International Civil Aviation Organization

FOURTH MEETING OF ASIA/PACIFIC METEOROLOGICAL REQUIREMENTS TASK FORCE (MET/R TF/4)

Tokyo, Japan, 2 – 3 July 2015

Agenda Item 4: MET required to support end user system (CDM, AT/ATFM)

DEVELOPMENT OF METEOROLOGICAL SERVICES FOR THE TERMINAL AREA IN CHINA

(Presented by China)

SUMMARY

This paper presents the development the meteorological services for the terminal area in China.

1. Introduction

1.1 In response to users' requirement on the new weather capability support for the operation in terminal area and to bridge the gap between the TAF and en route forecast, Air Traffic Management Bureau of CAAC (hereafter as ATMB of CAAC), which provides aeronautical meteorological service in China, cooperating with Hong Kong Observatory, launched its meteorological services for the terminal area program in 2010.

1.2 Progress has been made on meteorological services for the terminal area in 3 regional aviation meteorological centers, which provide weather service for 3 busiest airports in China: Beijing, Shanghai and Guangzhou airports.

2. Discussion

2.1 Cooperation between ATMB of CAAC and Hong Kong Observatory on the Meteorological Services for the Terminal Area

2.1.1 Focal points were designated to provide each other updates of the work, and to share the resources like data and technology;

2.1.2 A joint workgroup meeting is held annually to provide an opportunity for both sides to discuss challenging issues.

2.2 Arrangement of the research on the Meteorological Services for the Terminal Area

The workgroup is divided into 3 sub-groups, and each sub-group focuses on one particular weather element: Beijing Regional Aviation Meteorological Center works toward developing icing forecast, convection and wind are the responsibility of Guangzhou and Shanghai Regional Aviation Meteorological Centers respectively.

2.3 Meteorological Services for the Terminal Area products

2.3.1 Convection forecasts on trial use in Guangzhou Airport

From July 2013, as the meteorological support for ATM decision making, the convection nowcast products have been provided for Guangzhou terminal area as trial products. Observations and forecasts of the convection in the terminal area are disseminated to Area Control Center, Terminal Control Center, Flight Service Center and Operations Control Center in Guangzhou via intranet. The forecast of the convection was valid for 1 hour and gets updated every 6 minutes till April 2014. Since then, the period of validity has been extended to 2 hours.

Fig 1. Forecast of convection as trial products to support for ATM decision making

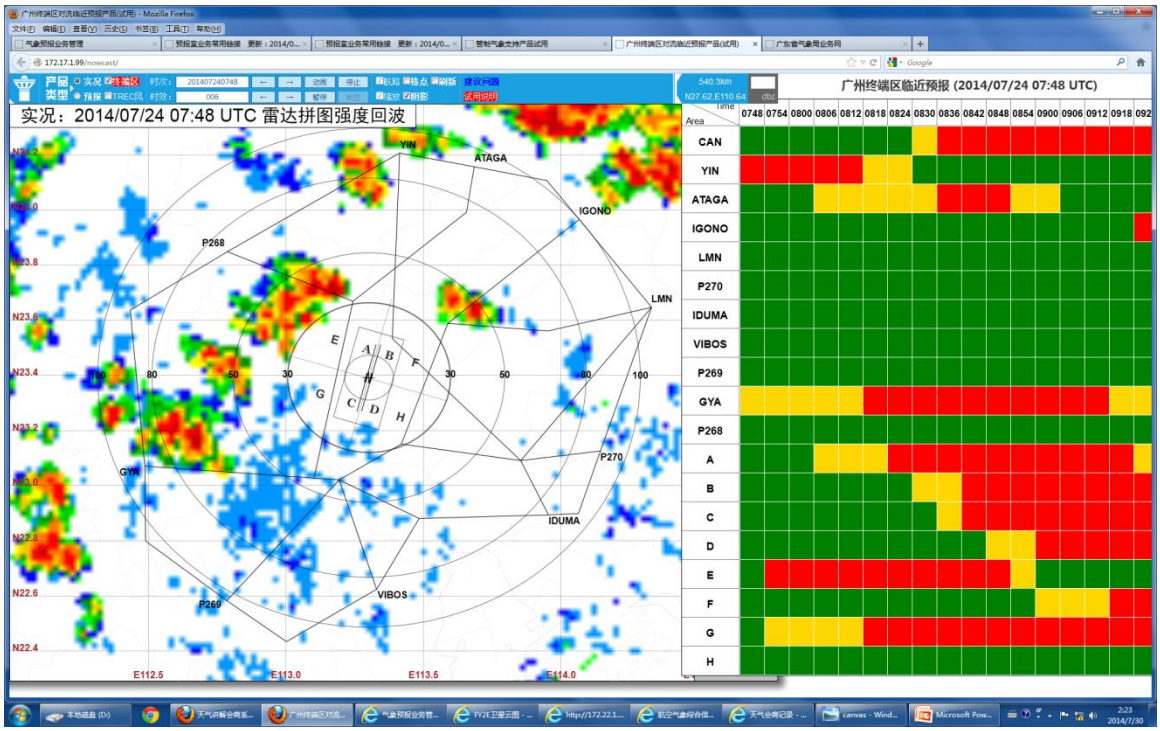

Fig. 2 Observation of convection and its impact at Key ATC points

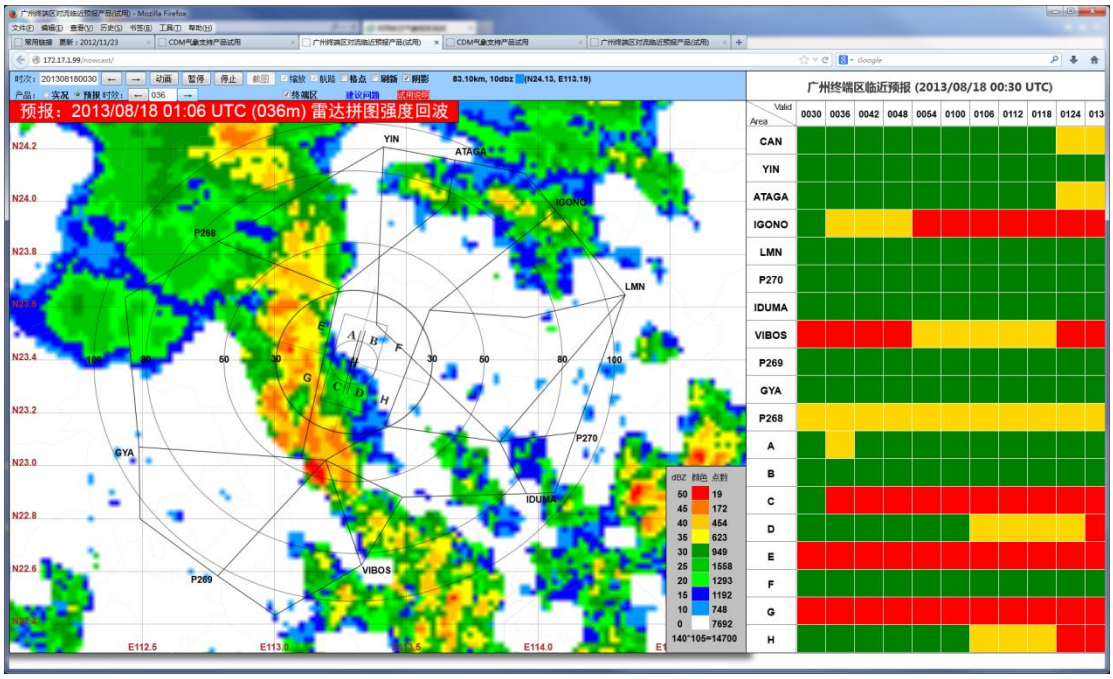

Fig. 3 Forecast of convection and its impact at Key ATC points

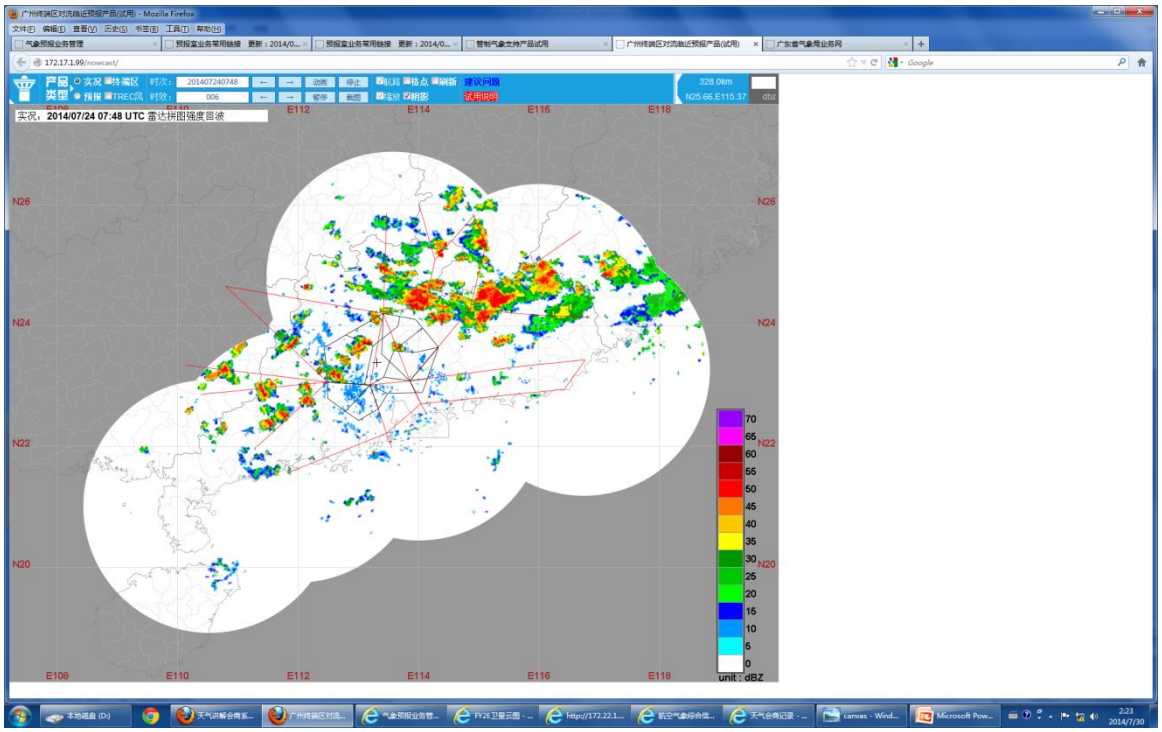

Fig. 4 Observation of convection in a larger region

Valid time (min)	June 2014		July 2014		August 2014		Sept. 2014	
	CSI	CSI (red)	CSI	CSI (red)	CSI	CSI (red)	CSI	CSI (red)
06	0.75	0.69	0.72	0.73	0.67	0.62	0.64	0.7
12	0.64	0.58	0.59	0.62	0.55	0.49	0.53	0.57
18	0.56	0.5	0.51	0.54	0.48	0.41	0.45	0.49
24	0.5	0.44	0.44	0.48	0.42	0.35	0.39	0.42
30	0.44	0.39	0.39	0.42	0.37	0.31	0.35	0.36
36	0.4	0.35	0.34	0.38	0.33	0.27	0.31	0.32
42	0.36	0.32	0.3	0.34	0.3	0.24	0.28	0.28
48	0.33	0.29	0.27	0.31	0.28	0.22	0.26	0.25
54	0.3	0.27	0.24	0.28	0.26	0.2	0.24	0.23
60	0.27	0.25	0.22	0.26	0.24	0.18	0.22	0.21
90	0.19	0.19	0.14	0.17	0.18	0.13	0.16	0.13
120	0.14	0.15	0.1	0.12	0.14	0.1	0.12	0.09

Fig. 5 Accuracy of forecast of convection in August 2013

Users' feedback:

After nearly 2 years' use, ATC users think that the total performance of the forecast of convection is good, especially,
(1) User –friendly interface, appropriate update frequency: helpful to ATM decision making;
(2) Extension of period of validity to 2 hours: providing controllers with more direct information on future adverse weather and its impact on ATM; and

(3) Forecast of convection and its impact at Key ATC points in the airport and terminal area: helping controllers on the management of landing/taking off in the airport and the assistance of aircraft avoidance of convection zone.

On the other hand, improvements need to be done on the following aspects:
(1) Accuracy of forecast of convection, especially the onset or cessation of the convection weather; and
(2) more work should be done to optimize the algorithm of the impact of convection on ATM.

2.3.2 Demonstration of the icing and wind forecasts

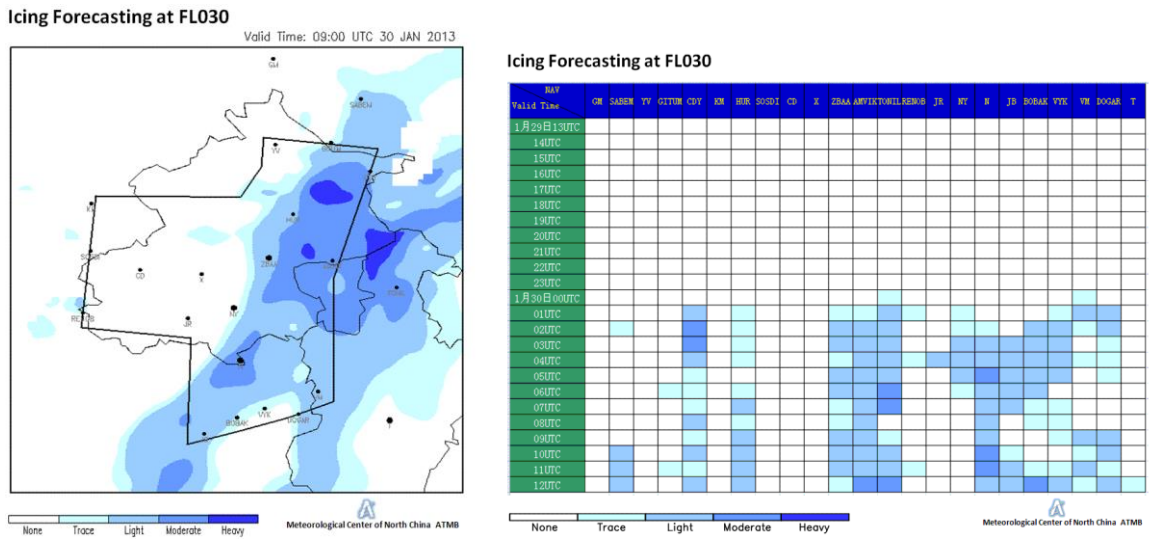

Fig. 6 Icing forecast

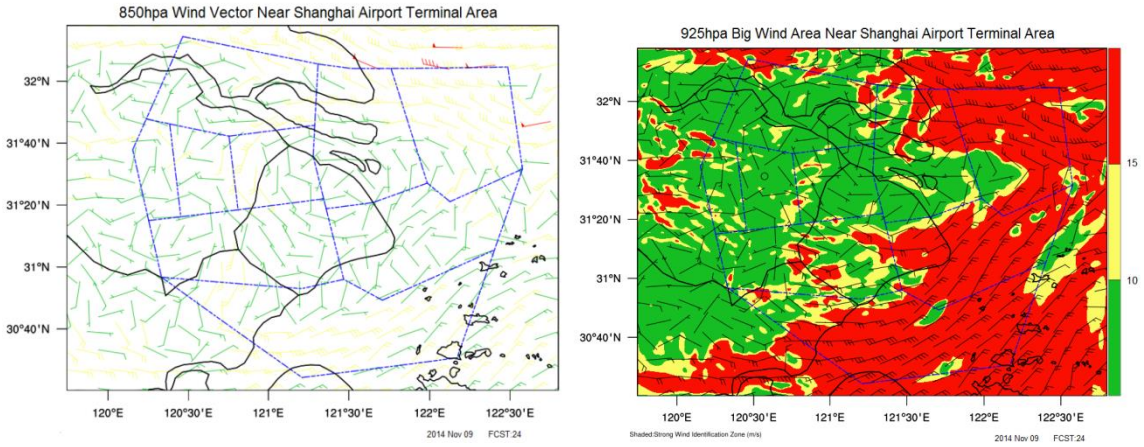

Fig. 7 Wind forecast

2.4 Future work

a) To introduce the demonstration products to users, solicit users for input, and to improve the Meteorological Services for the Terminal Area according to user responses;

b) To provide Meteorological Services for the Terminal Area products to users; and

c) To proceed with the research of other weather elements of the Meteorological Services for the Terminal Area.

3. Action by the Meeting

3.1 The meeting is invited to note the information contained in this paper.

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