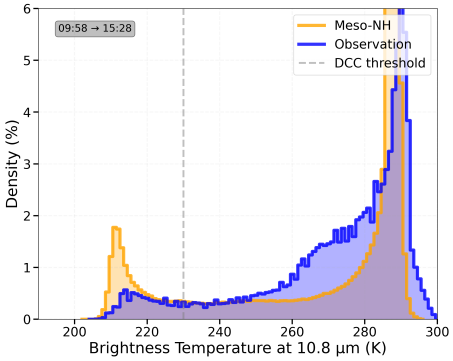


2. RADAR REFLECTIVITY - 95 GHz (RASTA)

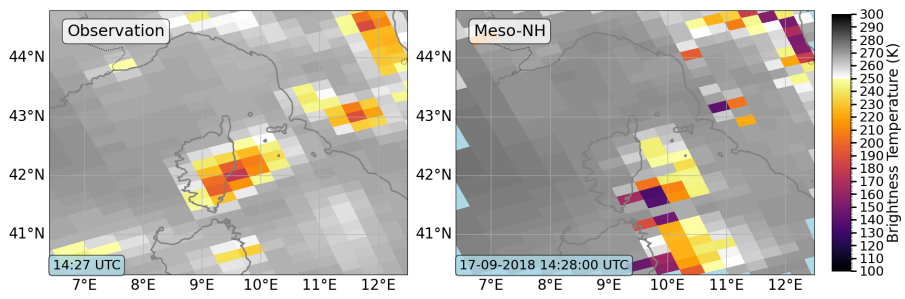


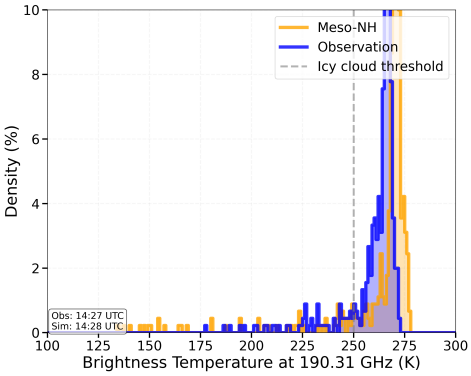
3. INFRARED - 10.8 µm





4. MHS - 190.31 GHz





EXAEDRE - F17

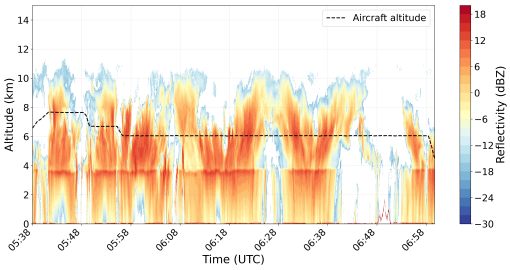
19/09/2018 03:58 → 09:28

Convection type:

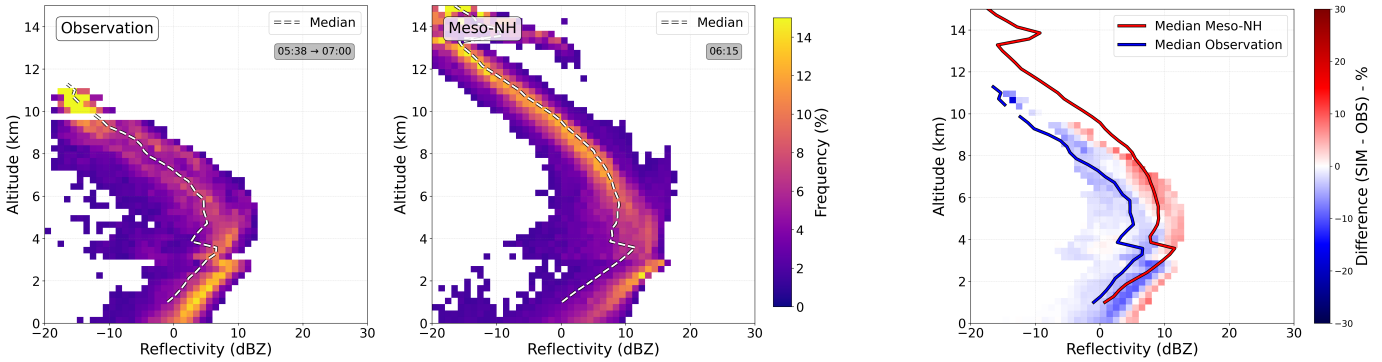
Mesoscale Convective System

1. KEY INDICATORS

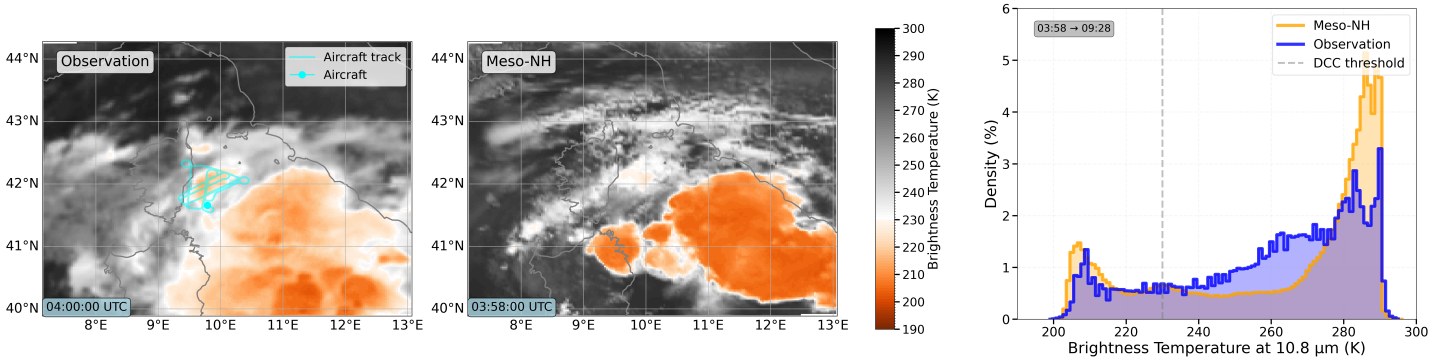
W max	**45.9 m/s**	IWP cover	**38.8%**	MTR bias	**7.4 dBZ**
dIWP/dt max	**2.09e-01 kg/m²/s**	IWP max	**51.8 kg/m²**	BT bias	**3.8 K**
# convec. columns	**36827**	DCC cover	**21.7%**	DCC bias	**3.4%**
# growing columns	**8542**	Icy cover	**10.2%**	Icy bias	**-4.2%**



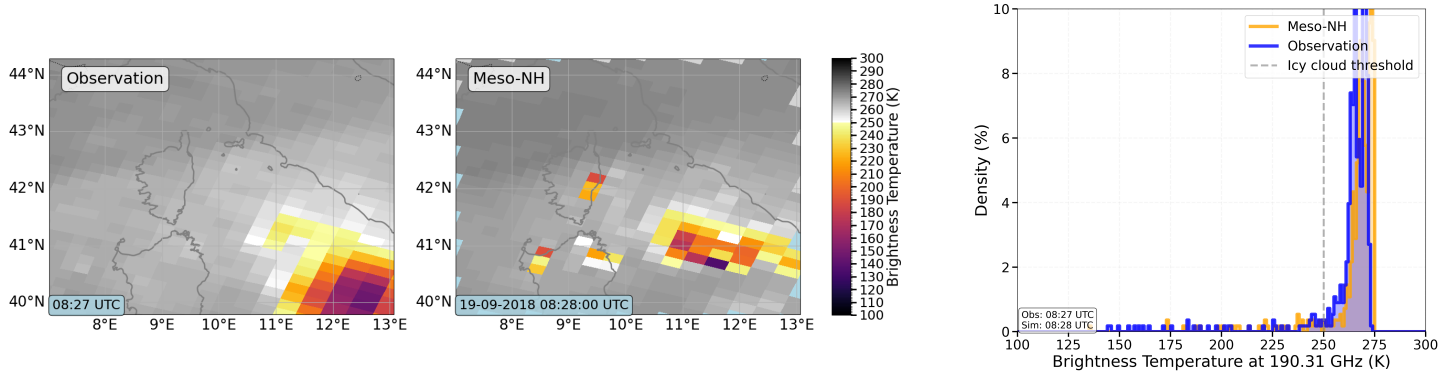
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



EXAEDRE - F18

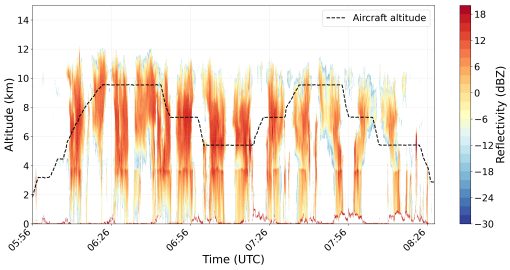
20/09/2018 03:58 → 09:28

Convection type:

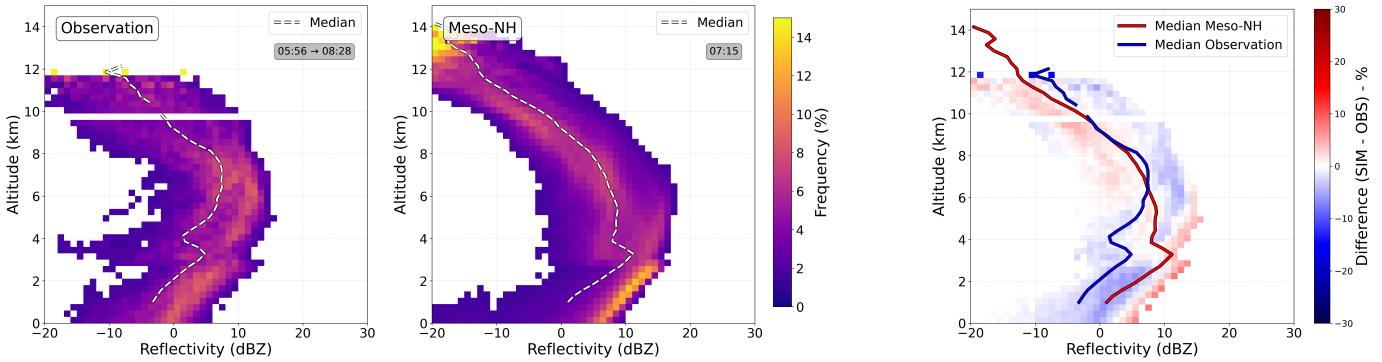
Mesoscale Convective System

1. KEY INDICATORS

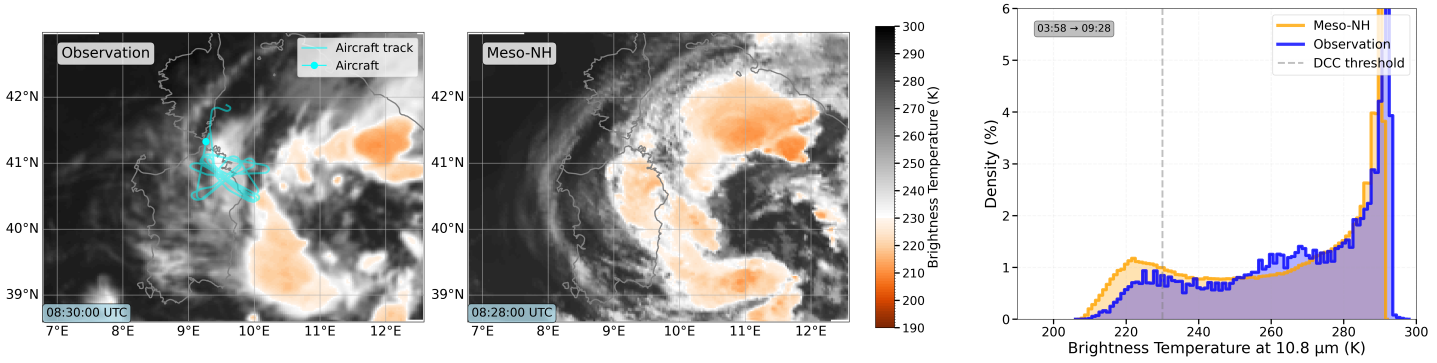
W max	**31.1 m/s**	IWP cover	**36.2%**	MTR bias	**0.0 dBZ**
dIWP/dt max	**2.26e-01 kg/m²/s**	IWP max	**39.5 kg/m²**	BT bias	**-6.7 K**
# convec. columns	**32418**	DCC cover	**17.5%**	DCC bias	**7.6%**
# growing columns	**10655**	Icy cover	**9.7%**	Icy bias	**-1.6%**



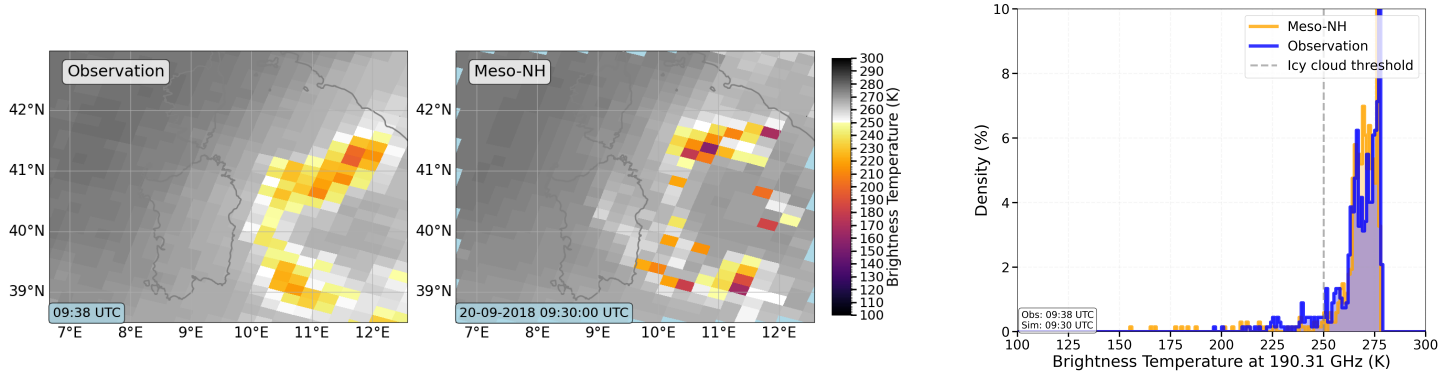
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



EXAEDRE - F19

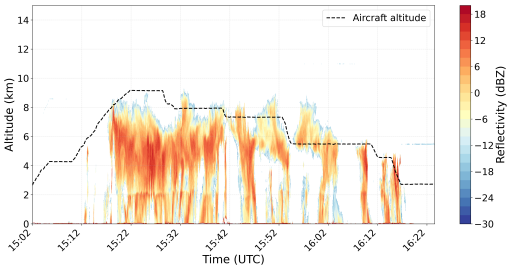
01/10/2018 13:58 → 19:28

Convection type:

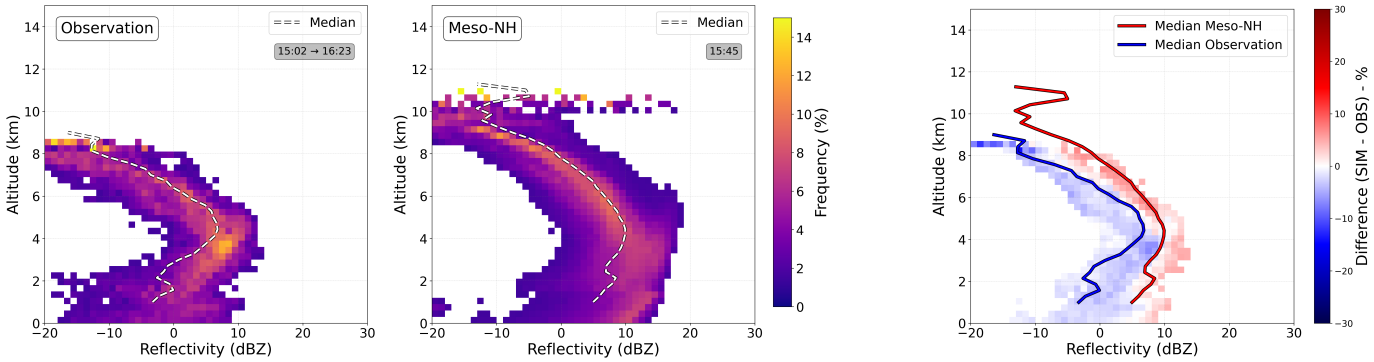
Mesoscale Convective System

1. KEY INDICATORS

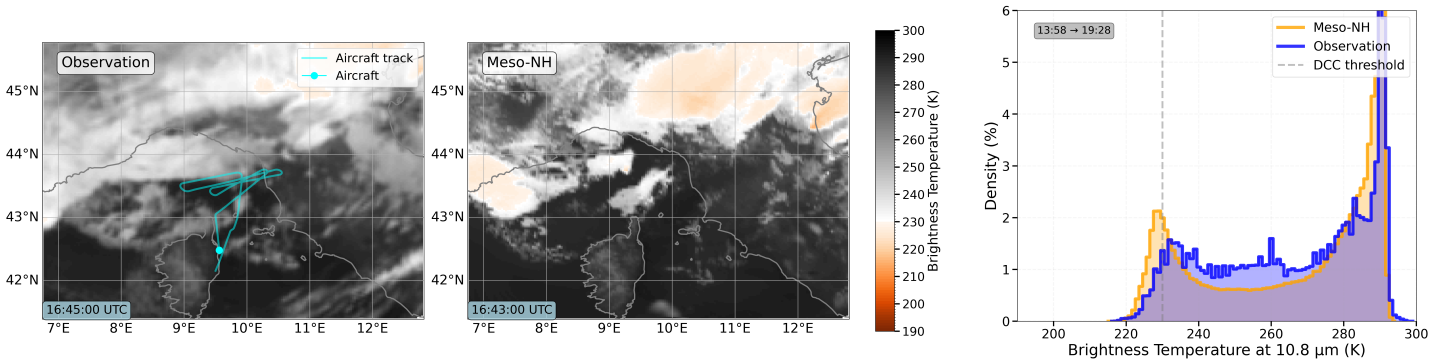
W max	**39.2 m/s**	IWP cover	**36.7%**	MTR bias	**6.6 dBZ**
dIWP/dt max	**2.35e-01 kg/m²/s**	IWP max	**36.1 kg/m²**	BT bias	**1.4 K**
# convec. columns	**39965**	DCC cover	**9.5%**	DCC bias	**6.1%**
# growing columns	**9870**	Icy cover	**0.0%**	Icy bias	**0.0%**



2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz

No MHS 190 GHz comparison available

EXAEDRE - F20

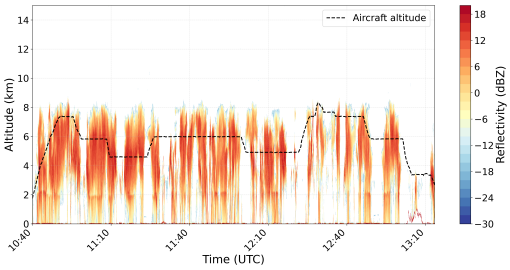
02/10/2018 08:58 → 14:28

Convection type:

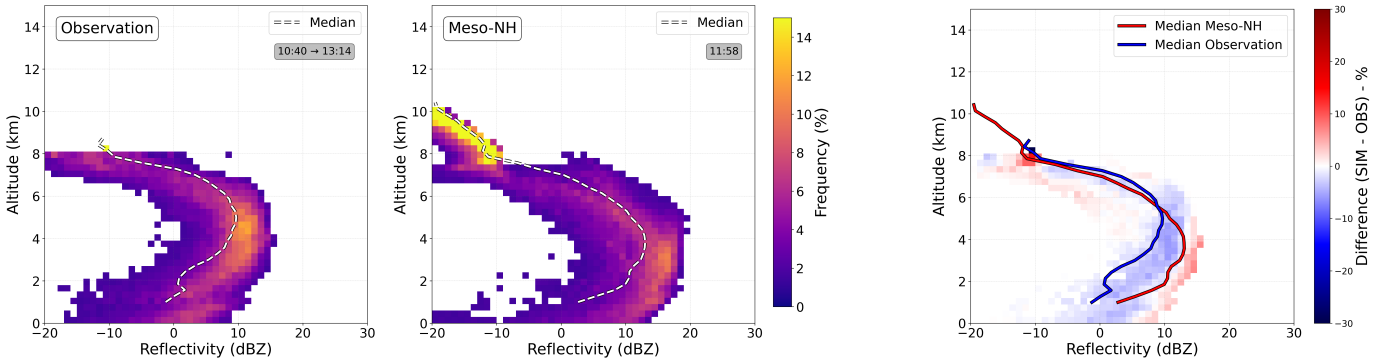
Mesoscale Convective System

1. KEY INDICATORS

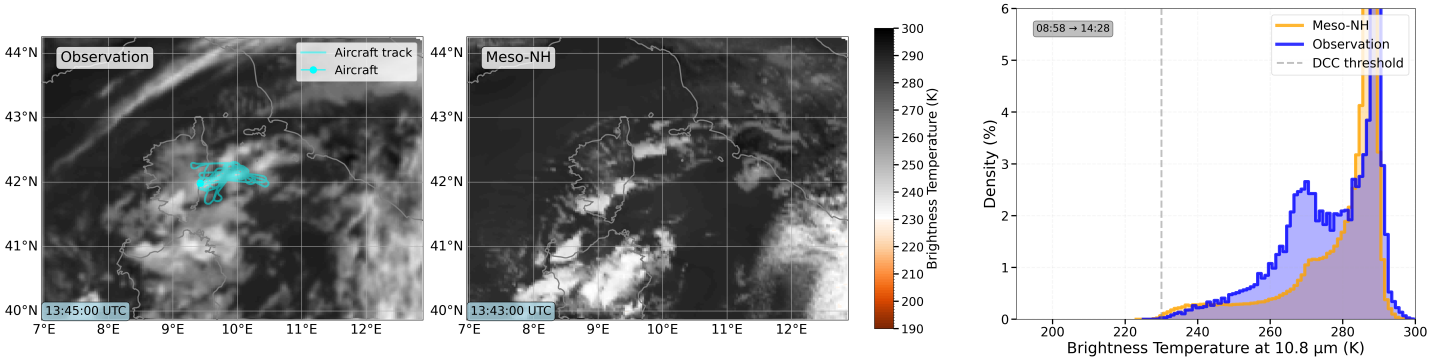
W max	**22.7 m/s**	IWP cover	**27.9%**	MTR bias	**-1.4 dBZ**
dIWP/dt max	**2.25e-01 kg/m²/s**	IWP max	**29.1 kg/m²**	BT bias	**3.5 K**
# convec. columns	**7335**	DCC cover	**0.1%**	DCC bias	**0.1%**
# growing columns	**2903**	Icy cover	**1.4%**	Icy bias	**-4.0%**



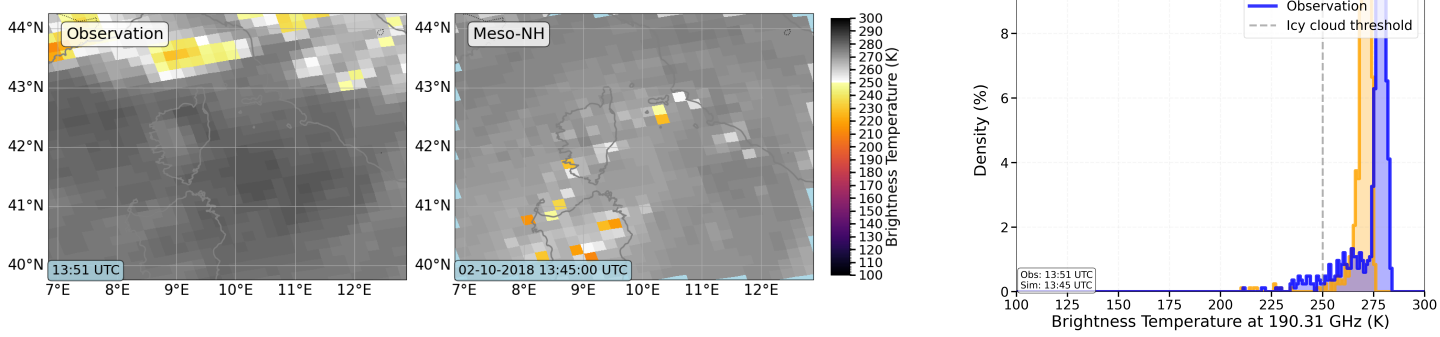
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



EXAEDRE - F21

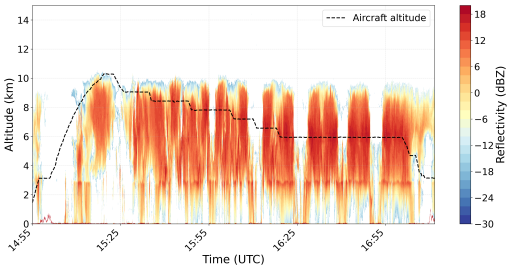
05/10/2018 12:28 → 17:58

Convection type:

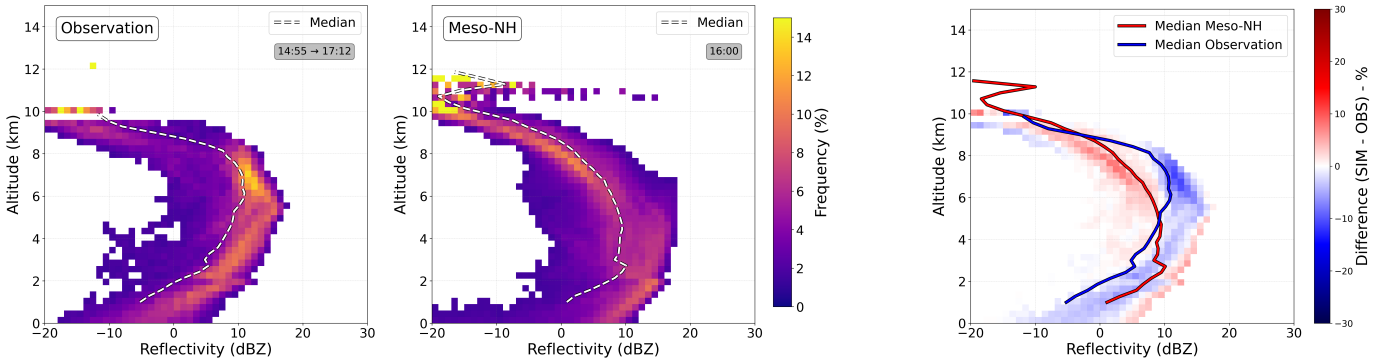
Mesoscale Convective System

1. KEY INDICATORS

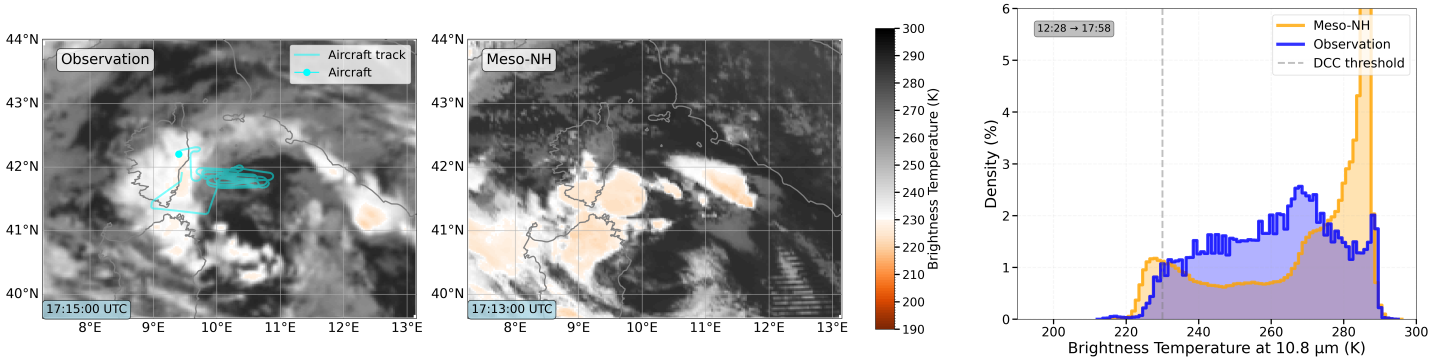
W max	**36.1 m/s**	IWP cover	**27.2%**	MTR bias	**-2.4 dBZ**
dIWP/dt max	**3.05e-01 kg/m²/s**	IWP max	**38.7 kg/m²**	BT bias	**5.7 K**
# convec. columns	**21551**	DCC cover	**7.6%**	DCC bias	**4.9%**
# growing columns	**5950**	Icy cover	**5.5%**	Icy bias	**-0.7%**



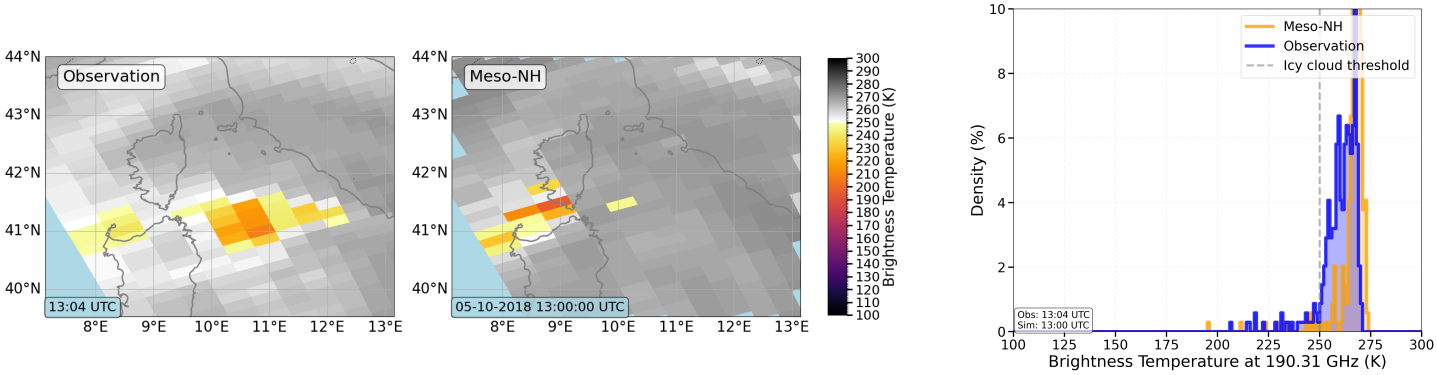
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



EXAEDRE - F22

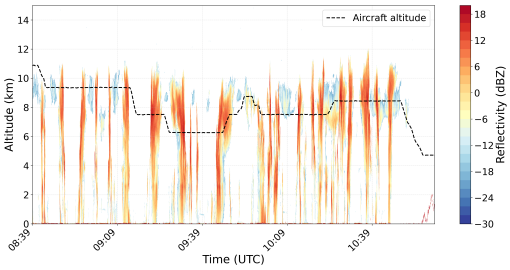
08/10/2018 06:58 → 12:28

Convection type:

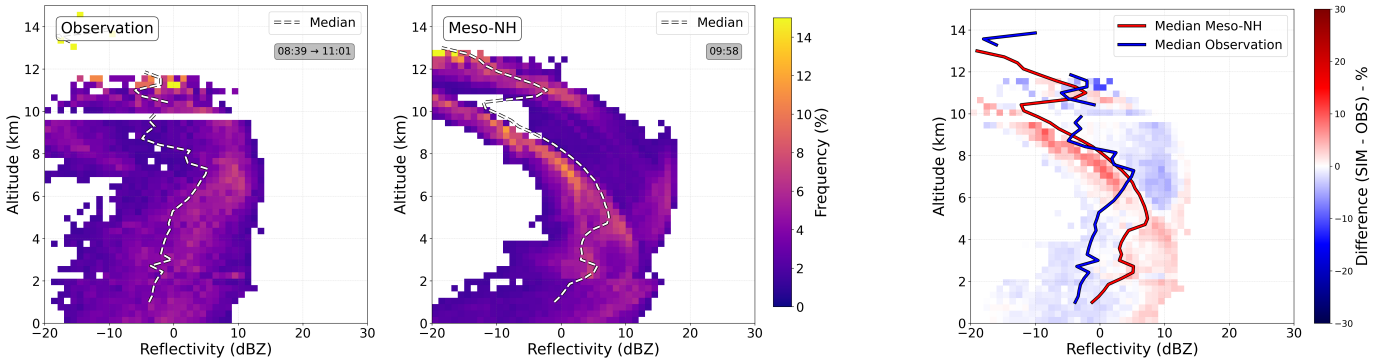
Mesoscale Convective System

1. KEY INDICATORS

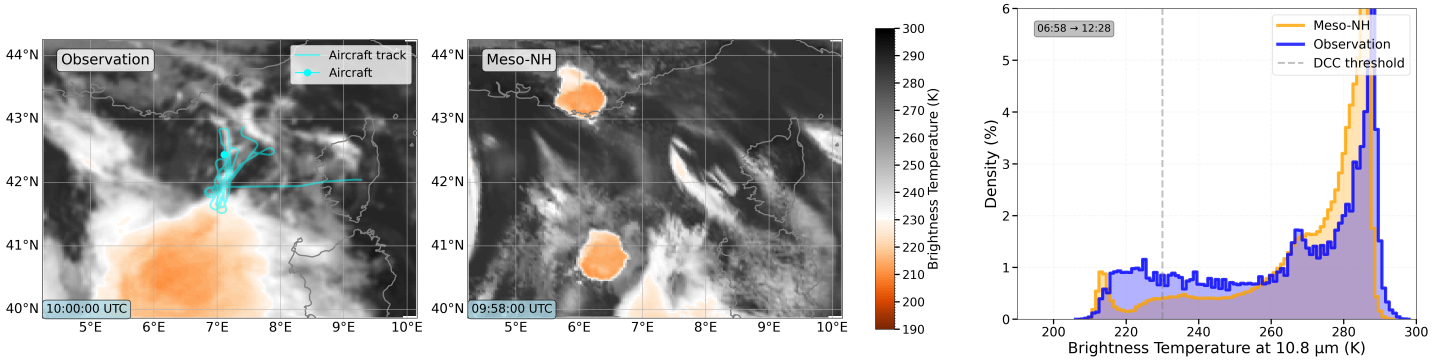
W max	**50.3 m/s**	IWP cover	**23.3%**	MTR bias	**0.8 dBZ**
dIWP/dt max	**2.44e-01 kg/m²/s**	IWP max	**51.9 kg/m²**	BT bias	**7.7 K**
# convec. columns	**20965**	DCC cover	**7.4%**	DCC bias	**-8.3%**
# growing columns	**5821**	Icy cover	**3.5%**	Icy bias	**-7.3%**



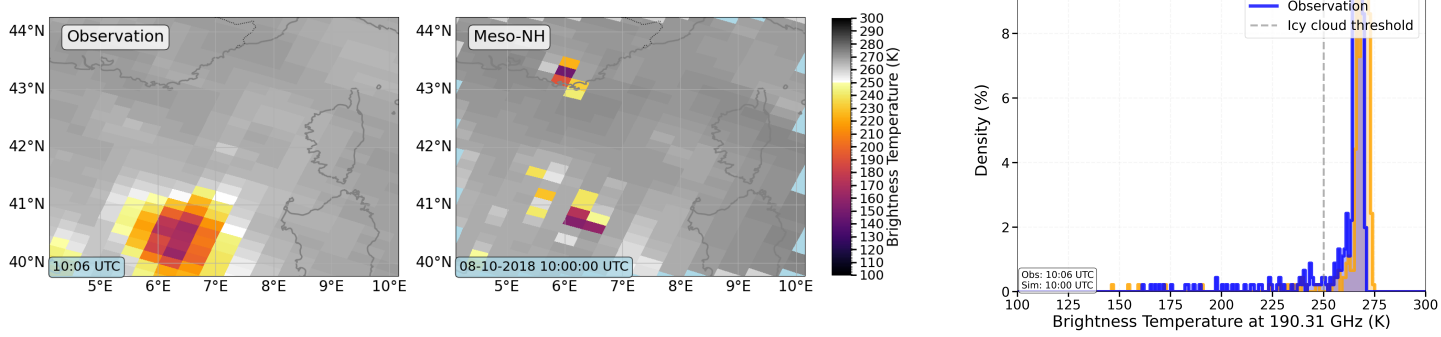
2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz



MAESTRO - F45

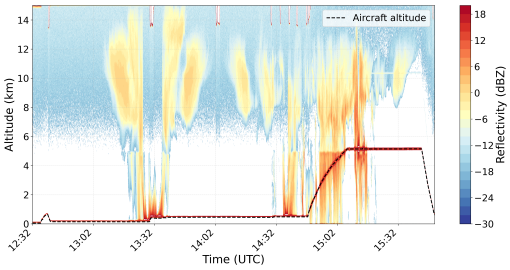
10/09/2024 12:28 → 17:58

Convection type:

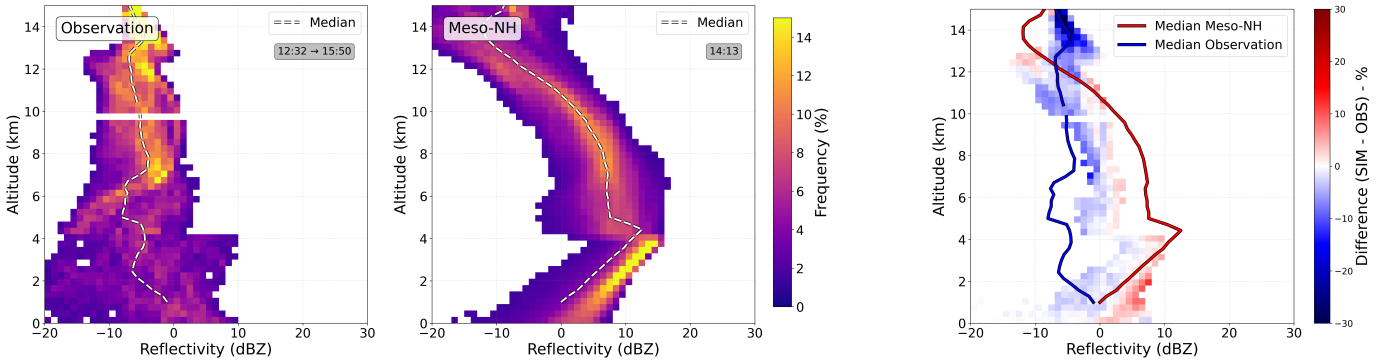
Mesoscale Convective System

1. KEY INDICATORS

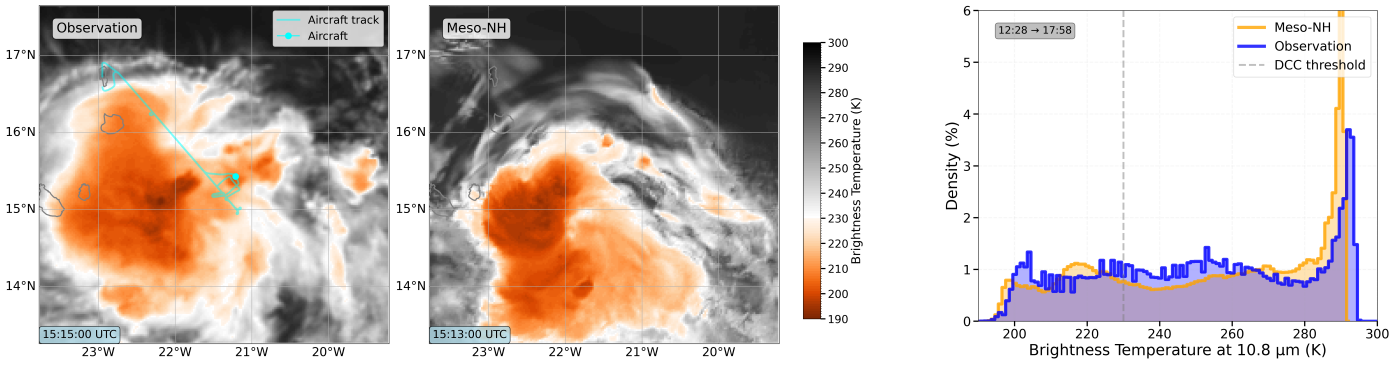
W max	**37.7 m/s**	IWP cover	**41.6%**	MTR bias	**12.1 dBZ**
dIWP/dt max	**2.40e-01 kg/m²/s**	IWP max	**49.0 kg/m²**	BT bias	**5.3 K**
# convec. columns	**30172**	DCC cover	**28.2%**	DCC bias	**-3.2%**
# growing columns	**6771**	Icy cover	**0.0%**	Icy bias	**0.0%**



2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz

No MHS 190 GHz comparison available

MAESTRO - F46

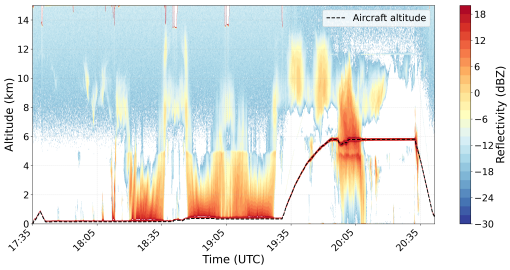
10/09/2024 18:13 → 23:43

Convection type:

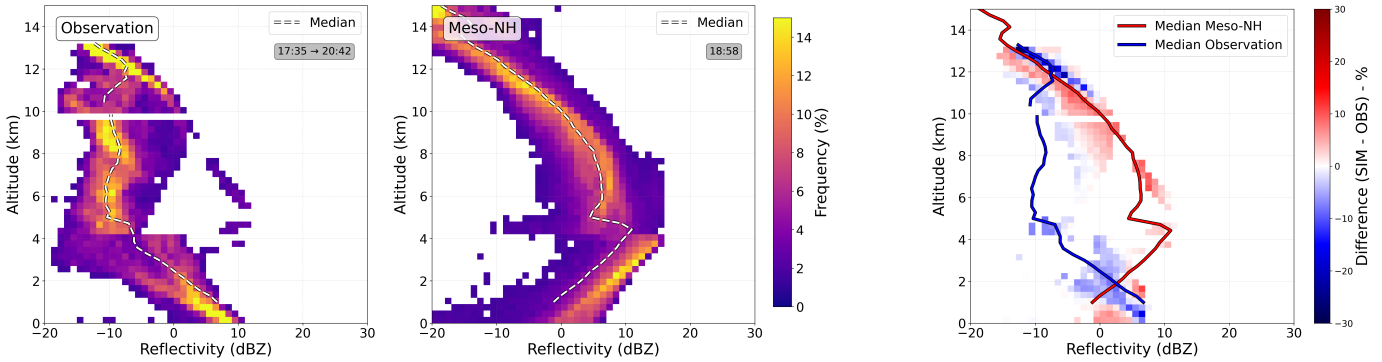
Mesoscale Convective System

1. KEY INDICATORS

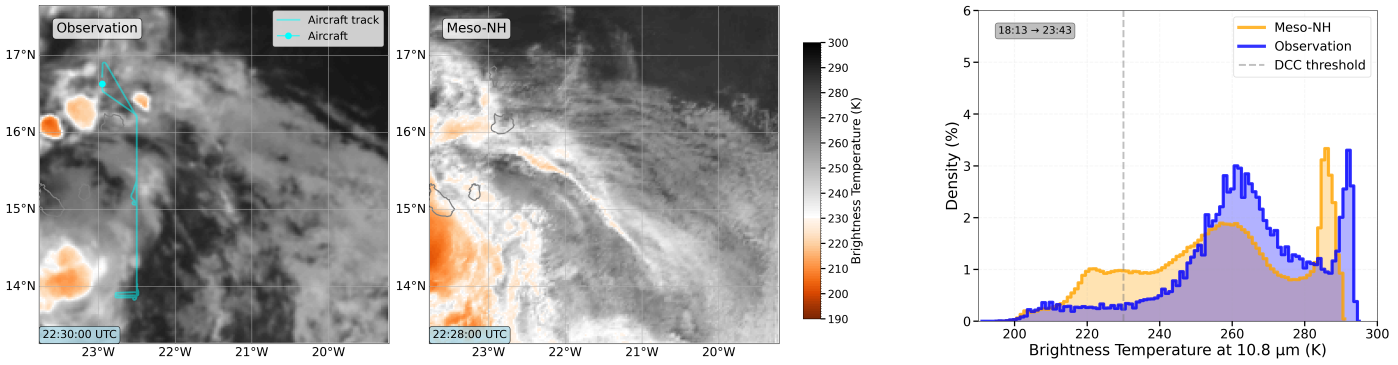
W max	**29.5 m/s**	IWP cover	**19.5%**	MTR bias	**14.2 dBZ**
dIWP/dt max	**1.85e-01 kg/m²/s**	IWP max	**38.5 kg/m²**	BT bias	**-8.3 K**
# convec. columns	**10559**	DCC cover	**16.5%**	DCC bias	**9.9%**
# growing columns	**2471**	Icy cover	**28.6%**	Icy bias	**0.0%**



2. RADAR REFLECTIVITY - 95 GHz (RASTA)



3. INFRARED - 10.8 µm



4. MHS - 190.31 GHz

