The analysis of typhoon parameters by using AMSU data

DATA

METHOD

RESULTS

CONCLUSION

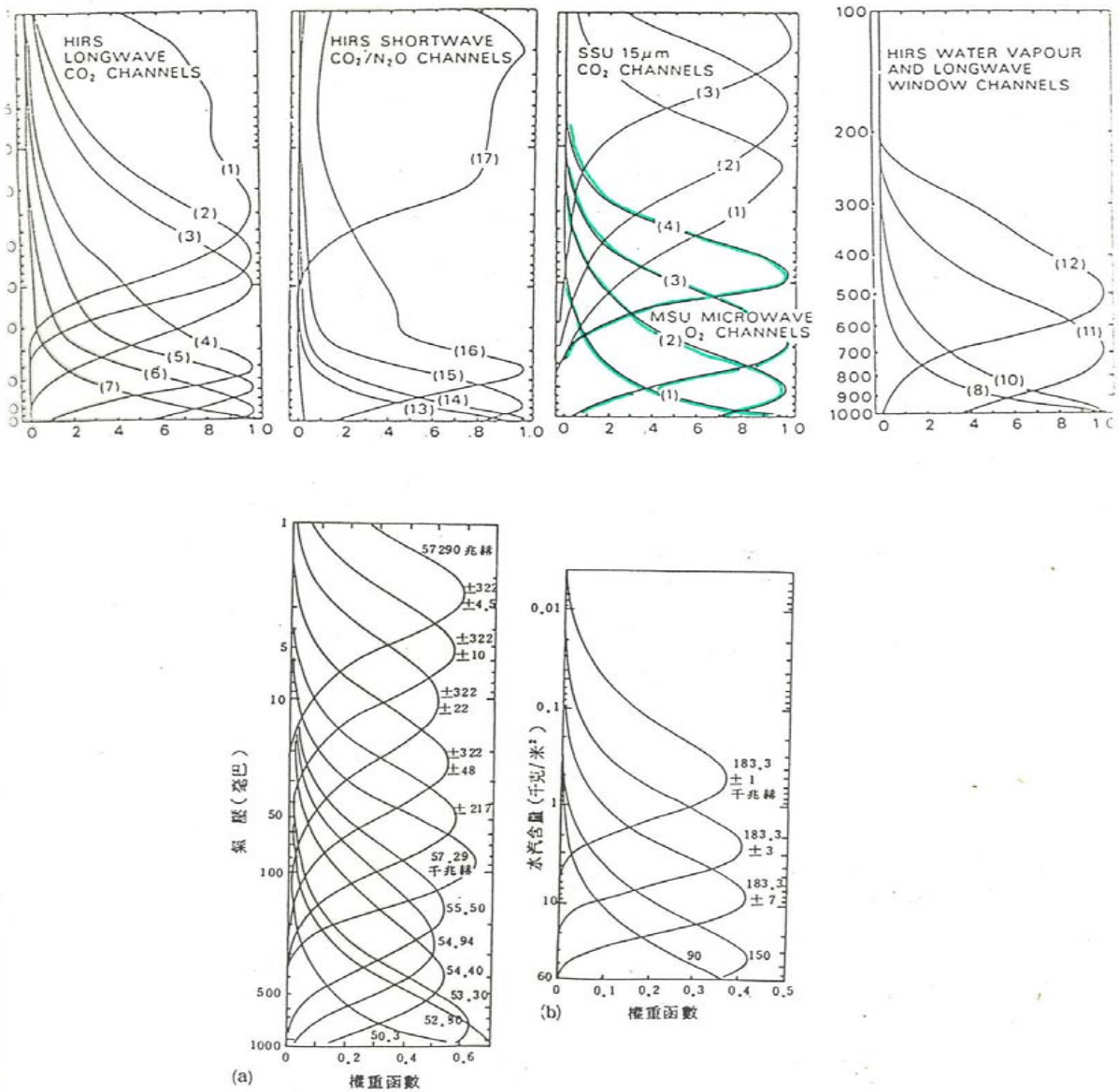
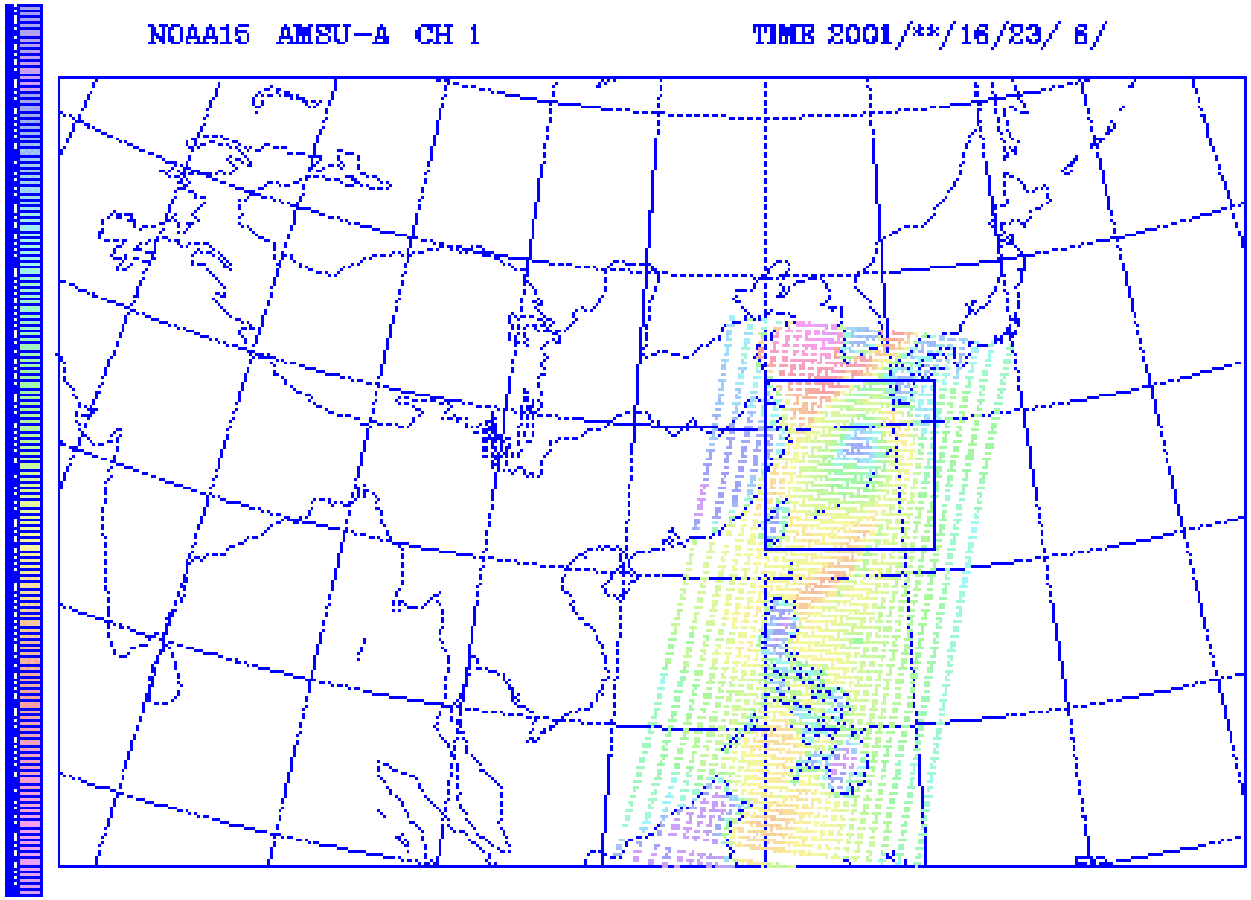


圖 13-18　(a)AMSU-A 的氣溫權重函數。(b)AMSU-B 的水汽權重函數。


NOAA15 AMSU-A CH 1
TIME 2001/**/16/23/ 6/

$$T(p) = C_o(p,\theta_s) + \sum_{i=1}^{n} C_i(p,\theta_s) T_b(\nu_i,\theta_s)$$

$$f\nabla^2\psi + 2(\psi_{xx}\psi_{yy} - \psi^2{}_{xy}) + \psi_x f_x + \psi_y f_y = \nabla^2\phi$$

$$\frac{1}{2}(\psi_{xx}+\psi_{yy}+f)^2 - \frac{1}{2}(\psi_{xx}+\psi_{yy})^2 - 2\psi^2_{xy} + (\psi_x f_x + \psi_y f_y) - (\Phi_{xx}+\Phi_{yy}+\frac{1}{2}f^2) = 0$$

V = k ¡ Ñ¾

$$\nabla^2(\sigma\omega) + f\xi_a \frac{\partial^2 \omega}{\partial p^2} = f \frac{\partial}{\partial p}(V_\psi + V_x) \cdot \nabla \xi$$
$$+ \frac{R}{P}(\nabla^2 V_\psi + \nabla^2 V_x) \cdot \nabla T$$
$$- f \frac{\partial}{\partial p}(\xi \nabla^2 x) + f \frac{\partial}{\partial p}(\omega \frac{\partial \xi}{\partial p})$$
$$+ f \frac{\partial}{\partial p}(\nabla \omega \cdot \nabla \frac{\partial \psi}{\partial p})$$
$$- \frac{R}{C_p P} \nabla^2 Q + fg \frac{\partial^2}{\partial p^2} \nabla \times \tau$$

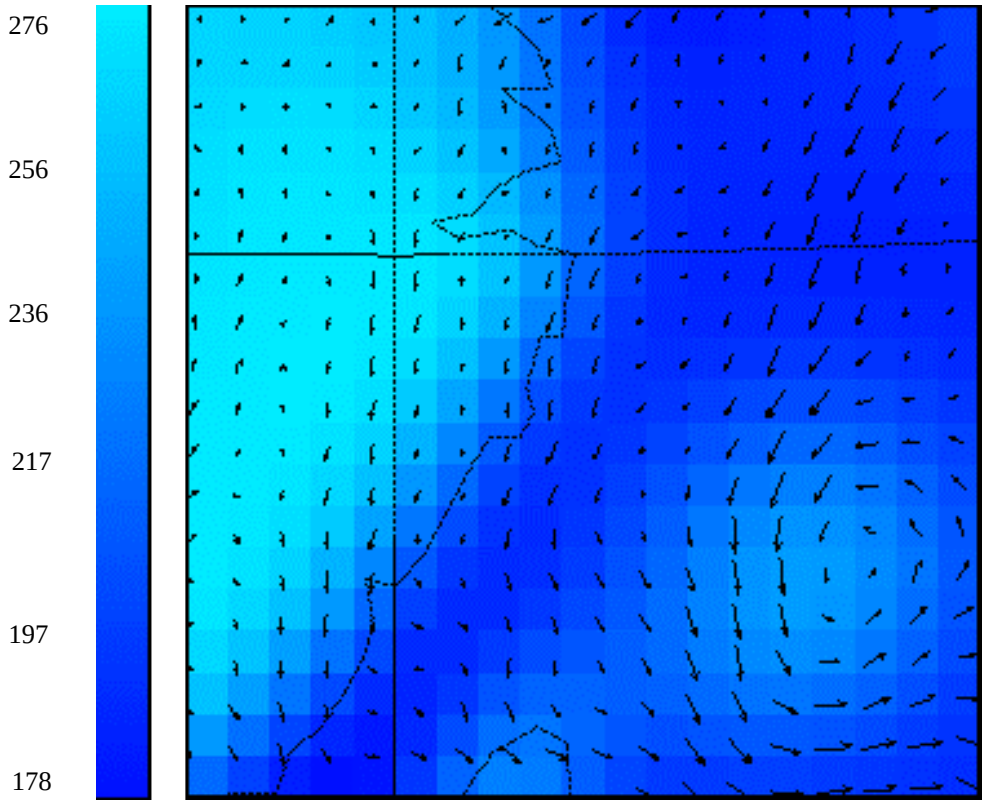
$$\nabla^2 x + \frac{\partial \omega}{\partial p} = 0$$

$$CLW = \cos\theta\{D_0 + D_1 \ln[T_s - T_B(\nu_1)] + D_2 \ln[T_s - T_B(\nu_2)]\}$$

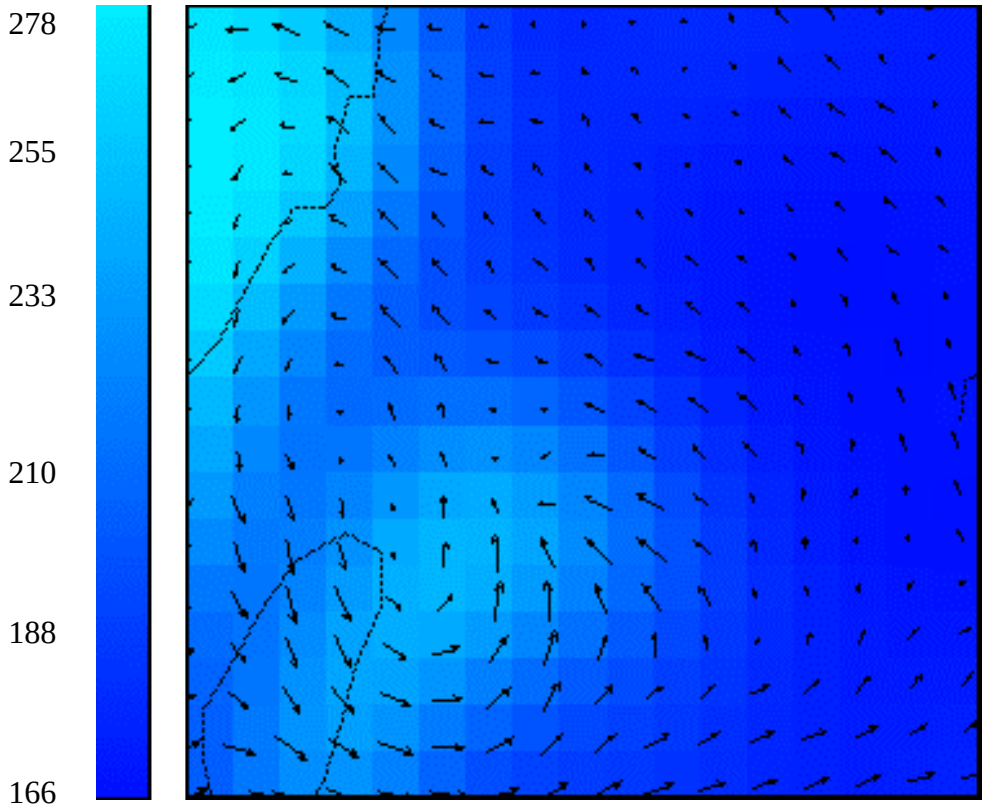
$$R = 0.002(100CLW)^{1.7}$$

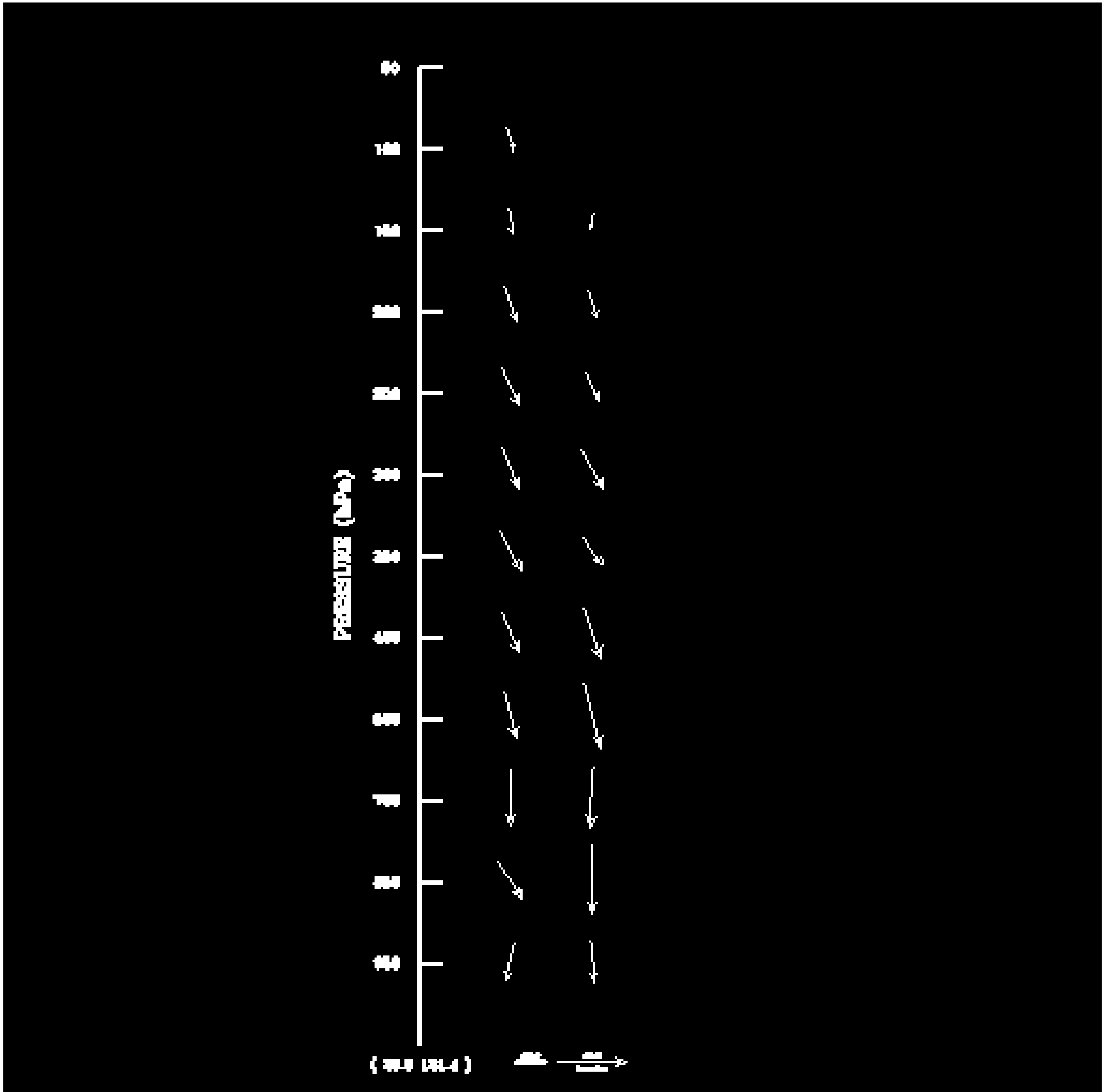
£ ñC_{D}¡ ý**b**¡ ý**b**

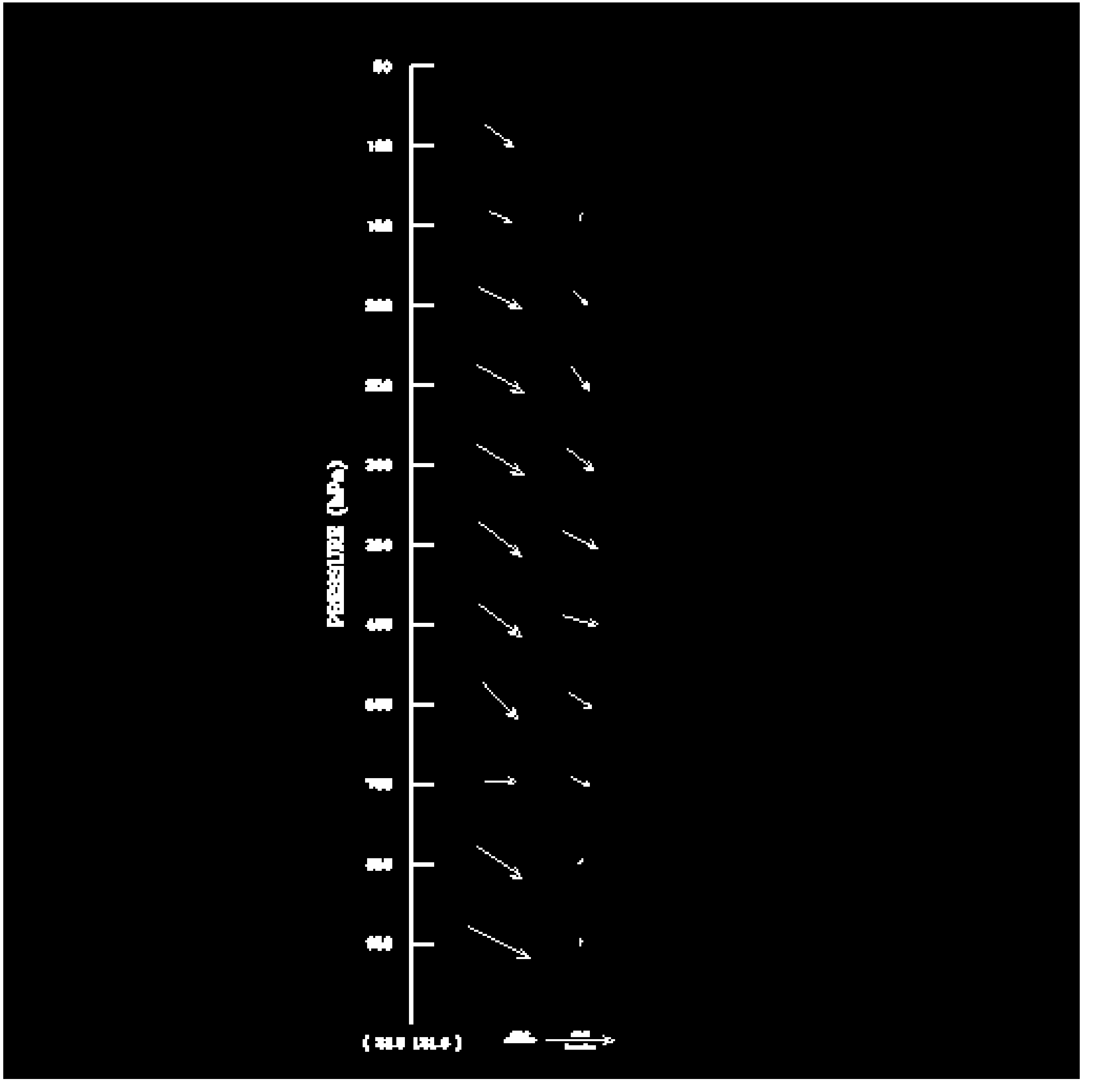
Time 2001 / 09 / 14 / 23 / 34 AMSU channel 2



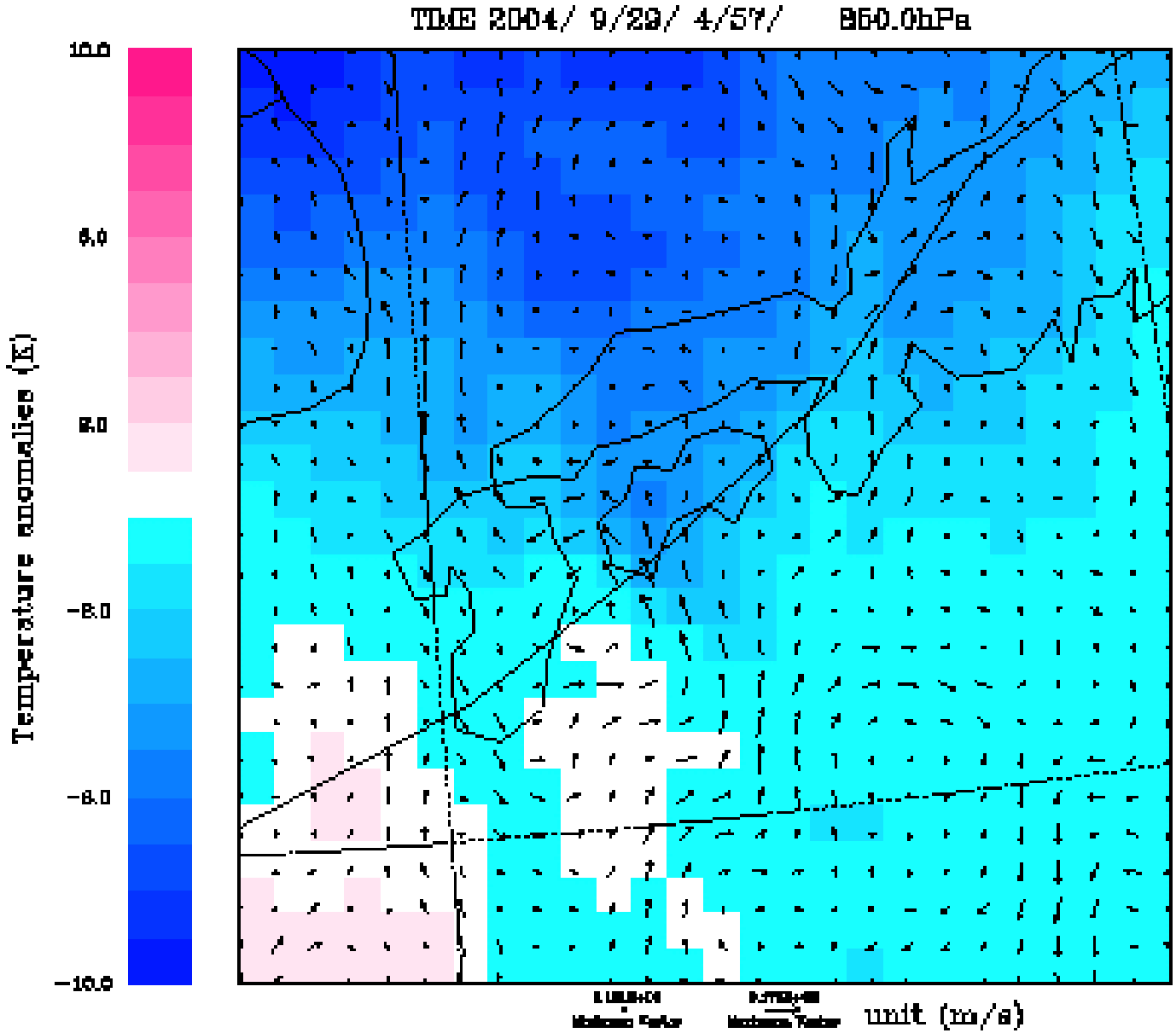
Time : 2001/ 09 / 16 / 10 / 24 500hPa

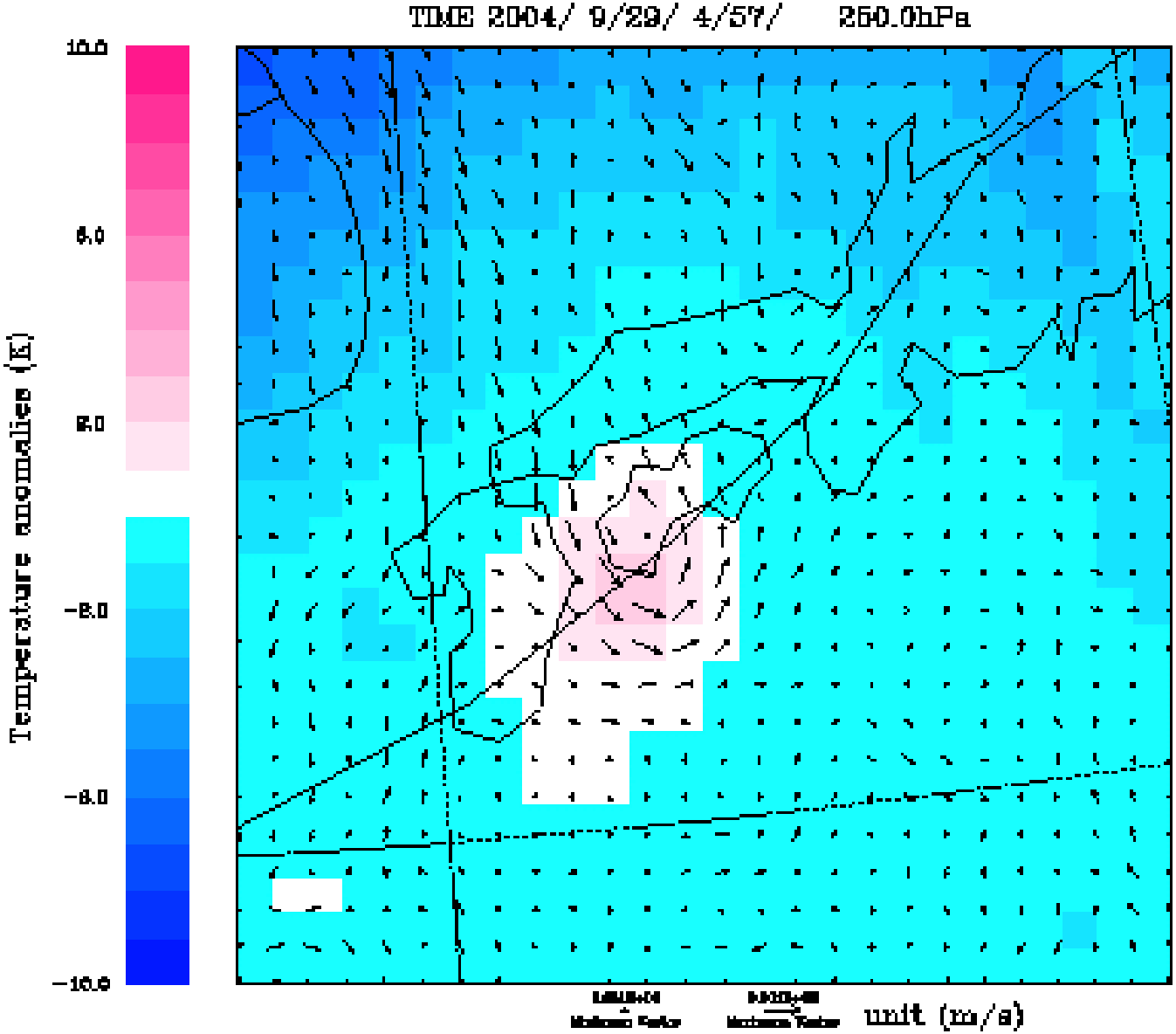


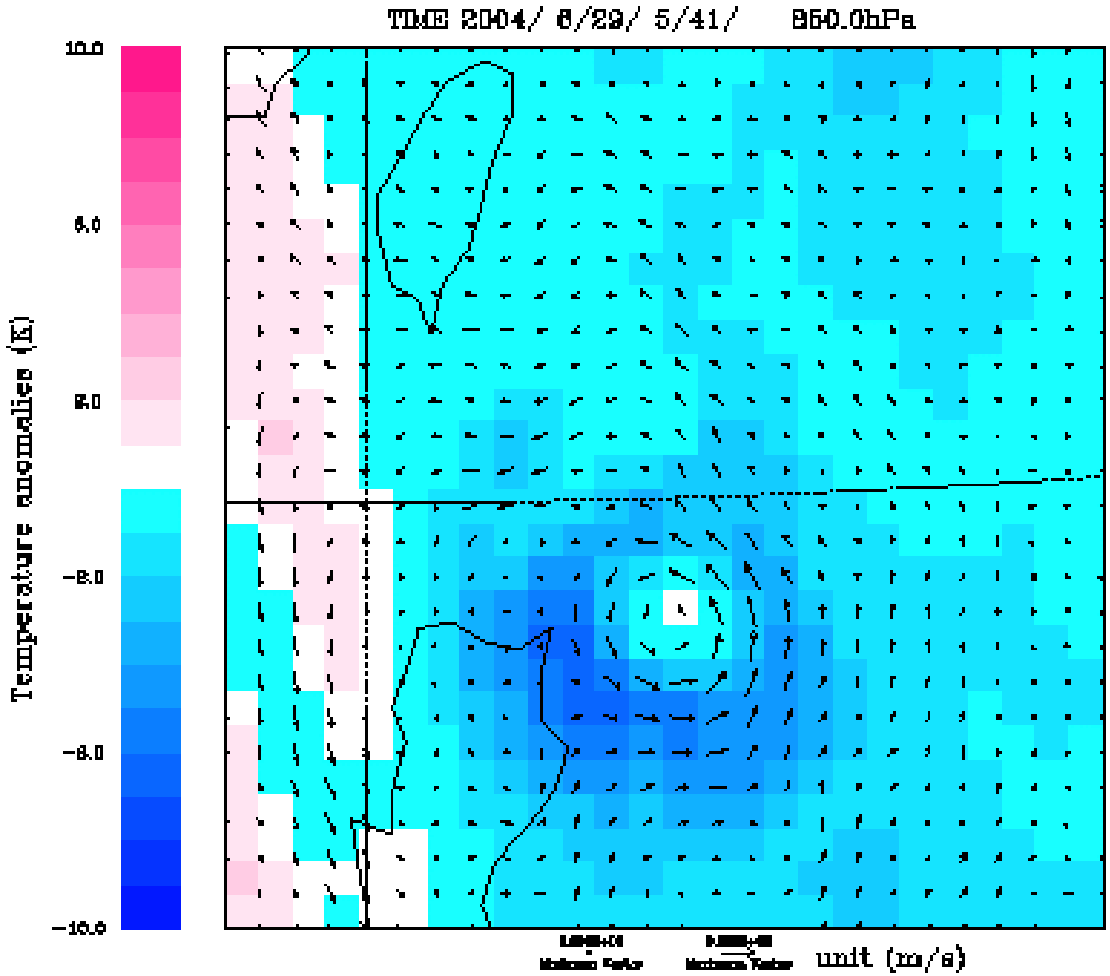

PRESSURE (hPa)

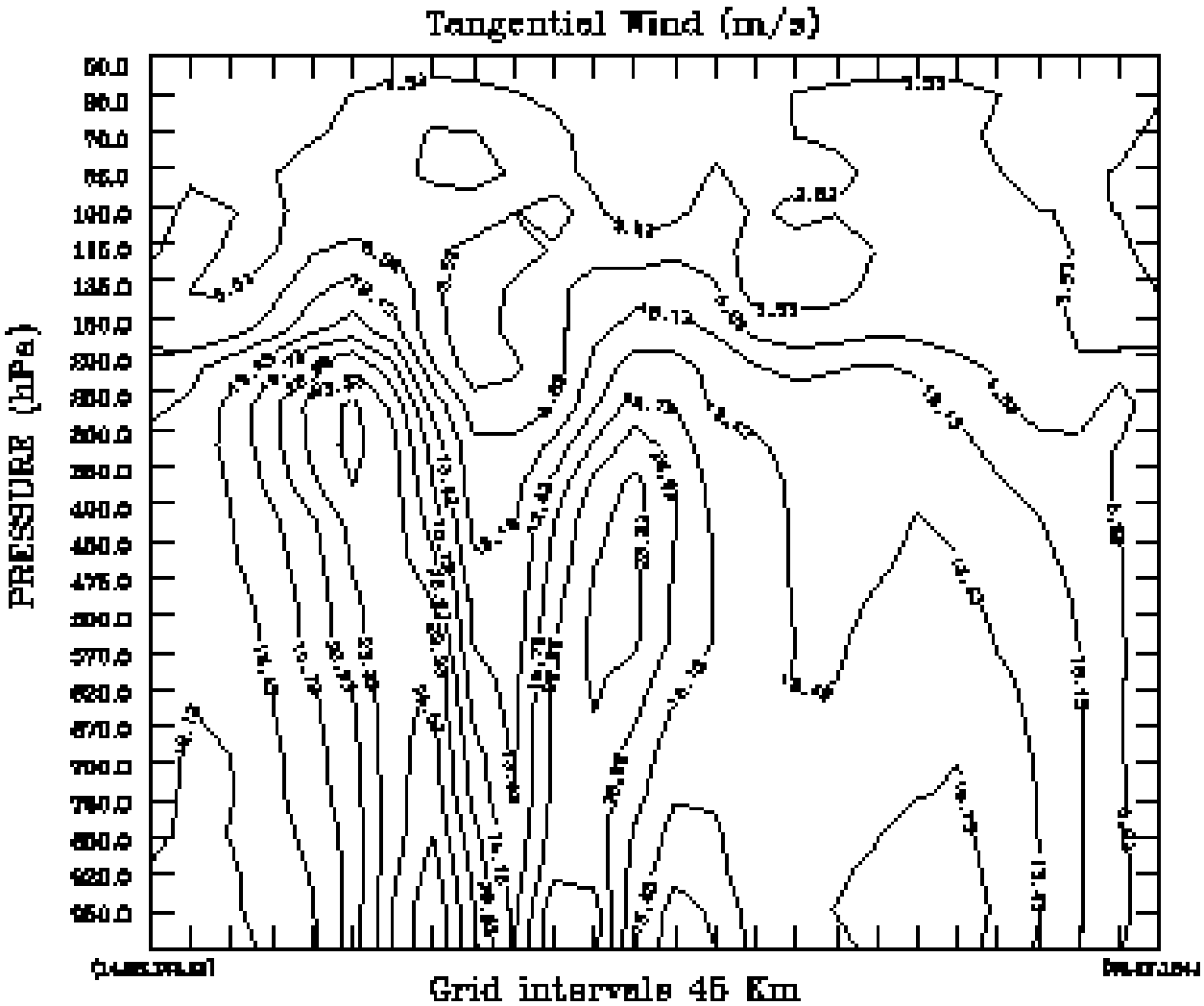


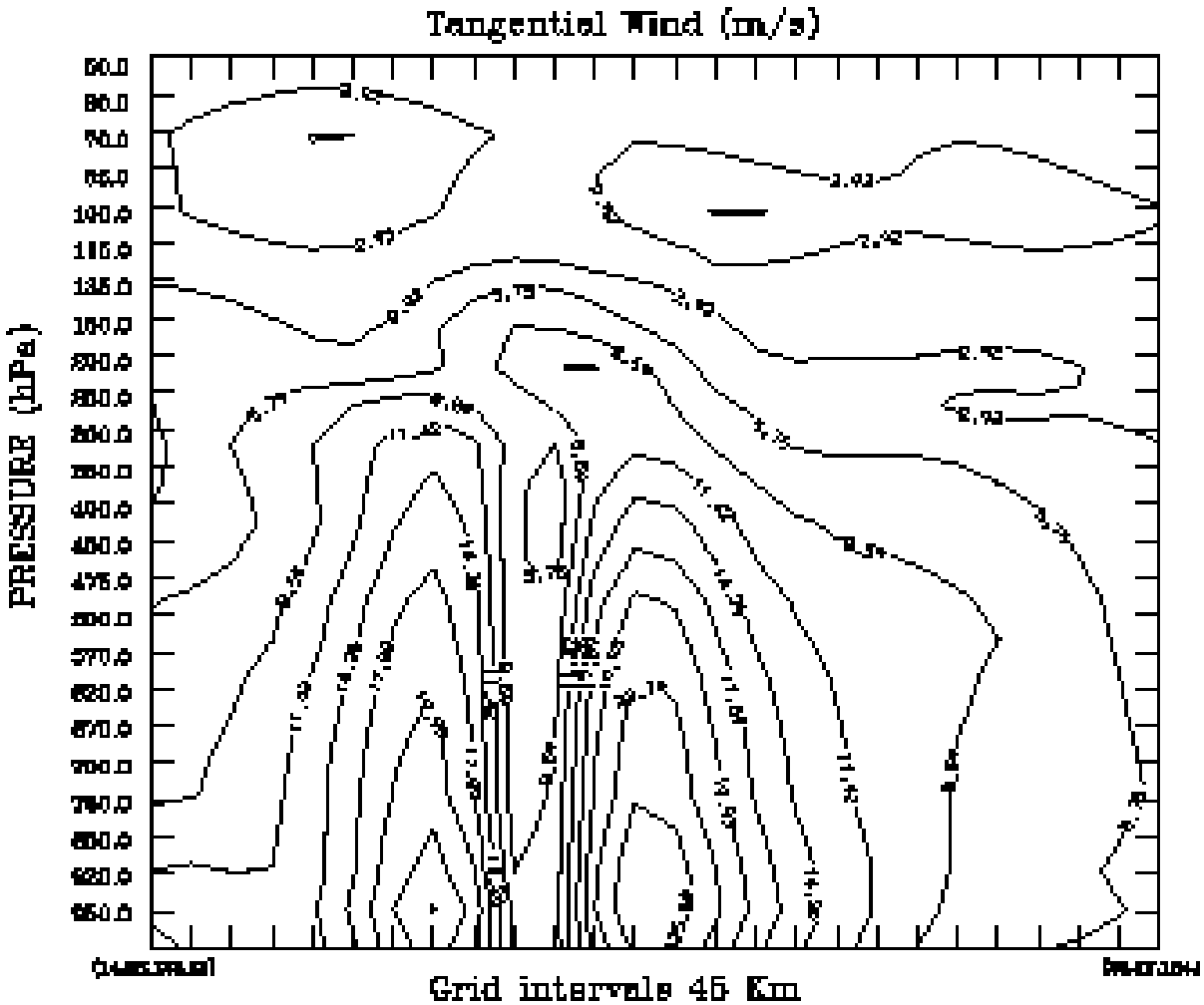
PRESSURE (hPa)

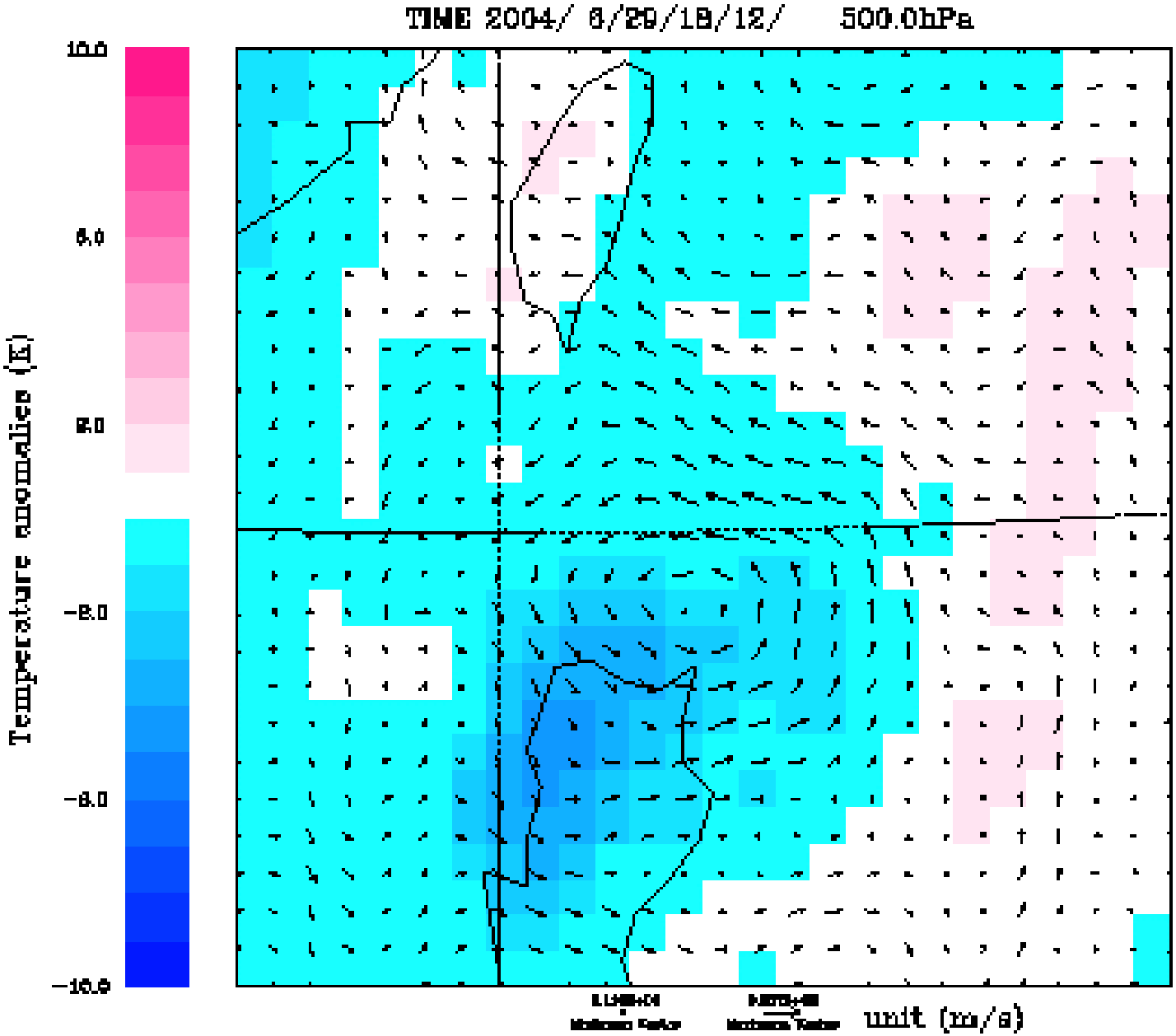

TIME 2004/ 9/29/ 4/57/ 850.0hPa
10.0
6.0
2.0
-2.0
-6.0
-10.0
Temperature anomalies (K)
unit (m/s)

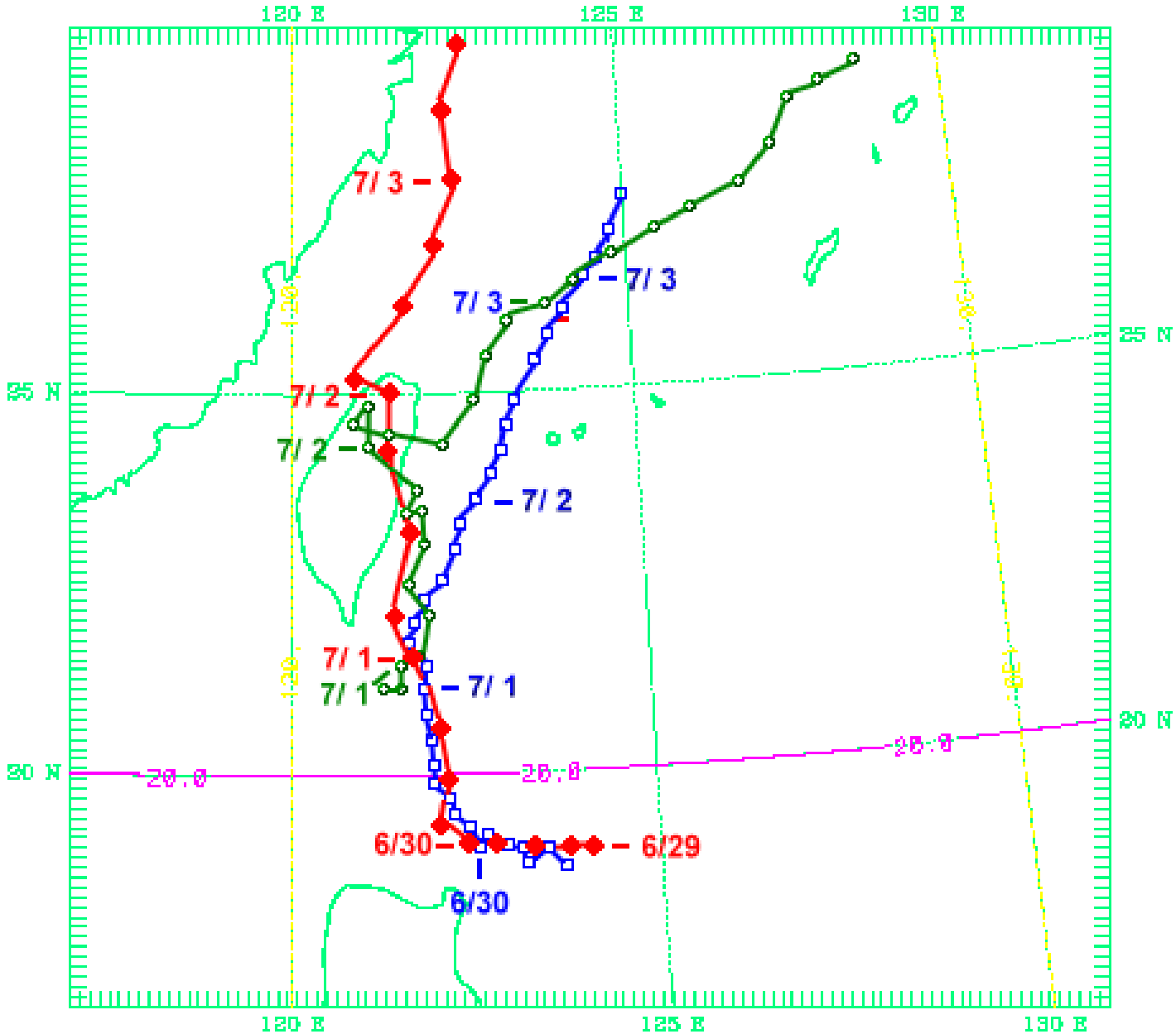

TIME 2004/ 9/29/ 4/57/ 250.0hPa
10.0
6.0
2.0
-2.0
-6.0
-10.0
Temperature anomalies (K)
unit (m/s)

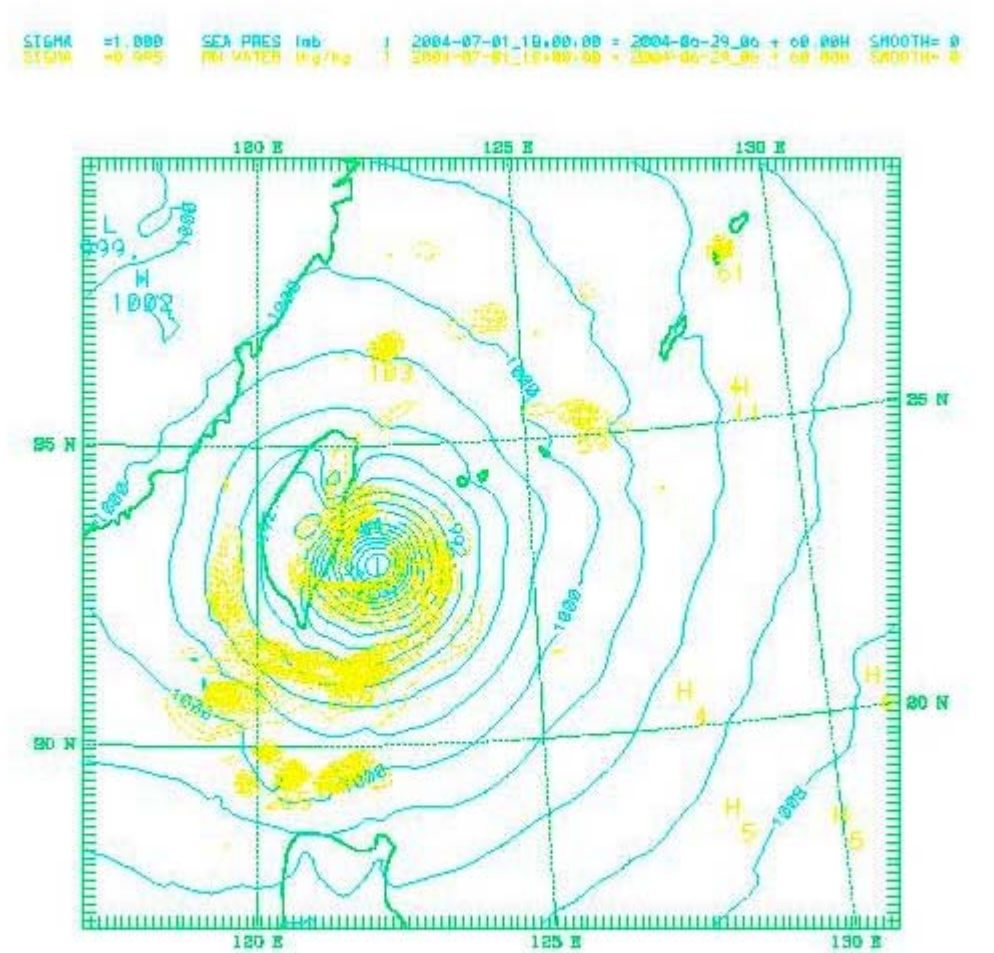

TIME 2004/ 6/29/ 5/41/ 850.0hPa
10.0
6.0
2.0
-2.0
-6.0
-10.0
Temperature anomalies (K)
unit (m/s)


Tangential Wind (m/s)
PRESSURE (hPa)
Grid interval: 45 Km
TIME 2004/ 6/29/ 5/41/

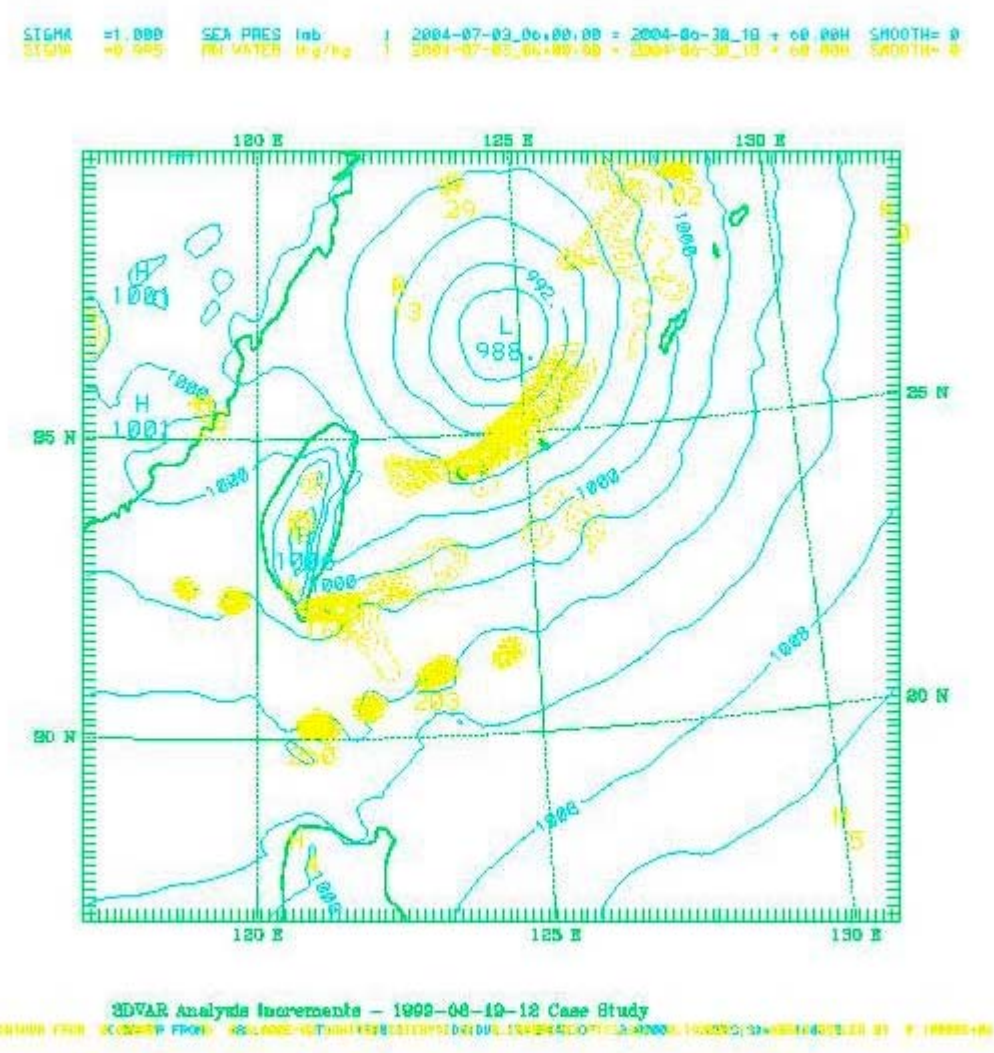

Tangential Wind (m/s)
PRESSURE (hPa)
Grid interval: 45 Km
TIME 2004/ 6/29/ 5/41/


TIME 2004/ 6/29/18/12/ 500.0hPa
10.0
6.0
2.0
-2.0
-6.0
-10.0
Temperature anomalies (K)
unit (m/s)


120 E
125 E
130 E
25 N
20 N
7/ 3
7/ 3
7/ 3
7/ 2
7/ 2
7/ 2
7/ 1
7/ 1
7/ 1
6/30
6/29
6/30



3DVAR Analysis Increments – 1999-08-19-12 Case Study



3DVAR Analysis Increments – 1999-08-19-12 Case Study

Conclusion and future work

- Three dimensional Typhoon temperature and wind fields can be estimated by AMSU data. And typhoon various structure at different environments could be depicted.
- The typhoon fields driven from AMSU could provide an initial condition for NWP forecast.
- In estimating process assumed 50 hPa height is constant and integrated from top to lower levels to calculate height at each levels seem reasonable.
- *More case test*
- *More accurate temperature estimate (data or technique)*

International TOVS Study Conference, 14th, ITSC-14, Beijing, China, 25-31 May 2005. Madison, WI, University of Wisconsin-Madison, Space Science and Engineering Center, Cooperative Institute for Meteorological Satellite Studies, 2005.