

Status of tropical storm operation forecasting process and Some results indicate the intensity of typhoon in Vietnam when it near scan radius 120 km of radar

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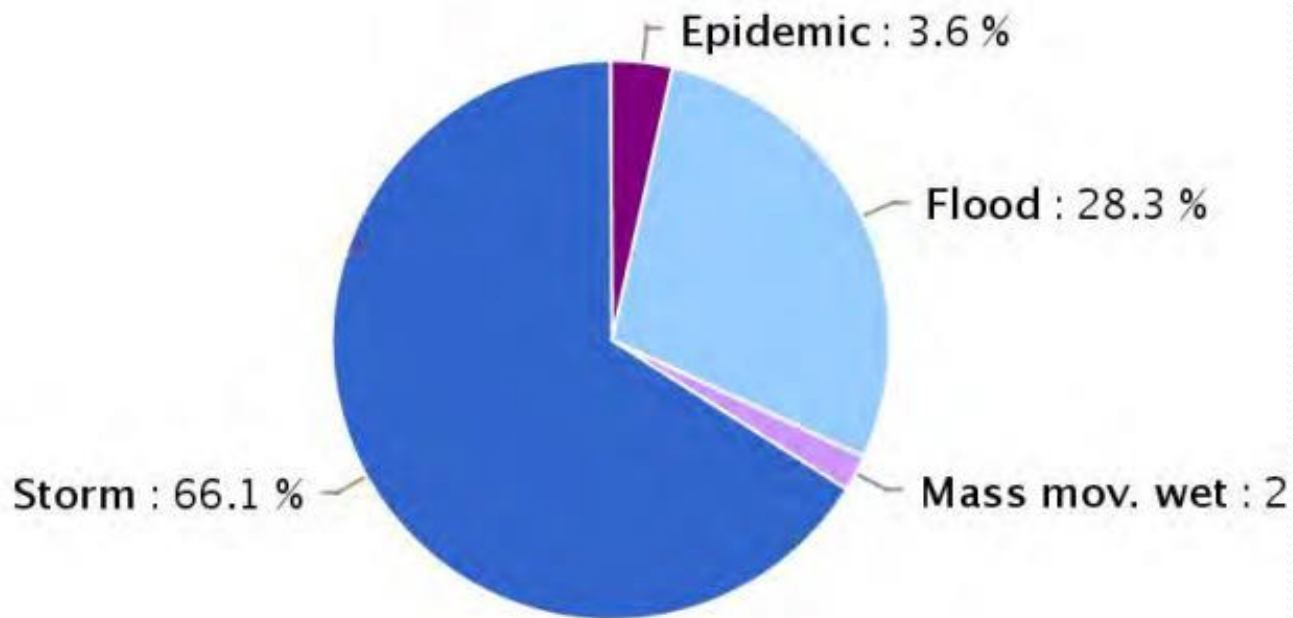
The Major Natural Disasters in Vietnam

1. Tropical Storm/ typhoon	8. River bank erosion
2. Flood	9. Flash Flood
3. Inundation	10. Landslide
4. Drought	11. Storm Surge
5. Salt water intrusion	12. Forest Fire
6. Whirlwind	13. Earthquake
7. Shoreline erosion	14. Tsunami

Profile for Damages of Natural Disasters from 1980-2010 of Vietnam

- No. of events: 159
- No. of people killed: 16,099
- Average killed per year: 519
- No. of people affected: 73,582,754
- Average affected per year: 2,373,637
- Source: <http://www.preventionweb.net/english/countries/statistics/?cid=190>

Percentage of people killed by disaster type



- **66.1 % people killed by tropical storm.**

Tropical storm forecasting bulletin

- Determine center location of typhoon
- Determine the intensity of typhoon
- Determine the radius of the strong wind
- Determine areas and intensity of rainfall

Increasing Tropical storm observation and another activities

- For the stations affected by typhoon, during typhoon time the observation of wind speed and direction, rain will be conducted and reported at least every hour.
- Sattellite: collecttion and analysic 5 minutes/obs
- NWP: GFS, GSM, HRM, ETA, ...
- Sounding: 2 obs/day -> 4 obs/day
- Radar: 24h/24h + 30 minutes/report + 10 minutes/obs
- Pilot: 1 obs/day -> 2 obs/day
- Report: 30 minutes/report location of storm and rainfall
- Conference, online serminas, broadcast news on the radio, media, ...

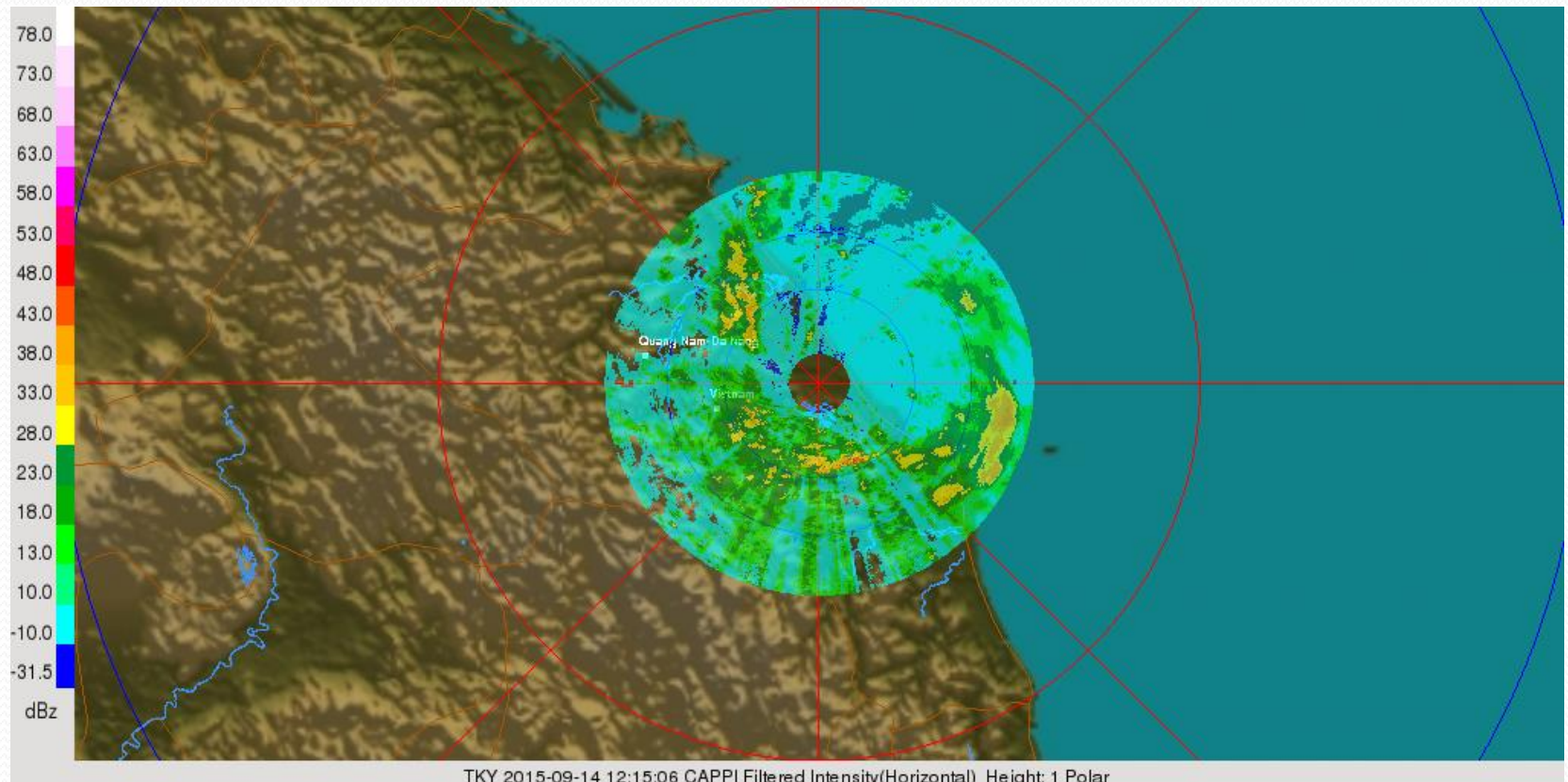
Some of result about experiment to determine typhoon intensity of Durian (2006) and Vamco (2015) using Doppler radar data

- Vamco (2015)



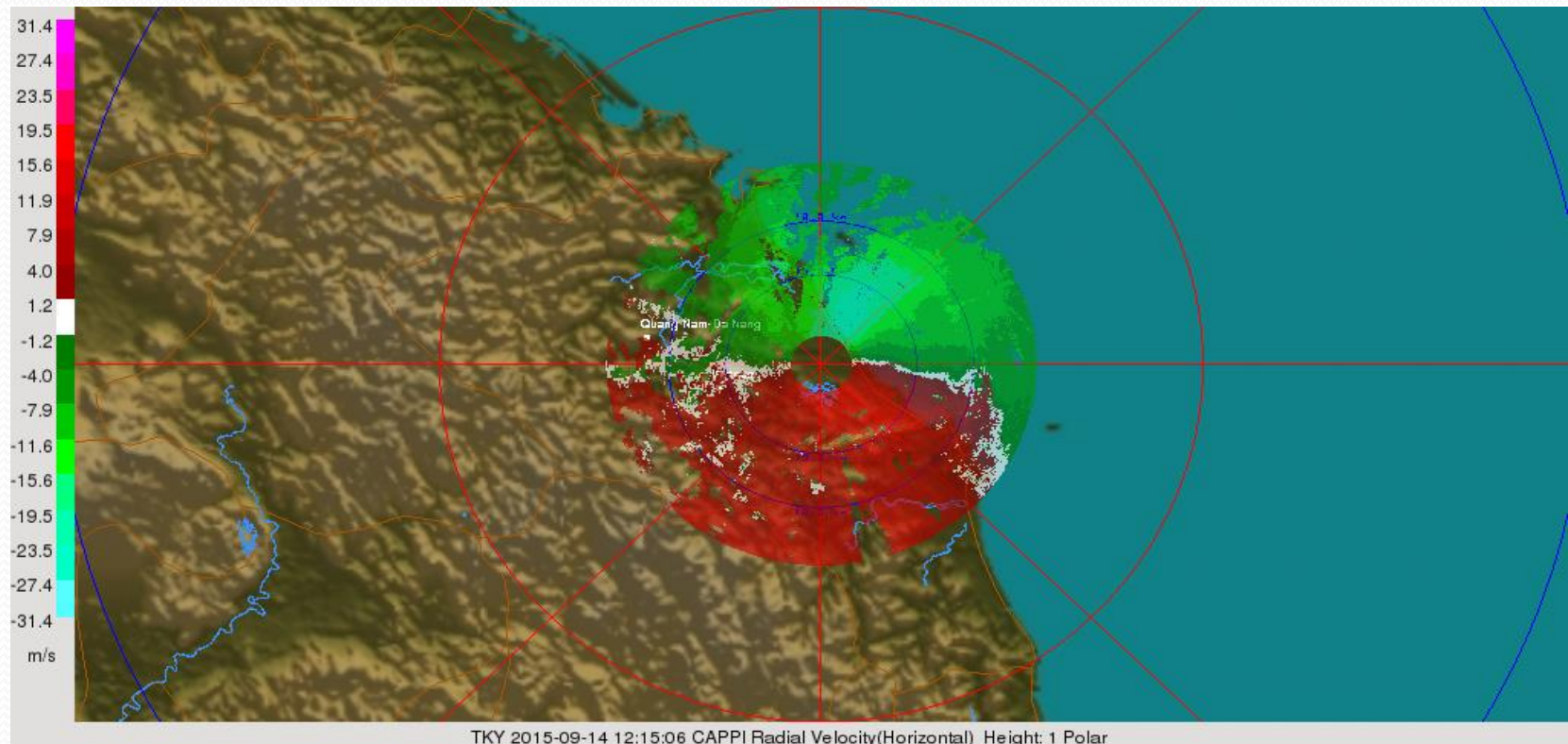
Wind and reflectivity field analysis using EDGE software product

At 12:15 GMT on September 14th, 2015, Vamco stormed into the mainland and weakened.



Reflectivity field at 12:15 GMT September 14th, 2015

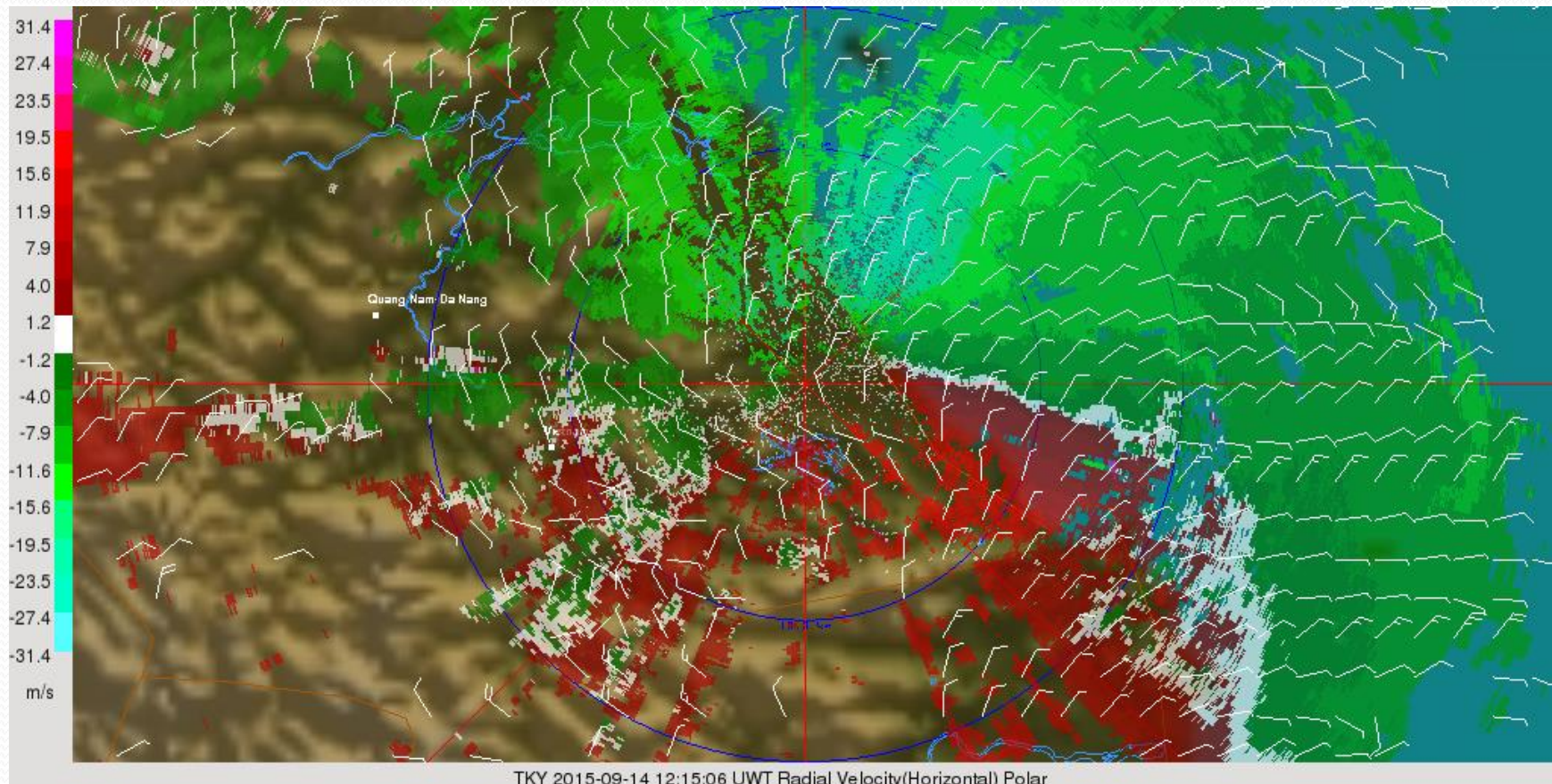
Wind and reflectivity field analysis using EDGE software products (cont.)



Doppler Wind Field at 12:15 GMT September 14th, 2015

Radial wind products are distributed relatively symmetrically through the zero line (white), the center of storm may be located somewhere on this line. However, the zero line here is not clear, so it is more difficult to determine the center of the storm as well as the wind speed in the storm

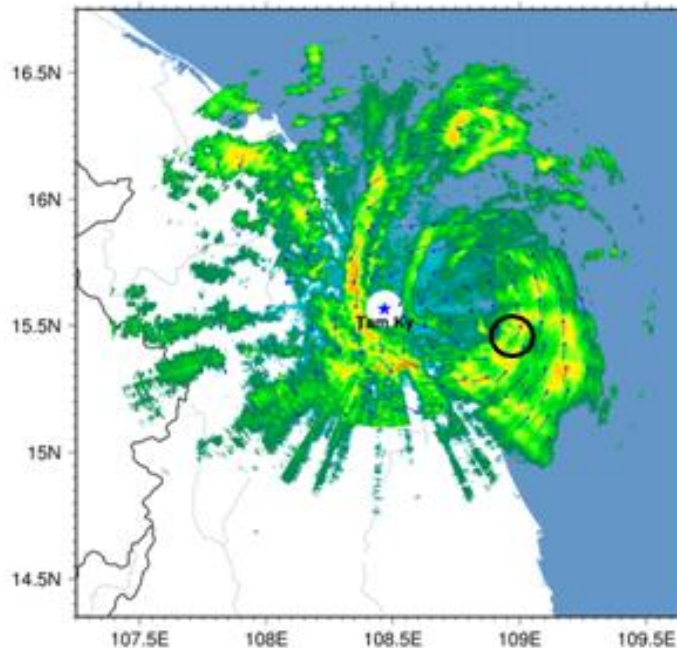
Wind and reflectivity field analysis using EDGE software products (cont.)



Horizontal Wind Field at 12:15 GMT September 14th, 2015

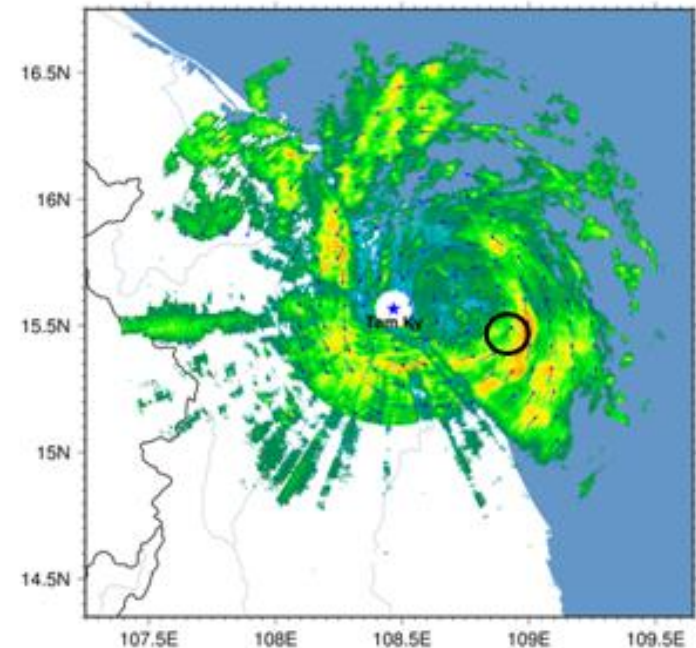
The wind field distribution shown in this product is quite confusing, difficult to recognize the trend, not yet the actual flow of the storm.

Analysis of reflectivity field characteristics when using products generated from software interpolate and display the horizontal wind from the radial wind



TK_20150914_1145_CAPPI_0010_120_Z

(a) Lúc 11:45 GMT ngày 14/9/2015

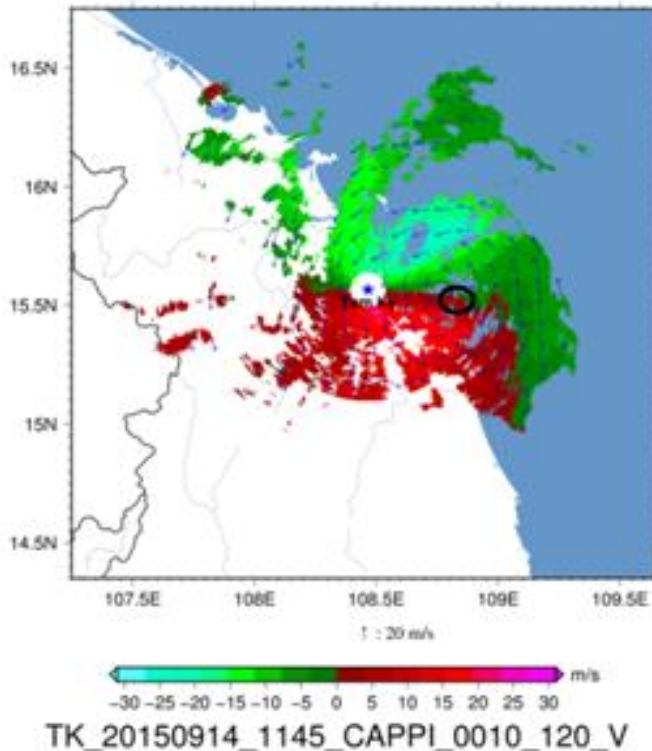


TK_20150914_1215_CAPPI_0010_120_Z

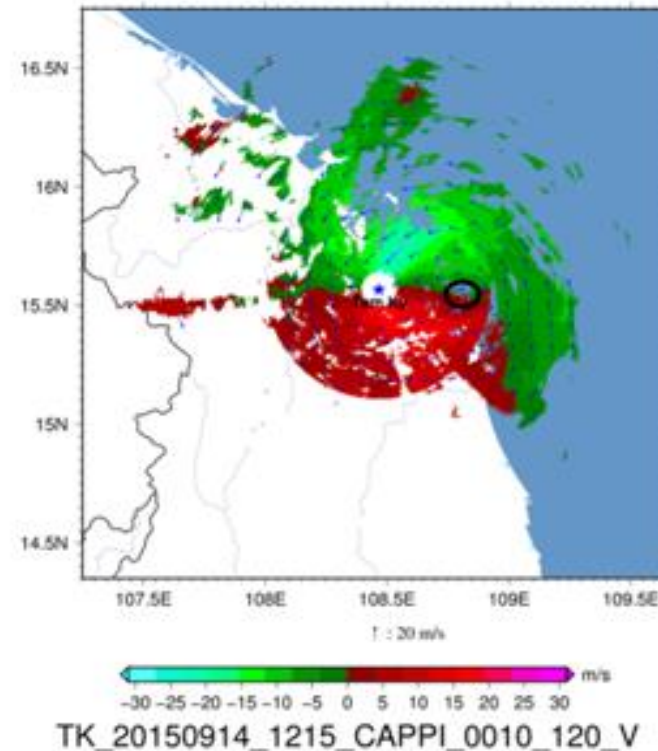
(b) Lúc 12:15 GMT ngày 14/9/2015

Hình 5.28. Tích hợp trường gió ngang và PHVT trên CAPPI 1km trạm Tam Kỳ

Analysis of reflectivity field characteristics when using products generated from software interpolate and display the horizontal wind from the radial wind



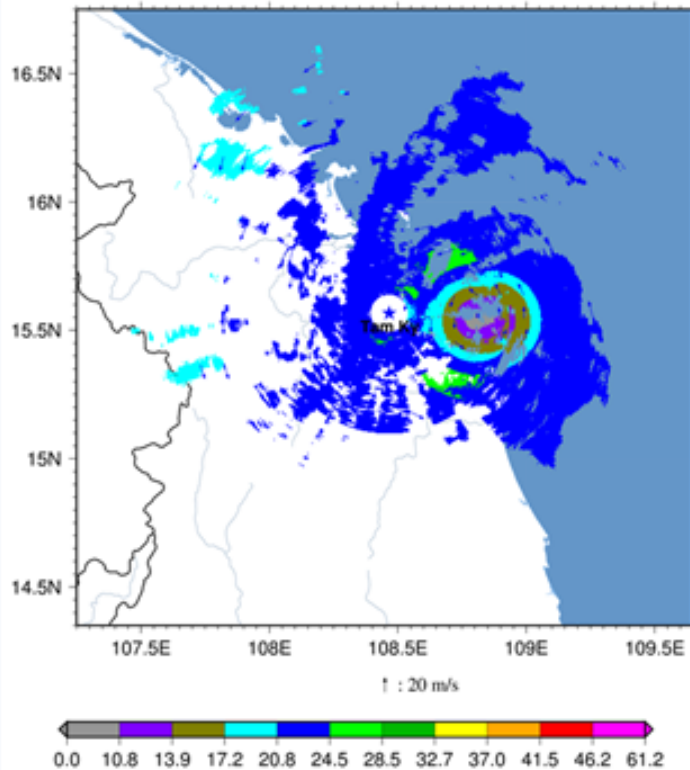
(a) Lúc 11:45 GMT ngày 14/9/2015



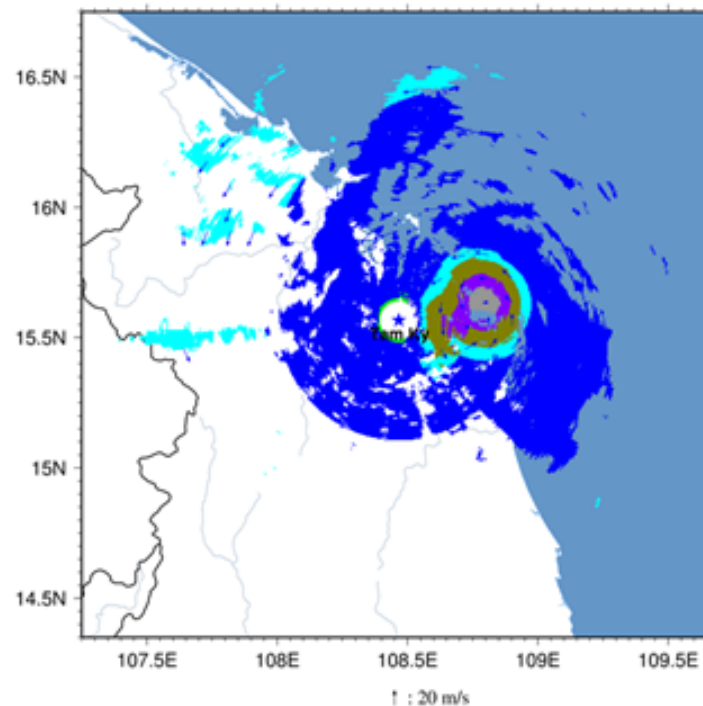
(b) Lúc 12:15 GMT ngày 14/9/2015

Wind whirls into the center of the circle (mark the circle on the image).
This vortex is located on the zero line defined as the storm center

Analysis vector wind field and horizontal wind speed on CAPPI 1 km

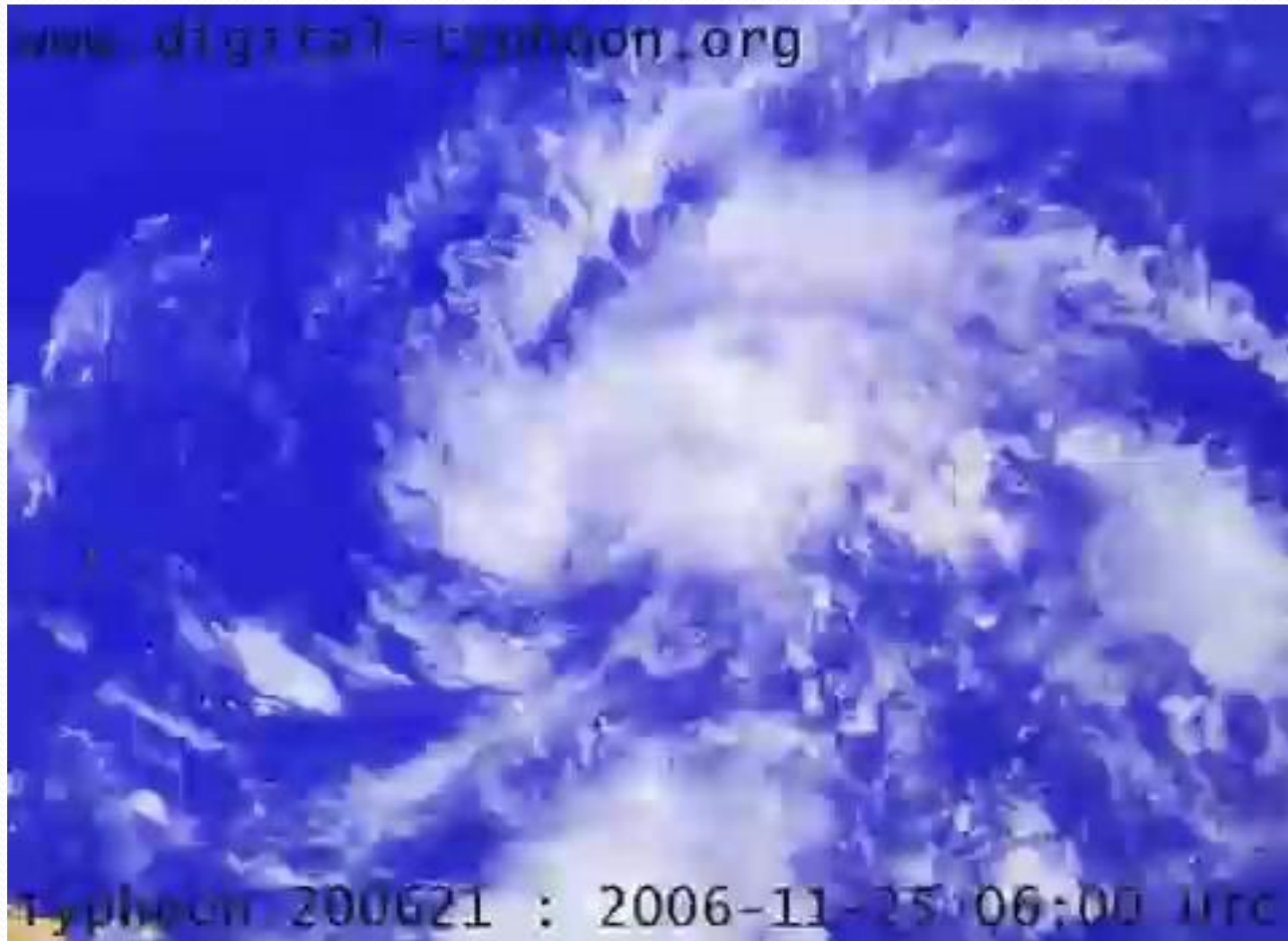


(a) lúc 11:45 GMT ngày 14/9/2015



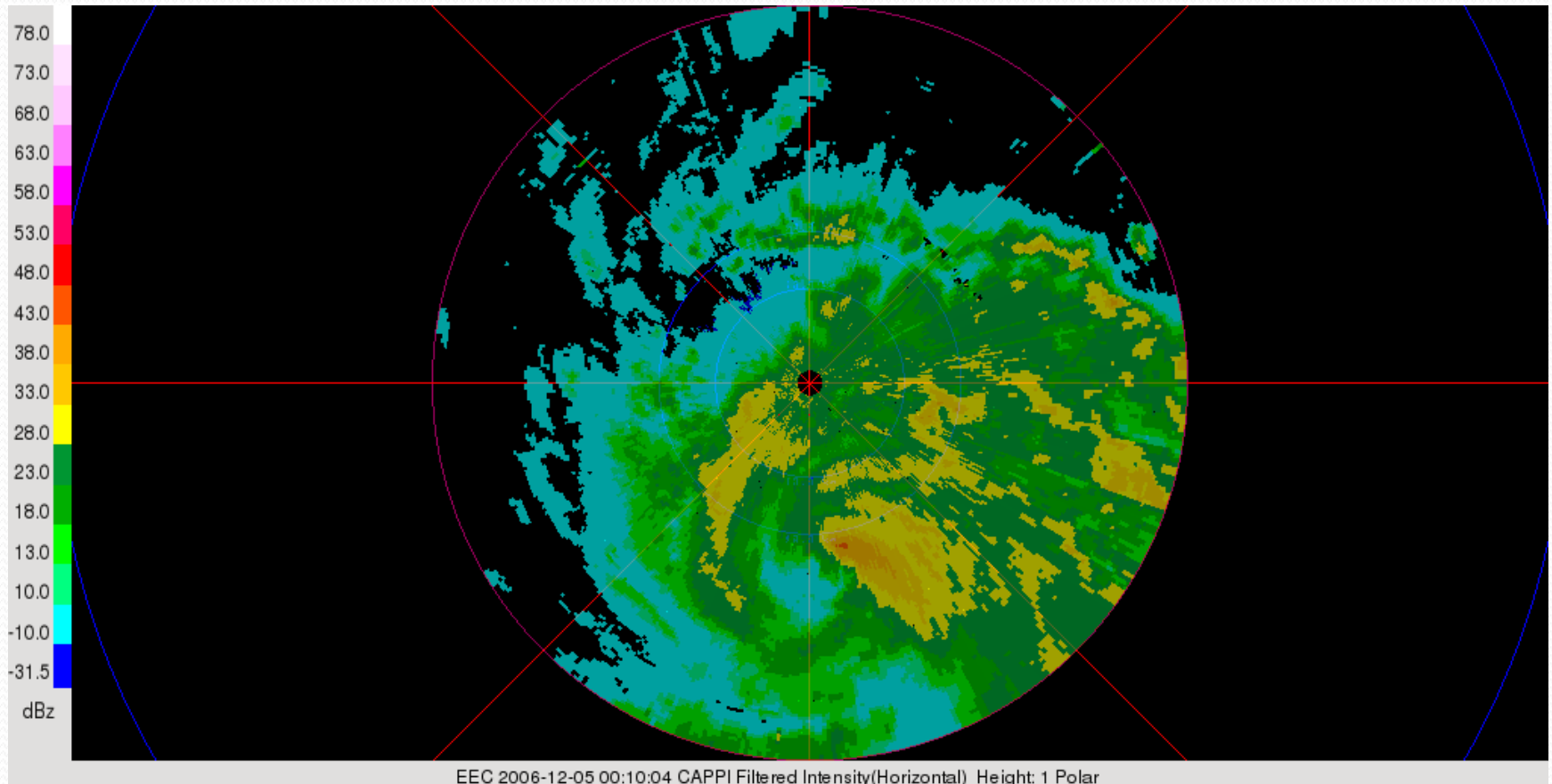
(b) lúc 12:15 GMT ngày 14/9/2015

DURIAN (2006)



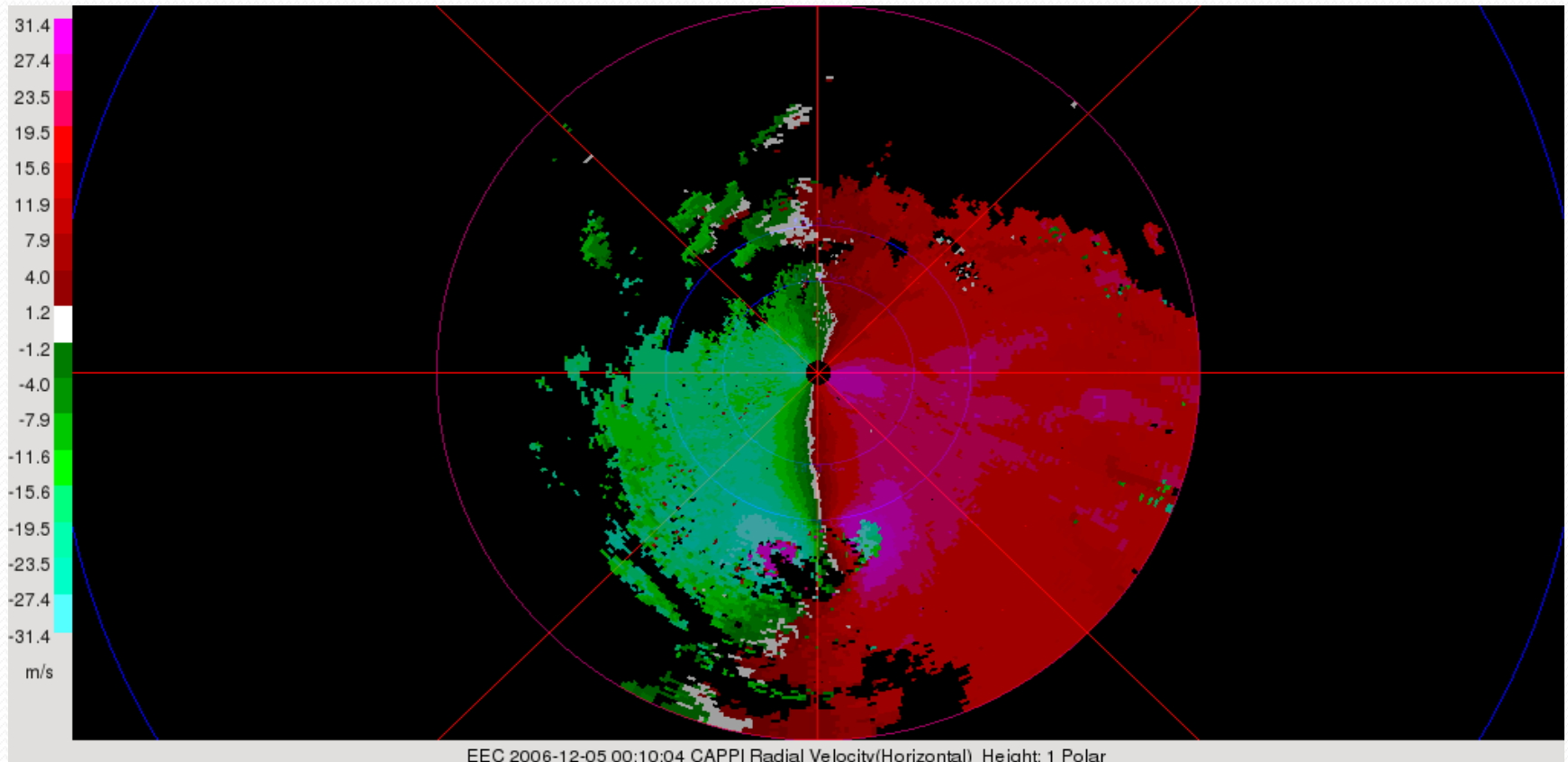
Source: youtube

Analysis of wind and reflectivity fields when using only products created from EEC software



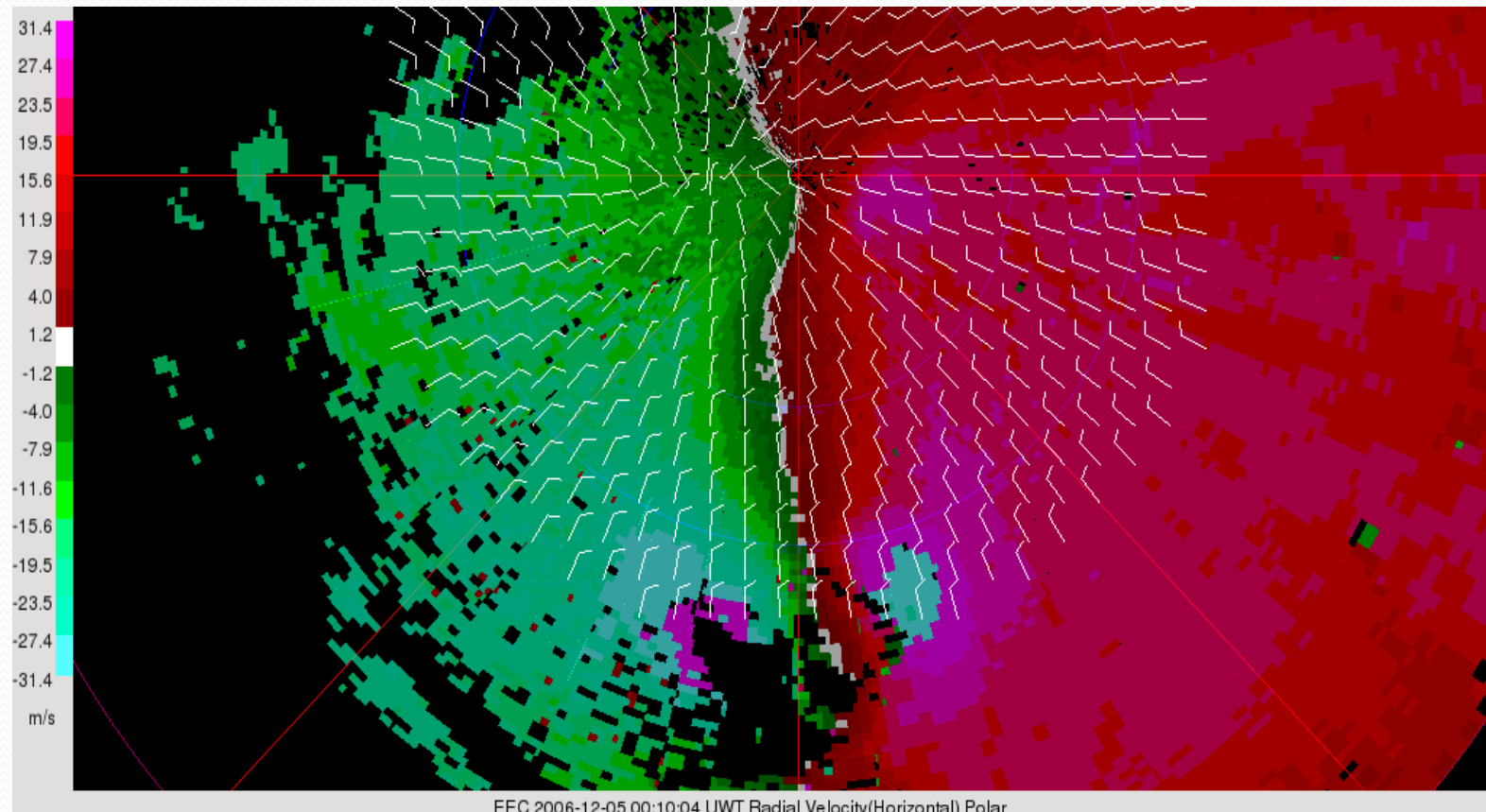
CAPPI 1 km at 00:10 GMT 5/12/2006 of Nha Be Station

Distribution of the radial wind field



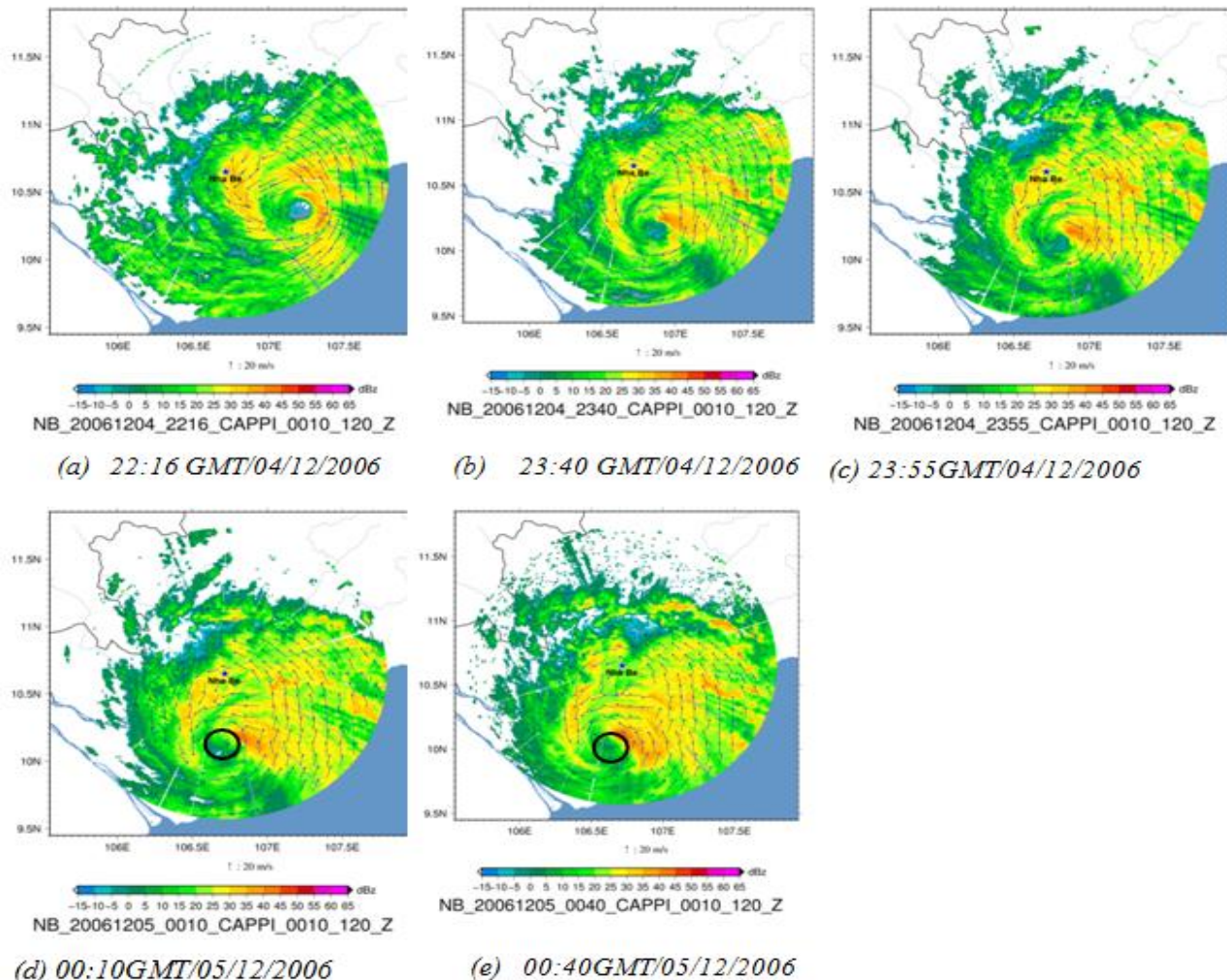
Doppler Wind at 00:10 GMT 5/12/2006 of Nha Be Station

Distribution of horizontal wind field



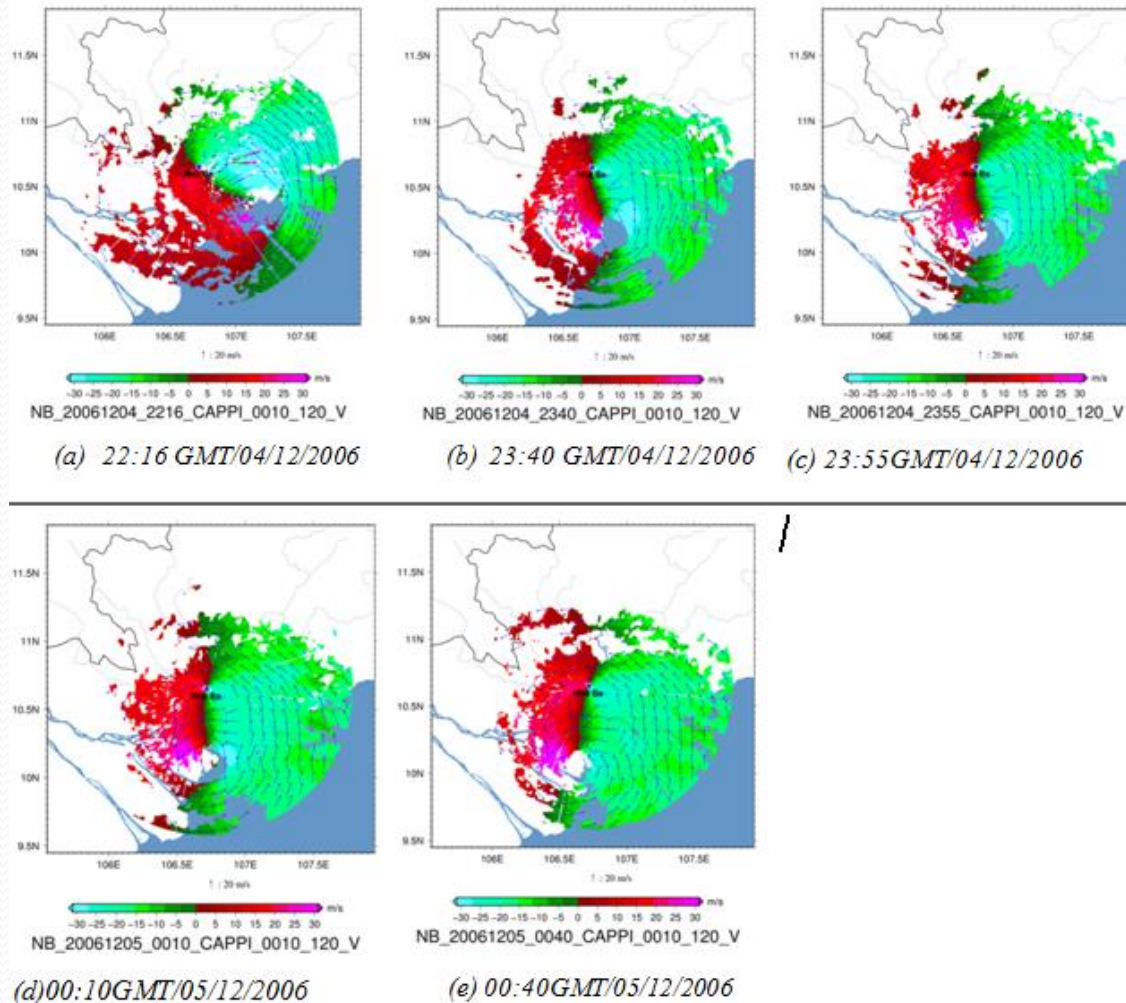
- UWT products of EEC software
- at 00:10 GMT on DECEMBER 5th, 2006 at Nha Be station

Analysis of wind and reflectivity characteristics when using additional products generated from the software extract and display the horizontal wind from the radial wind of the topic.



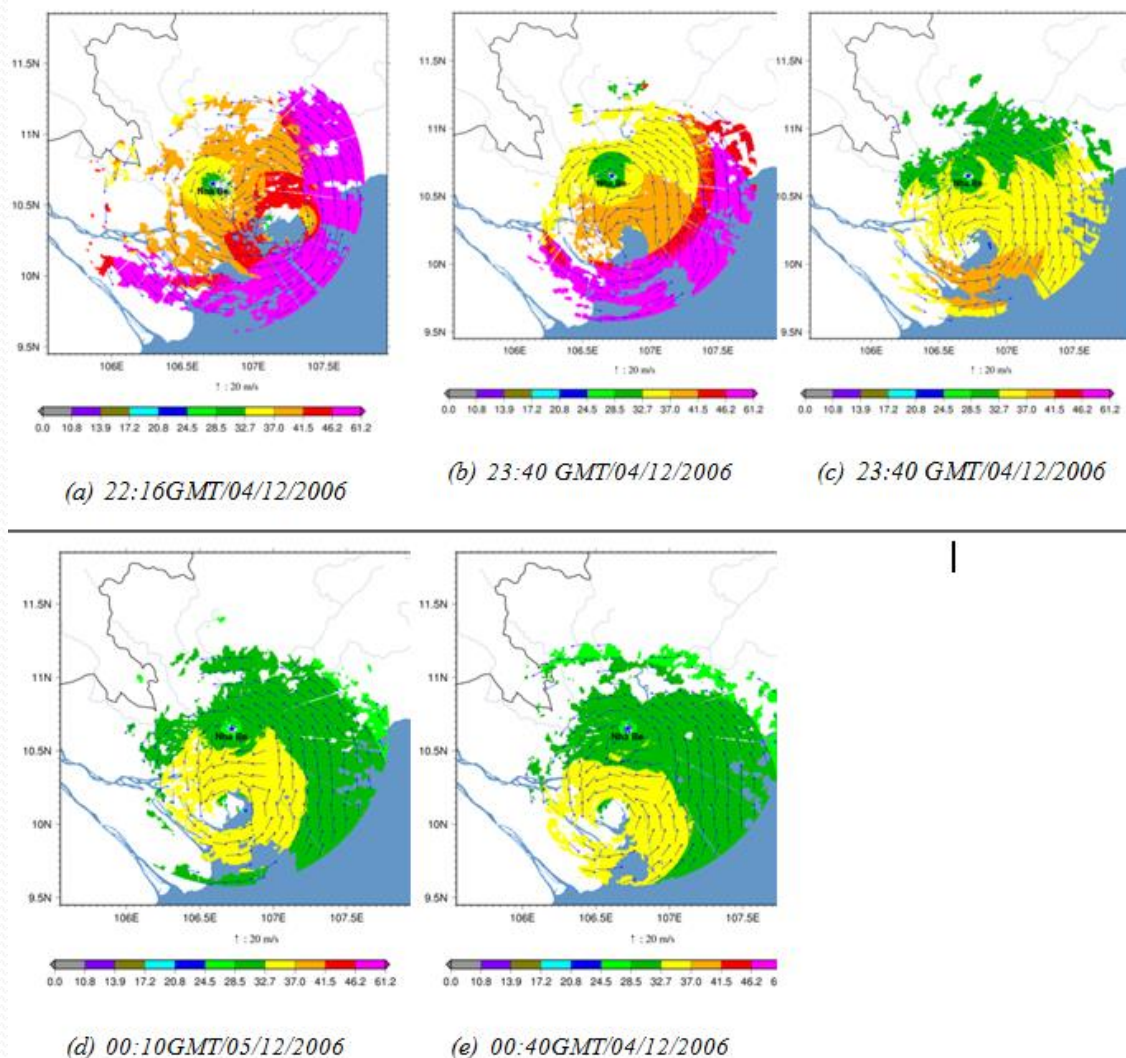
Hình 5.22. Sản phẩm tích hợp gió ngang và PHVT trên CAPPI 1km tại trạm Nhà Bè

The product integrates horizontal wind field and radial wind radius on the CAPPI 1 km



Hình 5.23. Sản phẩm tích hợp trường véc tơ gió ngang và gió xuyên tâm trên CAPPI 1 km tại trạm Nhà Bè

The product integrates vector and horizontal velocity wind field on the CAPPI 1 km



Hình 5.24. Sản phẩm tích hợp trường véc tơ và trường tốc độ gió ngang trên CAPPI 1 km tại trạm Nhà Bè

Conclusions

- Should use 3 products displaying horizontal wind (on the reflectivity field, on the background Wind field radial, horizontal wind speed field).
- If we use only reflectivity field or Doppler wind speed, we have many difficulties, especially in cases when the storm cloud field has thickened or in case of eye storm it is not clear on reflectivity image.
- Moreover, the horizontal wind distribution shown on the products extracted from this method is more authentic and distinct than that on the UWT product of the EEC software.
- Further research: Calibration and integration three dimension of real wind field retrieved with 10 m wind field to determine change of storm intensity.



Thank you for your attention