



飛行氣象 WEATHER ON WINGS



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天文台制訂國際指引

天文台科學主任陳世倜先生在2004年8月獲國際民用航空組織(ICAO)選派，發展一本品質管理系統的手冊。這項工作與ICAO在2001年引進的建議有關，使所有締約國為國際航空提供氣象服務方面建立符合ISO 9000的品質管理系統。雖然ISO 9000的品質保證標準提供了一個基本的框架，作為發展品質保證計劃，但各國須訂定計劃內的細節。這本由國際民用航空組織及世界氣象組織共同出版的手冊，旨在協助各國設計、發展及實行它們自己的品質管理系統。

作為這項發展工作的一部份，陳先生在2004年12月前往位於加拿大滿地可的ICAO總部。在逗留滿地可的兩星期期間，他與ICAO導航局氣象處一同工作，制訂該手冊的最後草稿。陳先生說：「天文台是世界上首批在航空氣象服務方面取得ISO 9000認證的氣象當局之一，這次工作是一個極佳的機會，讓我們在國際間為提供優質航空服務方面的努力作出貢獻。」

The Observatory Develops International Guidelines

Mr. S.T. Chan, Scientific Officer of the Observatory, took up an assignment with the International Civil Aviation Organization (ICAO) in August 2004 to develop a manual on quality management systems. The assignment follows ICAO's introduction in 2001 as recommended practices for all

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陳世倜(左)與國際民航組織導航局局長 William R. Voss 在滿地可總部合攝

S.T. Chan (left) and William R. Voss, Director of ICAO's Air Navigation Bureau at the ICAO Headquarters, Montreal

天文台的品質管理系統 — 為世界樹立模範

國際民用航空組織的官方期刊在2004年7月號刊登了天文台的一篇有關品質管理系統的文章，天文台是世界上首批在國際航空方面獲得ISO 9001:2000認證的氣象服務單位之一。這篇特邀文章的題目為「ISO品質管理系統增強航空氣象服務」，國際民航組織透過該文章及其他工作，向航空氣象界展示如何實施品質管理系統，及這系統如何有助於提供優質、及時和反應迅速的天氣服務。該文章可在國際民航組織的網頁 <http://www.icao.int/icao/en/jr/2004/5904.djvu> 或天文台的網頁 <http://www.weather.gov.hk/publica/reprint/r551.pdf> 瀏覽。

The Observatory's Quality Management System — Showcase to the World

The July 2004 issue of the official journal of the International Civil Aviation Organization (ICAO) carries an article from the Observatory on quality management system. The Observatory is one of the first in the world awarded an ISO 9001:2000 certification for its weather services for international air navigation. An invited article, "ISO Compatible Quality Management System Enhances Aviation Weather Services", is one of the steps taken by ICAO to show how to implement a quality management system for aviation weather services and to demonstrate to the aviation community how such a system could help provide quality, timely and responsive weather services. The article can be viewed on the ICAO website at <http://www.icao.int/icao/en/jr/2004/5904.djvu> or on the Observatory's website at <http://www.weather.gov.hk/publica/reprint/r551.pdf>.

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ISO compatible quality management system enhances aviation weather services

SHARON LAU
HONG KONG OBSERVATORY
(CHINA)



天文台在國際舞台上再進一步

天文台台長林超英先生於 2004 年 12 月再度獲選為世界氣象組織第二區域協會(亞洲)的副主席，選舉是在第二區協第十三次屆會中舉行。這次屆會為香港歷來主辦最大型的氣象部門首腦會議，出席的代表人數破了協會的記錄。香港作為東道主所作出的工作備受讚賞，而香港在促進區域氣象服務發展方面提供的意見亦受到各代表的高度評價。

林先生認為他的獲選反映了亞洲各國對天文台的信任，以及肯定香港在公眾和航空氣象服務的成績。當談及作為副主席的抱負時，他說：「我們很高興見到天文台建議協助亞洲的發展中國家改善氣象服務的兩個區域性項目在會議上獲得支持。在未來數年，香港將會在推動這些項目方面擔當積極的角色。」

第一項計劃與航空氣象有關，將發展數值天氣預報產品，以協助發展中國家製作航空天氣預報和天氣圖，最終目標為加強區內的航空安全和效益。

為協調區內的航空氣象發展，天文台的岑智明先生獲任命為區內的航空氣象計劃報告員。

第二項計劃則推動區內先進的天氣中心為發展中國家提供個別城市的數值天氣預報產品，從而協助發展中國家的天氣中心制訂未來數天的城市天氣預測。

在逗留香港期間，第二區協的代表和世界氣象組織的官員獲邀參觀天文台的機場氣象所，他們十分欣賞天文台使用激光雷達等先進科技來提供航空氣象服務。



天文台台長林超英先生(中)在香港主辦的第二區協(亞洲)第十三次屆會上主持會議

Mr. C.Y. Lam, Director of Hong Kong Observatory (middle), chairing a meeting at the 13th Session of RA II (Asia) hosted by Hong Kong

有關成本回收及行政的區域性研討會

劉心怡

世界氣象組織在 2004 年 12 月 4 至 6 日於香港舉辦成本回收及行政的區域性研討會。這是在亞洲區內第二次舉行同類型的研討會，反應十分良好，有從 29 個成員國超過 50 位人士參加，並有兩位經濟學家以特別邀請專家身份出席，包括國際民用航空組織(ICAO)的 Paul Hooper 博士，他介紹在提供航空氣象服務的成本回收方面 ICAO 的政策。有鑒於國家氣象和水文部門(NMHSs)現時正面對全球化及商業化等多種挑戰，研討會亦談及面對這些挑戰時可能使用的策略，以及區內的 NMHSs 的成本回收機制和撥款模式。

Regional Seminar on Cost Recovery and Administration

S.Y. Lau

The World Meteorological Organization (WMO) held a regional seminar on cost recovery and administration in Hong Kong from 4–6 December 2004. This is the second seminar of its kind for the Asia region. The seminar was well attended with over 50 participants from 29 member countries. There were also two

The Observatory Taking a Further Step in the International Arena

The Director of the Hong Kong Observatory, Mr. C.Y. Lam, was re-elected vice-president of Regional Association II (Asia) [RA II] of the World Meteorological Organization (WMO) in December 2004. The re-election was made during the 13th session of RA II, which was the biggest meeting of heads of weather services ever hosted by Hong Kong. The number of delegates attending this session was a record for the Association. Hong Kong was highly regarded by delegates both as the host and an WMO member which had contributed good ideas to promote the development of meteorological services in the region.

Mr. Lam remarked that his re-election reflected the trust of the Asian countries in the Observatory and the achievement of Hong Kong in the public and aviation weather services. When talking about his vision in the tenure of the vice-president, he said: “We are happy to see that the two regional projects proposed by the Observatory to help developing countries in Asia improve their weather services were supported by the meeting. In the coming years, Hong Kong will play an active role in moving these projects forward.”

Pertaining to aviation meteorology, the first project will develop numerical weather prediction products to support developing countries prepare aviation forecasts and charts, in order to achieve the ultimate goal of enhancing aviation safety and efficiency in the region.

To co-ordinate the developments in aviation meteorology in the region, Mr. C.M. Shun of the Observatory was appointed as the Rapporteur on Regional Aspects of the Aeronautical Meteorological Programme in the region.

In the second project, advanced weather centres in the region will generate city-specific numerical weather prediction products to help weather centres in developing countries formulate weather forecasts for cities up to several days ahead.

During their stay in Hong Kong, delegates of RA II and WMO officials were invited to visit the Airport Meteorological Office of the Observatory. They were impressed with the Observatory's exploitation of cutting-edge technology, such as the Light Detection and Ranging (LIDAR) system, in providing aviation weather services.

第二區協由亞洲三十五個成員國組成，在世界氣象組織的框架下，它負責協調區內的氣象及相關事宜，並確保與世界其他區域接軌。

RA II consists of 35 Members in Asia. Under the WMO framework, it is responsible for co-ordinating meteorological and related activities in the region and ensuring that these go hand in hand with other regions in the world.

economists as invited experts, including Dr. Paul Hooper from the International Civil Aviation Organization (ICAO) presenting ICAO's policies on cost recovery for provision of aviation weather services. Considering the many challenges now facing the national meteorological and hydrological services (NMHSs), such as globalization and commercialization, the seminar looked at potential strategies to meet these challenges as well as cost recovery mechanism and funding models of NMHSs in the region.

ICAO 在航空氣象服務的成本回收方面的政策，法律地位建基於芝加哥協定第 15 條，並於文件 9082「ICAO 在機場及導航服務的收費政策」中闡釋。收費可包括提供與航空有關服務時的「直接」費用以及「核心」氣象服務的費用，成本回收政策必須公平、合理並得到用戶同意。

ICAO policy on cost recovery for aviation weather services has the legal basis from Article 15 of Chicago Convention and is elaborated in Doc 9082 entitled “ICAO's Policies on Charges for Airports and Air Navigation Services”. The costs can cover both “direct” costs of providing aviation-related services as well as those for the “core” weather services. It should be fair, equitable and agreed with users.



ICAO 的 Paul Hooper 博士(站立者)在區域性研討會上介紹在提供航空氣象服務的成本回收方面 ICAO 的政策和指引。Dr. Paul Hooper (standing) from ICAO presenting ICAO's policies and guidance on cost recovery for provision of aviation weather services at the regional seminar

與內地機構建立更緊密伙伴關係

天文台高級科學主任岑智明先生在 2004 年 9 月被委任為國際民用航空組織(ICAO)的世界區域預報系統運行組(WAFSOPSG)中國代表的永久顧問。

該運行組由 ICAO 在 2003 年成立，旨在確保世界區域預報系統的運作與發展會繼續以合乎成本效益的方法，滿足現時及不斷改變的業務要求。現時兩個世界區域預報中心為氣象所提供高空風及溫度預測和航路上重要天氣預測，讓它們製作飛行文件，以支援國際航班。這運行組的成員包括兩個世界區域預報中心供應國(英國及美國)、數個世界區域預報系統使用國、世界氣象組織、國際性的航空公司組織和機師組織。中國民用航空總局氣象處副處長須劍良先生為該運行組的中國代表。

在此委任前，岑先生已經積極參與 ICAO 在亞太區的航空氣象工作，他現時為該區的世界區域預報系統實施工作小組主席，和通訊/導航/監察及氣象小組副主席。他說：「這次委任我為須先生的永久顧問，是一個非常好的機會加強天文台與中國民航總局的緊密聯繫，讓我們可以為早在 1980 年代構思的世界區域預報系統的發展作出更多的貢獻。」



The Observatory Develops International Guidelines

(continued from P.1)

Contracting States the establishment of ISO 9000-compliant quality management systems for the provision of meteorological services for international air navigation. While the ISO 9000 series of quality assurance standards provides a basic framework for the development of a quality assurance programme, the details of such a programme have to be formulated by the individual States. The manual, to be published jointly by ICAO and the World Meteorological Organization (WMO), is intended to assist States in the design, development and implementation of the quality management systems of their own.

As part of the assignment, Mr. Chan made a 2-week trip to the ICAO Headquarters in Montreal, Canada in December 2004. During his stay in Montreal, Mr. Chan worked with the Meteorological Section of the Air Navigation Bureau of ICAO to finalize the draft manual. "The Observatory is one of the first meteorological authorities in the world which has obtained ISO 9000 certification in the provision of aviation weather services. The Assignment provides an excellent opportunity for us to contribute to the worldwide effort towards the provision of quality services for aviation", Mr. Chan said.

Closer Partnership with Mainland Authority

Mr. C.M. Shun, Senior Scientific Officer of the Observatory, was appointed as the permanent advisor to the representative of China in the ICAO's World Area Forecast System Operations Group (WAFSOPSG) in September 2004.

The WAFSOPSG, formed by ICAO in 2003, is tasked to ensure that the operation and development of the World Area Forecast System (WAFS) would continue to meet current and evolving operational requirements in a cost effective manner. Currently, two World Area Forecast Centres (WAFCs) provide upper-air wind and temperature forecasts and en-route significant weather forecasts for meteorological offices to prepare flight documentation in support of international flights. The WAFSOPSG consists of members from the two WAFS Provider States (U.K. and U.S.A.), a number of WAFS user States, the World Meteorological Organization (WMO) and international organizations of airlines and pilots. Mr. Xu Jianliang, Deputy Director of the Meteorological Division, Civil Aviation Administration of China (CAAC), is the nominated expert to serve in the WAFSOPSG.

Before the appointment, Mr. Shun was already actively involved in ICAO matters on aviation weather in the Asia and Pacific Regions. He is currently the Chairman of the WAFS Implementation Task Force and the Vice-Chairman of the Communications, Navigation and Surveillance / Meteorology (CNS/MET) Sub-group of the Regions. "This appointment for me to serve as the permanent advisor of Mr. Xu provides a very good opportunity to strengthen the close partnership between the Observatory and CAAC so that we may contribute more in the development of WAFS which was first conceived back in 1980's", Mr. Shun said.

岑智明(前排右)與須劍良先生(前排左)、中國民航總局和香港民航處的同事在 2004 年 7 月於泰國曼谷舉行的通訊/導航/監察及氣象小組會議上合攝

C.M. Shun (front row, right) photographed with Mr. Xu Jianliang (front row, left) and colleagues of CAAC and Hong Kong Civil Aviation Department at the CNS/MET Sub-group meeting held in Bangkok, Thailand in July 2004

激光雷達的最新發展

陳柏緯

經過近兩年成功的試驗性運行，激光雷達在 2004 年 5 月起正式投入業務運作。

激光雷達在 2002 年中安裝在香港國際機場的航空交通管制大樓的天台，在無雨情況下探測風切變。自 2002 年 8 月開始，它每星期 7 天，每天 24 小時不停運行，搜集數據。

由於飛機師報告在機場所遇到的風切變大部份在無雨的情況下出現，激光雷達證實為非常有用的工具，幫助天文台的航空天氣預報員提供風切變預警服務。自激光雷達在 2002 年 8 月試用以來，天文台所發出的風切變預警的成功率(即成功捕捉比率)上升了百分之十，達到百分之九十五左右，在同時期虛報比率亦呈下降趨勢。因此，激光雷達在 2004 年 5 月 31 日起正式在風切變預警方面作業務使用。

為進一步加強機場的風切變預警服務，天文台正優化激光雷達的風切變探測方法，及把預警自動化。此外亦有計劃在機場加裝一部激光雷達，作為現有系統的後備。有鑒於大部份航機在北跑道降落，第二部激光雷達會加強覆蓋該跑道。



在香港國際機場運作的激光雷達

The LIDAR operating at the Hong Kong International Airport

航道專用天氣圖

呂永康

在 2004 年，天文台在「航空氣象資料發放系統」提供為航道專用的重要天氣圖及高空風/氣溫圖。在此之前，天文台只能提供 T4 傳真格式的天氣圖，覆蓋幾個特定的區域。

這些天氣圖是使用從世界區域預報中心接收到的預測數據製作的。該等預測是以數字化格式編碼，提供航道重要天氣及固定座標的風/氣溫資料。利用了這些新的資料格式後，天文台可以根據航空公司所選擇的航道自動製作航道天氣圖。同時，航空公司更可以選擇不同的顯示樣式，例如顏色、字體大小及地圖投影等。以下是這些新天氣圖的例子。

Latest Development of the LIDAR

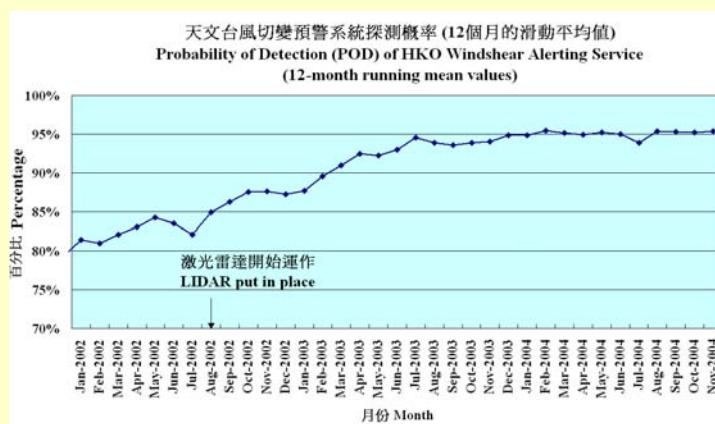
P.W. Chan

After successful trial operations for almost two years, the Light Detection And Ranging System, or LIDAR for short, was put into operational use in May 2004.

The LIDAR was installed on the rooftop of the Air Traffic Control Complex of the Hong Kong International Airport in mid-2002 for windshear detection under non-rainy weather conditions. It has been collecting data in a continuous manner, i.e. 24 hours a day, 7 days a week, since August 2002.

As a majority of pilot reported windshear events at the airport occur in non-rainy weather conditions, the LIDAR is proven to be an extremely useful tool for the Observatory's aviation forecasters in the provision of the windshear alerting service. Since the trial use of the LIDAR in August 2002, the hit rate (i.e. probability of detection) of windshear alerts issued by the Observatory has increased by 10% to around 95%. Over the same period, the false alarm rate was on a decreasing trend. In this connection, the LIDAR was commissioned for operational use in windshear alerting with effect from 31 May 2004.

To further enhance the windshear alerting service for the airport, the Observatory is working to further sharpen the LIDAR based windshear detection methods and to automate the alerts. There is also a plan to set up another LIDAR at the airport, both to back up the existing LIDAR and to improve coverage over the northern runway over which most of the landing approaches are made.



天文台風切變預警的成功率

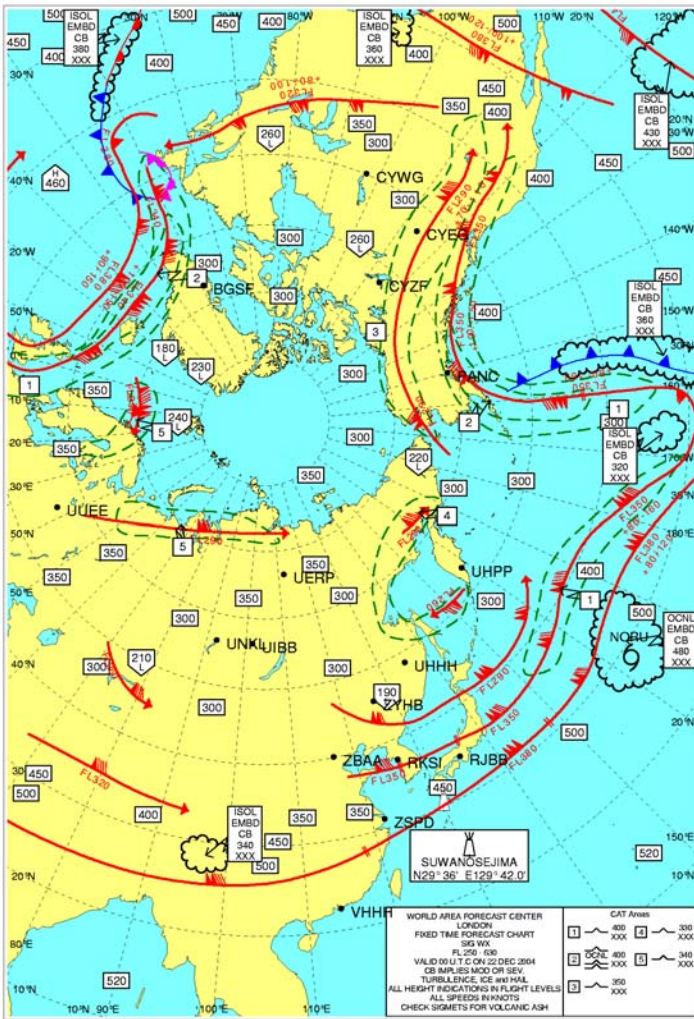
Hit rate of the Observatory's windshear alerts

Customized En-route Weather Charts

W.H. Lui

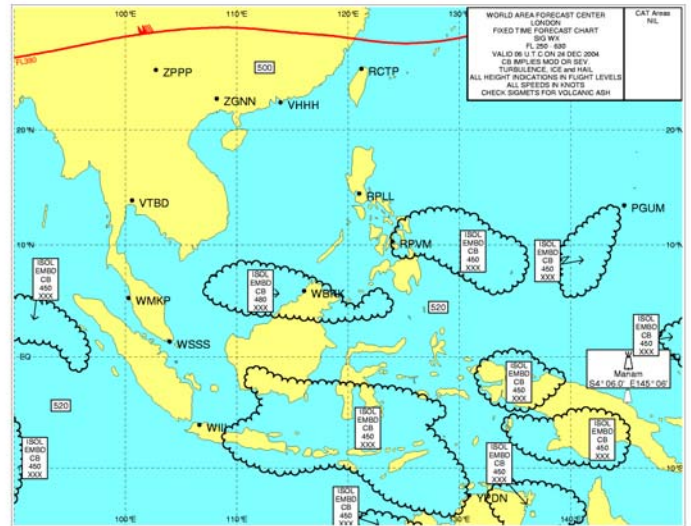
In 2004, weather charts depicting significant weather and upper wind/temperature for specific flight routes became available on the Observatory's web based Aviation Meteorological Information Dissemination System (AMIDS). Hitherto, only charts in T4 fax format covering a few prescribed areas could be provided.

The charts are prepared using forecasts received from the World Area Forecast Centres. These forecasts are encoded in digital formats which provide the locations of the en-route significant weather as well as the wind and temperature at regular coordinates. These new data formats have enabled automatic generation of en-route weather charts for flight routes selected by airlines and in presentation style such as colour, font size and map projection specified by airlines. Samples of the new weather charts are shown below.



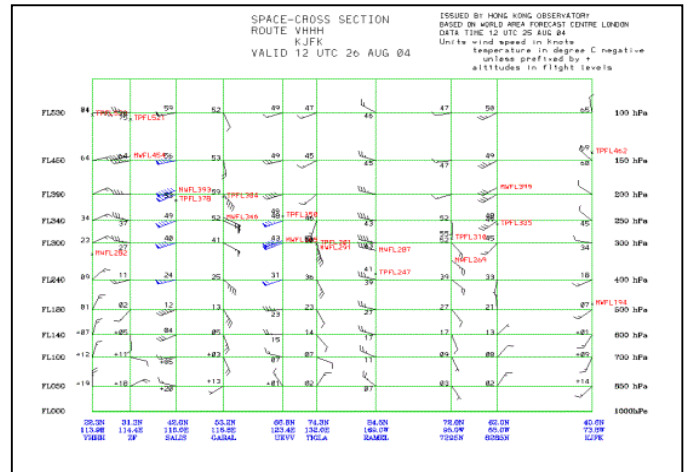
圖一 香港與北美洲之間的極區航路重要天氣圖

Figure 1 SIGWX chart for polar routes between Hong Kong and North America



圖二 東南亞地區專用的重要天氣圖，覆蓋香港和泰國之間的航路

Figure 2 SIGWX chart tailor-made for southeast Asia covering the Hong Kong - Thailand route



圖三 特別為香港飛越極區前往紐約的航路所製作的垂直空間剖面

Figure 3 The vertical space cross-section tailor-made for a route from Hong Kong to New York via the polar region

機場氣象觀測系統升級

李淑明

在 2004 年 11 月，天文台同事經過多個月來的努力，全面翻新及提升了機場氣象觀測系統的硬件及軟件。

升級後的系統控制著香港國際機場內和鄰近地區的氣象儀器，及收集它們每秒鐘的數據，這些儀器包括風速表，跑道視程透射表，能見度儀，雲幕儀，溫度計，氣壓計及雨量計。圖像顯示為天氣預報員及航空交通控制員提供實時的天氣資料，它們既符合國際民用航空組織的最新要求，也滿足用戶的需要。



Meteorological Observing System at the Airport Upgraded

Olivia S.M. Lee

The Aerodrome Meteorological Observing System (AMOS) underwent a major hardware and software upgrade in November 2004. This is the result of months of hard work by the Observatory staff.

The enhanced system controls and collects up to one second data from the weather sensors including anemometers, runway visual range (RVR) transmissometers, visibility meters, ceilometers, thermometers, barometers and rain gauges installed inside and around the Hong Kong International Airport. The graphical displays providing real-time weather data to forecasters and air traffic controllers fully comply with the latest ICAO standards and meet users' needs.

天文台的研究助理龍達文正測試機場氣象觀測系統軟件的升級版

Mr. T.M. LUNG, a research assistant of the Observatory conducting tests on the enhanced AMOS software

由 700 公里上空觀看香港國際機場

蘇志權

在 2004 年 11 月 1 日，香港國際機場正吹北風，受到煙霞的籠罩，能見度下降至 3000 米。由當日從機場向大嶼山方向拍攝的照片(圖一，下面照片)，可見受到煙霞的遮蔽，大嶼山的輪廓難以分辨。但於兩天前，即 2004 年 10 月 30 日，機場仍吹東風，從相同角度所拍攝的照片(圖一，上面照片)，大嶼山則清晰可辨。

借助美國太空總署(NASA)的兩顆地球觀測衛星，現時可以從衛星照片觀測到機場上的煙霞了。該兩顆衛星在地球上空 700 公里的地方環繞地球運行，每日 4 次拍攝到大氣、陸地及海洋的高解像度圖像。天文台在 2004 年中安裝了一個系統接收這些衛星圖像。接收到的圖像相當精細，解像度高達 250 米，可清楚顯示香港國際機場附近的煙霞及雲的分布。圖二是在 2004 年 11 月 1 日從其中一顆衛星拍攝到的圖像，顯示一層煙霞正覆蓋著香港國際機場以至整個珠江三角洲，並與香港機場的能見度觀測吻合。

除了真彩圖像外，衛星亦提供其他產品，有助觀測海水表面溫度、葉綠素濃度及陸地上的植物分佈。天文台目前在互聯網上發放這些衛星拍攝到的真彩海水表面溫度及氣溶膠光學厚度圖像，以下是圖像的網址：

www.weather.gov.hk/wxinfo/intersat/modis/satc.html



圖一 在 2004 年 10 月 30 日(上圖)及 11 月 1 日(下圖)從機場向大嶼山方向拍攝到的照片。在 11 月 1 日，大嶼山被煙霞所遮蔽

Figure 1 Pictures of Lantau Island taken from the Hong Kong International Airport on 30 October 2004 (upper) and 1 November 2004 (lower). The view of Lantau Island was obscured by haze on 1 November 2004

Viewing the Hong Kong International Airport from 700 km Aloft

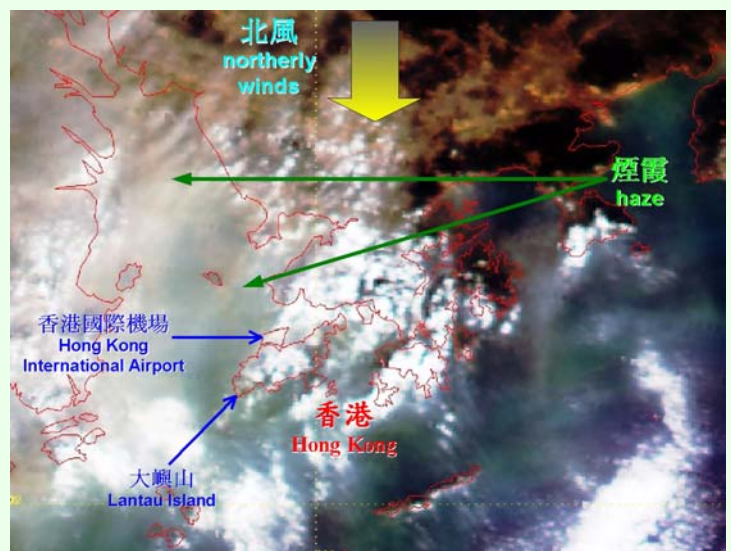
C.K. So

Under northerly winds, the Hong Kong International Airport (HKIA) was shaded by haze with visibility reduced to 3000 metres on 1 November 2004. From the camera image of the Lantau Island taken from the airport that day (Figure 1, lower photo), the silhouette of Lantau Island was hardly discernible due to the haze weather. Two days earlier on 30 October 2004, when easterlies prevailed, camera image at the same viewing angle (Figure 1, upper photo) showed vividly the Lantau Island.

The haze at the airport can now be observed on satellite images. This is made possible by two Earth Observing Satellites of NASA (National Aeronautics and Space Administration), which revolve around the earth at a height of 700 kilometres and capture high-resolution satellite images of the atmosphere, land and ocean 4 times a day. The Hong Kong Observatory installed a reception system to receive these images in mid-2004. At a fine resolution of 250 metres, the satellite imagery depicts clearly the distribution of haze and clouds around HKIA. Figure 2 is the image from one of the satellites on 1 November 2004. It shows a layer of haze covering HKIA as well as the Pearl River Estuary at large, concurring with the visibility observations at HKIA.

Apart from true colour image, the satellites also provide other products for monitoring of sea surface temperature, chlorophyll concentration in the ocean and vegetation over the land. The Observatory website now provides true colour images, sea surface temperature and aerosol optical depth images from these satellites. These can be accessible at the following address:

www.weather.gov.hk/wxinfo/intersat/modis/sat.html



圖二 2004 年 11 月 1 日地球觀測衛星的高解像度圖像，顯示煙霞正覆蓋珠江三角洲地區

Figure 2 High-resolution image from Earth Observing Satellite showing haze over the Pearl River Estuary on 1 November 2004

透過短訊服務發放天氣警報的試驗計劃

張冰

自 2004 年 9 月 1 日起，天文台試行透過短訊服務提供天氣警報，機場的用戶現在可以在他們的流動電話，以短訊方式接收到機場雷暴警報及香港熱帶氣旋警告信號，目的在於為用戶，尤其在戶外工作的人士，及時地提供最新的天氣警報。這服務是短訊服務試驗計劃的一部份，用作評估透過短訊發放天氣警報的表現。

Trial Service on Weather Warnings via SMS

P. Cheung

Hong Kong Observatory launched on 1 September 2004 a trial warning service based on Short Message Service (SMS) technology. Airport users can now receive on their cellular phones aerodrome warnings for the Hong Kong International Airport and tropical cyclone signals for Hong Kong in the form of SMS messages. The aim is to provide timely update on the latest weather warnings to users, particularly outdoor workers. The service is part of a pilot project to evaluate the performance of SMS as a means to disseminate weather warnings.



透過短訊服務在流動電話接收到的機場強風警報
Aerodrome Strong Wind Warning received on a mobile phone via SMS

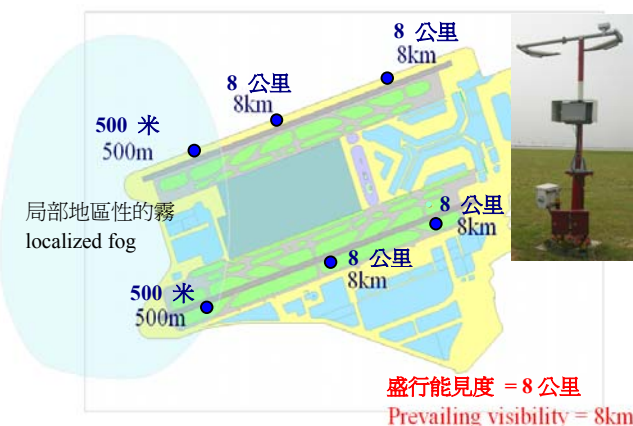
機場氣象所

機場的能見度報告

劉心怡

自 2004 年 11 月 25 日起，機場的例行及特殊天氣報告內使用盛行能見度(prevaling visibility)，而不是最低能見度(minimum visibility)。盛行能見度表示機場範圍內超過一半地區的能見度情況，被視為更能代表與航機運作有關的實際能見度。在實施了新的報告方法後，航機收到因為局部地區性的霧而發出的低能見度報告，以致限制了運作的機會將會減少。然而，當最低能見度偏低(小於 1500 米)，或與盛行能見度顯著不同時(小於盛行能見度的百分之 50)，最低能見度及它的大致方向亦會在例行及特殊天氣報告內提供，這是確保與安全有關的重要資料將得以保存。在國際民用航空公約附件 3 的最新版本中明確規定了這個轉變。

為觀測香港國際機場的盛行能見度，天文台在現有的跑道視程透射表旁邊安裝了六部前向散射儀。要取得這些前向散射儀所提供的最新能見度報告，機場用戶請登上天文台的網上航空天氣資訊系統——「航空氣象資料發放系統」(AMIDS)內的“Latest AMOS Data”(機場氣象觀測系統的更新數據)網頁。



Airport Meteorological Office

Aerodrome Visibility Reporting

S.Y. Lau

Since 25 November 2004, the prevailing visibility, rather than the minimum visibility, is reported in our METAR/SPECI. Prevailing visibility, which is the visibility over half of the aerodrome, is considered to be more representative of the actual visibility relating to aircraft operations. With the new reporting method, the chance of aircraft receiving low visibility reports due to isolated fog patches resulting in limiting operation will be reduced. However, if the minimum visibility is low (below 1500 m) or differs significantly from the prevailing visibility (less than 50% of the prevailing visibility), the minimum visibility together with its general direction would also be given in the METAR/SPECI such that safety critical information will not be missed. The change was specified in the latest edition of Annex 3 to the Convention on International Civil Aviation.

To support observation of prevailing visibility at HKIA, the Observatory installed 6 forward scatter meters alongside the runway visual range (RVR) transmissometers. To obtain the latest visibility reports from these forward scatter meters, airport users please visit “Latest AMOS Data” on the AMIDS – the Observatory’s online aviation weather information system.

前向散射儀(小圖)的數據可在沿著機場兩條跑道的六個位置上(地圖中的藍色點)獲取，用作確定盛行能見度。在這例子中，局部地區性的霧在機場的西部出現，引致該區的能見度下降至 500 米，但是機場餘下大部份地區的能見度維持在 8 公里，所以盛行能見度為 8 公里。

Measurements from forward scatter meters (inset) are available at six locations along the two runways of HKIA (blue dots in the map) and they are used to determine the prevailing visibility. In this example, a localized patch of fog occurs over western side of HKIA where visibility drops to 500 m, whereas the visibility remains at 8 km over the most part of the airport. So the prevailing visibility is 8 km.

進一步增強機場警報服務

劉心怡

在 2003 年中天文台推出機場雷暴警報的取消訊息，當雷暴的威脅解除時，天文台的航空天氣預報員會即時取消警報，機場的用戶因而可以更快地知悉雷暴的離開，及早恢復正常運作。這種取消機場警報的做法現已伸展至其他警報，例如機場的強風警報。從 2004 年 11 月 25 日起，每當機場警報所針對的天氣情況預計不再出現時，警報便會取消。這種新做法同時也是國際民用航空公約附件 3 內所刊載的最新建議之一，經增強後的警報服務可望更好地滿足航空界的需要。

為花式飛行表演提供氣象支援

蔡本良

你是否欣賞著名的法國空軍花式飛行表演隊 (Patrouille de France) 在 2004 年 10 月 20 日的表演？為支援這次表演，天文台自飛行隊的機師在 10 月 17 日抵達香港開始，每天都為他們作天氣簡報。在表演當天，天文台並派遣一位天氣觀測員前往港島南區的表演場地，提供第一手天氣訊息。此外，海事處亦樂意襄助，在該天更頻密地提供香港水域的能見度資料。

所有預備工作都沒有白費。表演隊的阿爾法噴射機在半小時內作出 27 個花式，令在場的觀眾著迷。他們也沒有忘記香港國際機場的乘客和工作人員，當噴射機即將降落機場時，還在北跑道進行低空飛行，作額外的花式呢。



圖 1 阿爾法噴射機在港島南區表演(相片由 Mr. Phil Parker 提供)

Figure 1 Alpha jets in action over the southern part of Hong Kong Island (photo courtesy of Mr. Phil Parker)

Further Enhancement to Aerodrome Warning Service

S.Y. Lau

Cancellation message of aerodrome thunderstorm warning was introduced in mid-2003. Once the threat of thunderstorm is over, the Aviation Forecaster of the Observatory would cancel the warning. The airport users are now more promptly informed of the receding of thunderstorms such that they can resume normal operations earlier. This practice to cancel aerodrome warnings is now extended to other aerodrome warnings such as aerodrome strong wind warnings. From 25 November 2004, aerodrome warnings would be cancelled when the conditions are no longer expected to persist. This new practice is also in line with the recommendation in the latest edition of Annex 3 to the Convention on International Civil Aviation. It is hoped that our enhanced warning service would better meet the needs of the aviation community.

Weather Support for the Aerobatic Display

B.L. Choy

Did you enjoy the stunt routines performed by the famous French Military Aerobatic Display Team, Patrouille de France on 20 October 2004? To support the performance, the Observatory gave weather briefing to the pilots every day since their arrival in Hong Kong on 17 October. On the day of the display, the Observatory also arranged a weather observer at the southern part of Hong Kong Island to give first-hand weather information over the display region. In addition, the Marine Department kindly provided more frequent visibility observations over the Hong Kong waters on that day.

All the preparation works did pay off. Patrouille de France amazed the crowd at the scene by displaying 27 stunt routines in half an hour with their Alpha jets. The display team also did not forget the passengers and airport personnel at the Hong Kong International Airport. As the Alpha jets were about to land at the airport, an additional stunt routine was performed with a low level fly over the north runway.



圖 2 機長 Jean-Louis Roland (在本港表演時的隊長，右) 與蔡本良合照於天氣簡報會

Figure 2 Captain Jean-Louis Roland [team leader for the performance in Hong Kong] (right) and B.L. Choy at the weather briefing session

火成對流雲

大型而強烈的森林火災釋放大量的水汽，當水汽上升時可能會形成積雲，稱為火成對流雲。在 2004 年 6 月尾，加拿大的不列顛哥倫比亞省及育空地區以至美國阿拉斯加州發生森林大火，並觀察到有這種雲出現，把煙和一氧化碳帶往大氣對流層頂部及平流層下部。從在該地區飛行的一架飛機之上，於 34,000 呎高空觀看和拍攝到(右圖)其中一片火成對流雲。

Pyro-convective Cloud

Large and intense forest fires release enormous amount of water vapour that may rise and produce cumuliform clouds called pyro-convective clouds. In late June 2004, these clouds were spotted to form from forest fires over British Columbia and Yukon, Canada as well as Alaska, U.S.A., bringing smoke and carbon monoxide to the upper troposphere and lower stratosphere. One such cloud was observed and photographed (right) on board an aircraft flying at 34,000 feet in the region.



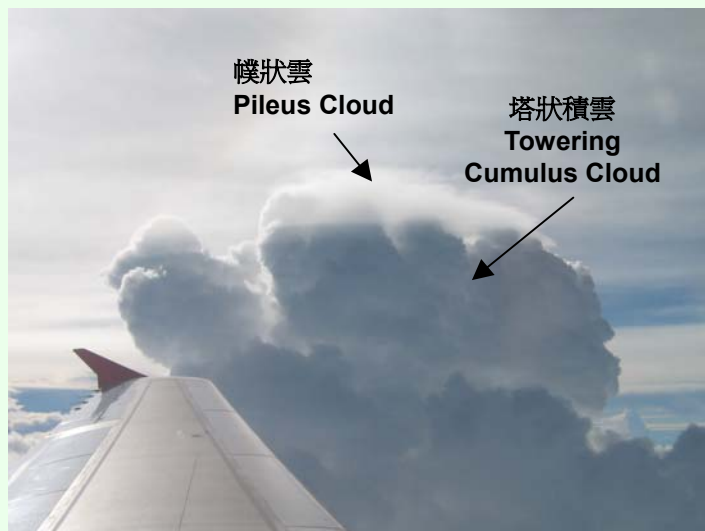
2004 年 6 月 27 日 20:48 世界時在加拿大不列顛哥倫比亞省上空觀察到的火成對流雲的照片(由日本航空藤堂憲幸先生提供)

Photograph of a pyro-convective cloud observed over British Columbia, Canada at 20:48 UTC, 27 June 2004 (courtesy of Mr. Noriyuki Todo, Japan Airlines)

幘狀雲

岑智明

以下左面的相片在 2004 年 7 月 17 日傍晚從泰國曼谷飛返香港的航機上拍攝，可見塔狀積雲向上伸延至飛機的飛行高度(超過 30,000 呎)，幘狀雲在它的上面出現。幘狀雲一般出現的時間十分短暫，當積雲猛烈地向上伸延時，遇上肉眼看不見的一層水汽，便會形成幘狀雲。它們的外表與山脈上出現的莢狀雲很相似(請參考以下在右面的相片，在 2004 年 4 月 10 日於大嶼山拍攝)，其實兩者形成的機制頗相近：一層潮濕的空氣因遇到塔狀積雲(對於幘狀雲)或山脈(對於莢狀雲)而被迫抬升。



Pileus Cloud Spotted

C.M. Shun

The left photograph below was taken on a late-afternoon flight from Bangkok back to Hong Kong on 17 July 2004. Pileus cloud was seen above a towering cumulus which rose to the altitude of the flight (more than 30,000 feet). Pileus cloud is normally very short-lived. It occurs when a vigorously rising cumuliform cloud encounters a hitherto invisible layer of moisture. Such clouds are very similar in appearance to lenticular clouds formed over mountains (see right photograph below taken over Lantau Island on 10 April 2004). Indeed they both arise through a rather similar mechanism – a layer of humid airflow forced to rise on encountering the towering cumulus (for pileus clouds) or mountains (for lenticular clouds).



冠軍照片

以下的照片從機場向東北方拍攝，捕捉到 2004 年 5 月 4 日上午 7 時 54 分左右一道冷鋒從北方移近。與該冷鋒相聯繫的牆狀雨雲帶位於照片的左面，跟照片右面的無雨區形成強烈對比。這照片是天氣觀測員周志雄先生在香港國際機場拍攝，在天文台最近舉行的職員攝影比賽中贏得冠軍（請參閱第 16 版的文章）。

The Winner's Photo

Viewing from the airport towards northeast, the photograph (right) captures the approach of a cold front from the north at around 7:54 a.m., 4 May 2004. The wall-shaped, rain-bearing clouds associated with the cold front on the left-hand side of the photo are in sharp contrast with the rain-free area to the right. The picture which was taken by Mr. C.H. Chow, a weather observer at the Hong Kong International Airport won the championship of a staff photo competition in the Observatory recently (see article on P.16).



這幅冠軍照片，顯示 2004 年 5 月 4 日與一道冷鋒相聯繫的牆狀雨雲帶正移向機場

Winning photograph of wall-shaped, rain-bearing clouds associated with a cold front approaching the airport on 4 May 2004

重要天氣

激光雷達顯示風切變的短暫和偶發性

陳柏緯

在 2004 年 8 月 28 至 30 日期間，廣東西部的一個低壓區為大嶼山帶來強風程度的偏南風，並引致香港國際機場上空出現平常罕見的擾動氣流，一共有 69 班航機報告遇到風切變，17 班報告中度至強烈湍流，11 班航機由於風切變及湍流而復飛。除了颱風襲港，這次風切變過程是自機場啓用以來在八月份出現最多航機報告的一次。

激光雷達清楚地捕捉到這些風切變事件，圖 1 為 2004 年 8 月 30 日 14:40 世界時(下午 10 時 40 分)的激光雷達多普勒風速圖像，顯示機場上空出現擾動氣流，激光雷達有助於及時為航機發出風切變警報。

吹過大嶼山的偏南強風，已知與機場的短暫及偶發性的風切變事件有密切的關係。在這次過程中，多班航機皆報告遇到空速損失伴隨空速增加的風切變。例如在 2004 年 8 月 30 日 14:41 世界時，一班在 25L 跑道起飛的航機(即從南跑道向西起飛)報告在 1,000 呎高度遇到 ± 20 海里/小時的風切變。在這報告的時間，激光雷達觀察到在航機當時位置的逆風有明顯的波動。

除了空間上有較大的變化外，沿著航機的逆風亦隨時間迅速改變。在 2004 年 8 月 30 日 14:41 世界時，激光雷達顯示在南跑道的西部盡頭先有每小時 20 海里的逆風損失，及後有每小時約 10 海里的逆風增加(圖 2 中以綠色特別顯示的區域)。僅兩分鐘後，同一位置的逆風發生次序已轉變為先有每小時約 10 海里的逆風增加，及後有每小時約 15 海里的逆風損失。

激光雷達顯示有能力捕捉到地形引起的風切變的短暫和偶發的特性。為進一步完善機場的風切變探測，天文台正致力把風切變的探測過程自動化。

Severe weather

LIDAR Revealing Transient and Sporadic Nature of Windshear

P.W. Chan

During the period 28 – 30 August 2004, a depression over western Guangdong brought strong southerly winds over Lantau Island and unusually disturbed airflow at the Hong Kong International Airport (HKIA). There were altogether 69 aircraft reports of windshear and 17 reports of moderate to severe turbulence. 11 aircraft conducted missed approaches due to the windshear and turbulence conditions. Apart from typhoon days, this is the windshear episode in August with the largest number of aircraft reports since the opening of HKIA.

These windshear events were well captured by the LIDAR. Figure 1 shows the LIDAR imagery of the Doppler velocity at 14:40 UTC (10:40 p.m.), 30 August 2004, revealing the disturbed airflow over HKIA. With the assistance of the LIDAR, timely windshear warnings were issued to the aircraft.

Strong southerly airflow over Lantau is well known for its association with transient and sporadic windshear events at HKIA. During the episode, a number of aircraft reported the encounter of windshear with both airspeed loss and gain. For instance, at 14:41 UTC on 30 August 2004, an aircraft reported windshear of ± 20 knots at 1,000 feet on departure from the 25L runway corridor (i.e. departing towards the west over the south runway). The fluctuating headwind was clearly seen on LIDAR at the time and location of the report.

Besides the relatively large spatial variation, the winds along the glide path also fluctuated rapidly with time. At 14:41 UTC on 30 August 2004, the LIDAR showed a headwind loss of 20 knots followed immediately by a headwind gain of around 10 knots over the western end of the south runway (the region highlighted in green in Figure 2). Just 2 minutes later, the headwind sequence at the same location reversed with a headwind gain of about 10 knots followed by a headwind loss of around 15 knots.

The LIDAR demonstrated its capability of capturing the transient and sporadic characteristics of terrain-induced windshear. To further improve windshear detection for HKIA, the Observatory is working to automate the windshear detection process.

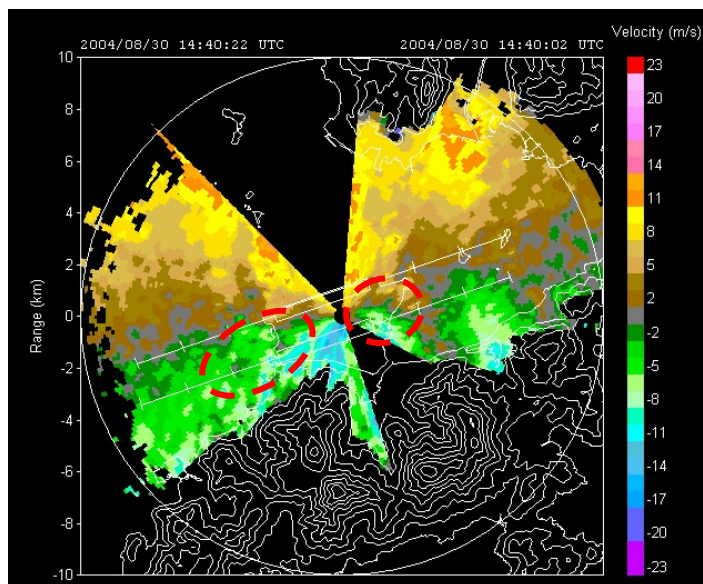


圖 1 2004 年 8 月 30 日 14:40 世界時激光雷達的多普勒風速圖像(冷/暖色代表吹向/離開雷達的風)，顯示一些小尺度的特徵，有助解釋風切變有偶發的特性(可能出現風切變的地區以紅圈表示)。

Figure 1 LIDAR imagery of the Doppler velocity at 14:40 UTC, 30 August 2004 (cool / warm colours representing wind blowing towards / away from the LIDAR). It reveals the small-scale wind features and helps explain the sporadic nature of windshear (possible windshear areas encircled in red).

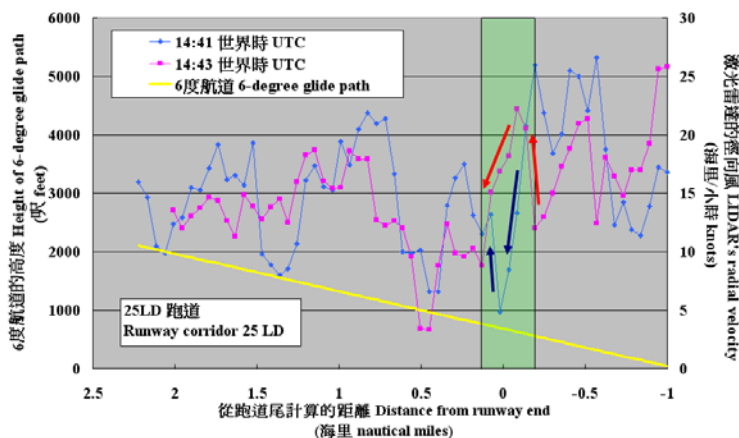


圖 2 在 2004 年 8 月 30 日 14:41 及 14:43 世界時，利用激光雷達沿著 25L 離場航道所觀察的徑向風，顯示該跑道的逆風廓線。從逆風廓線的快速變化，可見風切變頗為短暫。

Figure 2 Headwind profiles as indicated by the LIDAR observed radial velocity along the departure glide path of runway 25L at 14:41 and 14:43 UTC, 30 August 2004. The windshear is rather transient, as revealed in the rapid change of the headwind profile.

龍捲風目睹記

胡仲偉 – 航空天氣預報員

2004 年 9 月 6 日下午，我在位於機場控制塔的機場氣象所值班。在下午 5 時 40 分左右，雷達圖像顯示強雷暴區將會移近和影響機場一帶，我發出了機場的雷暴警告，之後便如往常一樣，開始籌算當晚及隨後一天的機場天氣預報，並不時留意窗外的天氣情況。對一個航空天氣預報員來說，掌握未來一天的天氣狀況及即時的天氣變化，是同樣重要的。

大約過了 15 分鐘，當我抬頭遠望時，赫然看見在我們的南方出現了一團黑影，從天上一直伸延至地面。這是甚麼？是雷雨，還是 ... 龍捲風？不是吧，龍捲風在香港平均約 3 年才出現一次，自己不是那麼「幸運」吧？

我立即聯同當值的天氣觀測員何永材走出機場氣象所的露台外再仔細觀察。何先生專責天氣觀測，對判別天氣現象有豐富的經驗。我們看到貨運停機坪上確實出現了一個旋轉的氣柱，周圍有雜物伴隨飛舞，再分析風速表、機場多普勒天氣雷達及激光雷達的資料，可以確定是龍捲風。依照國際標準，何先生立即發出特殊天氣報告，指出香港國際機場的上空出現了龍捲風，我亦即時與航空交通控制員聯絡。

我進一步分析各種天氣資料，確定是否還有其他龍捲風存在，幸好並沒有發現，而這個龍捲風約在 5 分鐘後亦消失了，緊張的時刻總算過去。

我在天文台工作了十二年，以往只在書本或電影裏見過龍捲風，今次能親眼看見它，心情十分興奮，同時令我覺得天氣觀測及預報對保障飛行安全責任重大，能夠擔當此職，我們感到自豪。

Eye-witnessing the Tornado

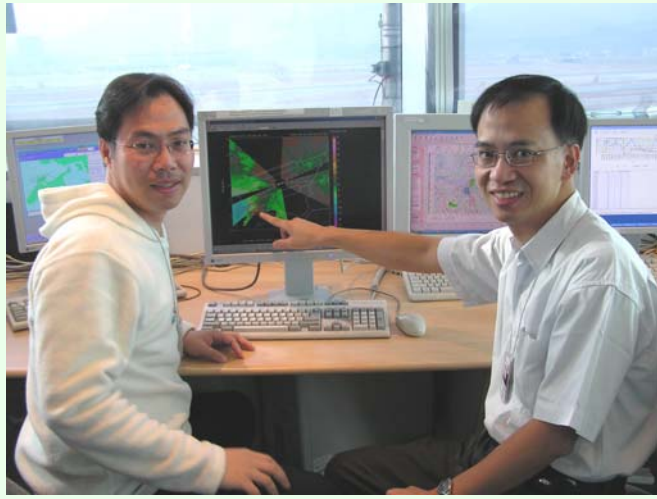
C.W. Wu – Aviation Weather Forecaster

In the afternoon of 6 September 2004, I was on duty at the Airport Meteorological Office (AMO) located at the Air Traffic Control Tower. At around 5:40 p.m., in view of the approach of intense thunderstorms towards the airport as shown in the weather radar imageries, I issued the aerodrome thunderstorm warning. Afterwards I started the regular job of preparing the aerodrome weather forecast for that night and the day after while keeping an eye on the weather situation outside at the same time. For the aviation weather forecaster, it is equally important to grasp the weather forecast for the following day as well as the changes in the current weather.

After around 15 minutes, I looked out of the windows again. To my surprise, just to our south where the AMO is located, there was a dark cloud extending to the ground. What is it? A thunderstorm, or ... a tornado? Come on, tornadoes only appear in Hong Kong once every 3 years on average. Am I so "lucky"?

I immediately went out to the AMO gantry with the duty weather observer W.C. Ho to observe the feature in more detail. Mr. Ho is specialized in weather observation and has rich experience in identifying weather phenomena. We saw that there was a rotating air column over the cargo apron with debris swirling around. After analyzing the data from the anemometers, Terminal Doppler Weather Radar and the Light Detection and Ranging System, we found that it was indeed a tornado. In accordance with international practice, Mr. Ho issued a special weather report right away on the occurrence of a tornado over the Hong Kong International Airport. I contacted the duty air traffic controller at the same time.

(continued on P.12)



(continued from P.11)

I further analyzed the various weather data to determine if there were any other tornadoes around and, fortunately, no more tornadoes were found. The earlier tornado also disappeared after around 5 minutes. The tension was eventually over.

I have been working in the Observatory for 12 years now. In the past, I only came across tornadoes in books or movies. This is the first time that I saw a tornado with my own eyes. Apart from being an exciting experience, it also let me appreciate the importance of weather observation and forecasting in the assurance of flight safety. We are proud of our job.

胡仲偉(右)及何永材參考激光雷達顯示，覆述當日目睹龍捲風的情況

Messrs C.W. Wu (right) and W.C. Ho recounted the sighting of the tornado by referring to the LIDAR display

接觸客戶

Outreach

天氣預報員粉墨登場

伍滿照是天文台其中一位航空天氣預報員，他在香港電台的鏡頭前，細述天氣預報員的挑戰與喜樂，及他過去多年來為香港國際機場服務的難忘經歷。他的訪談將會在電視紀錄片「氣象萬千(三)」中出現，這是天文台第三套片集，旨在讓市民認識各種惡劣天氣，及提高他們的防災意識。該紀錄片將安排於 2005 年上半年播出。

Filming the Weatherman

Mr. M.C. Ng, an aviation weather forecaster of the Observatory, posed in front of the camera of Radio Television Hong Kong (RTHK) to describe the challenges and joy of an aviation forecaster and his memorable experience in the past years serving the Hong Kong International Airport. The interview will appear in "Meteorological Series III" – the third series of the Observatory's TV documentary aiming at promoting public awareness and preparedness for severe weather. The program is scheduled to be broadcast in the first half of 2005.



伍滿照正接受香港電台訪問

Mr. M.C. Ng being interviewed by RTHK

航空氣象小常識問答題 (答案見 16 頁)

- 以下哪一個過程會引致熱帶氣旋減弱？
 - 熱帶氣旋進入低垂直風切變地區
 - 熱帶氣旋與鄰近的高壓區相互作用
 - 衛星雲圖顯示熱帶氣旋中心開始出現風眼
 - 熱帶氣旋登陸及進入內陸
- 與晴空湍流無關聯的天氣系統是 ...
 - 亞熱帶反氣旋。
 - 高空急流。
 - 地形波。
 - 熱泡 – 太陽照射令地面加熱，較暖的空氣上升，而較涼的空氣會下沉。
- 有利於霧形成的條件是 ...
 - 近地面出現逆溫層。
 - 風向改變。
 - 低層層雲消散。
 - 達強風程度的大陸性氣流抵達。

Quiz on aviation weather (See page 16 for answers)

- Which of the following processes lead to the weakening of a tropical cyclone (TC)?
 - TC moving into an area of low vertical windshear
 - TC interacting with an area of high pressure nearby
 - An eye starting to appear in the TC's centre as shown in the satellite imagery
 - TC moving inland after making landfall
- Clear air turbulence is not associated with ...
 - subtropical anticyclones.
 - upper-level jetstreams.
 - mountain waves.
 - thermals – solar heating of the ground makes warmer air rises whereas cooler air sinks.
- Formation of fog is favoured by ...
 - occurrence of a temperature inversion near the ground.
 - change of wind direction.
 - dissipation of low-level stratus clouds.
 - arrival of a strong, continental airstream.

4. 以下哪一個儀器不能量度能見度？

- a. 前向散射儀
- b. 後向散射儀
- c. 溫濕計
- d. 透射表

4. Which of the following equipment does not measure visibility?

- a. Forward scatter sensor
- b. Backward scatter sensor
- c. Thermo-hygrometer
- d. Transmissometer

會議及探訪

Meetings and visits

探訪中國民用航空總局空中交通管理局

香港天文台在 2004 年 10 月 16 日探訪北京的中國民用航空總局空中交通管理局。雙方就航空氣象服務多個領域，如航路天氣信息交換及應用、華南地區航空氣象信息交換、技術合作等方面作出了深入的探討及交流。雙方均表示這次交流達到了滿意的成果，對雙方往後合作起了積極的作用。

Visit to Air Traffic Management Bureau, Civil Aviation Administration of China

Hong Kong Observatory visited the Air Traffic Management Bureau, Civil Aviation Administration of China (CAAC/ATMB) in Beijing on 16 October 2004. Subjects discussed included exchange and applications of en-route weather information, exchange of aeronautical meteorological information in southern China, and technical cooperation. The meeting has achieved fruitful result, facilitating mutual cooperation in the future.



天文台台長林超英(前左二)率領天文台代表團探訪中國民用航空總局空中交通管理局，得到常務副局長劉亞軍(前右二)及他的同事熱烈歡迎

Mr. C.Y. LAM, Director of the Hong Kong Observatory (front row, second from left), leading the Observatory's delegation, was warmly greeted by Mr. LIU Yajun, Executive Deputy Director-General of CAAC/ATMB (front row, second from right), and his colleagues

民航總局空管局到訪

香港天文台台長林超英先生於二零零四年十一月歡迎中國民用航空總局空中交通管理局(空管局)氣象處郭眾先生(前排左二)率領的代表團訪問天文台。該代表團考察香港國際機場的風切變及湍流警報服務。

Visit by CAAC/ATMB

Mr. C.Y. Lam, Director of the Hong Kong Observatory (middle, front row) welcomed a delegation from Air Traffic Management Bureau, Civil Aviation Administration of China, led by Mr. Guo Zhong (second from left, front row) of the Meteorological Division. The delegation in November 2004 visited the Observatory to study the windshear and turbulence alerting services at the Hong Kong International Airport.



為世界各國提供航空氣象培訓

康志遠

在 2004 年 11 月，天文台在世界氣象組織的「自願合作計劃」下，為十位分別來自孟加拉、汶萊、中國、伊朗、老撾、立陶宛、緬甸、烏拉圭、瓦努阿圖及津巴布韋的氣象人員舉辦了航空氣象服務培訓課程。這個為期一週的課程包括航空天氣預報、觀測及提供服務的方法。參加者學成回國後，將會在航空氣象服務工作上擔當領導角色。

世界氣象組織的「自願合作計劃」在 1967 年成立，旨在為成員國在儀器、專業服務、培訓及教育等方面提供協助，符合他們的需要。天文台認同世界氣象組織的「共同合作精神」，過去數年為「自願合作計劃」作出貢獻，向成員國提供了不同種類的課程。

Aviation Meteorology Training for the World

C.Y. Hong

In November 2004, the Observatory organized a training course on aviation meteorological services to ten meteorologists from Bangladesh, Brunei, China, Iran, Laos, Lithuania, Myanmar, Uruguay, Vanuatu and Zimbabwe under the Voluntary Cooperation Programme (VCP) of the World Meteorological Organization (WMO). The 1-week course covered aviation weather forecasting, observation and service delivery. These meteorologists are expected to take leading roles in the provision of aviation weather services in their countries after the training.

(continued on P.14)



(continued from P.13)

World Meteorological Organization (WMO) established the Voluntary Cooperation Programme (VCP) in 1967 to provide assistance to Member countries in the form of equipment, expert services, training and education to meet their needs. Sharing the “spirit of working together” of WMO, the Observatory had contributed to the VCP in the last few years by offering a variety of training courses to Member countries.

呂永康先生為學員介紹天文台的「航空氣象資料發放系統」網頁
Mr. W.H. Lui introduced the participants to the Observatory's web-based Aviation Meteorological Information Dissemination System (AMIDS).

在亞太區推廣航空氣象

天文台的岑智明先生在 2004 年 8 月 23 至 25 日期間參加國際民用航空組織的亞太區航空計劃及實施區域組第十五次會議 (APANPIRG)，並在會上報告月前舉行的通訊/導航/監察及氣象 (CNS/MET) 小組會議上有關氣象的討論所得到的成果。這是岑先生第一次以 CNS/MET 小組副主席的身份在 APANPIRG 會議上報告航空氣象方面的事項。會議通過了 CNS/MET 小組所制訂的所有 17 項與航空氣象有關的結論及決定草案，包括促進世界區域預報系統的進一步發展，業務氣象資料的交換，及專為國際航空而設的火山灰及熱帶氣旋警告系統。



Promoting Aviation Meteorology in the Asia/Pacific Region

Mr. C.M. Shun of the Hong Kong Observatory attended the 15th Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) of the International Civil Aviation Organization (ICAO) during 23-25 August 2004. He presented the outcomes of the meteorological discussions obtained in an earlier meeting of the Communications/Navigation/Surveillance and Meteorology (CNS/MET) Sub-group of APANPIRG. This is the first time Mr. Shun, as Vice-chairman of the CNS/MET Sub-group, reported on aviation meteorological matters at APANPIRG. All 17 draft conclusions and decisions formulated by the CNS/MET Sub-group related to aviation meteorology were endorsed by the meeting. These conclusions and decisions seek further developments in the World Area Forecast System, exchange of operational meteorological information, and the volcanic ash and tropical cyclone warning systems in support of international aviation.

岑智明先生(左起第一位)在第 15 屆 APANPIRG 會議上報告區內航空氣象的進展

Mr. C.M. Shun (first from the left) presenting progress with the aviation meteorological service in the region at the 15th Meeting of APANPIRG

人與事

「綠色」司機

研究主任傅可任在開發航空預報系統之餘，嘗試架駛天文台第一部太陽能車，並展現笑容，充滿信心，備戰參加 2005 年 1 月中由地球之友舉辦的太陽能車比賽。天文台在使用再生能源方面歷史悠久 — 在機場附近及本港其他地區現時有多個自動氣象站由太陽能及風能操作，包括山頂和偏遠地方。

“Green” Driver

Addy H.Y. Fu, a research officer working on aviation forecast systems, smiled confidently as he test-drove the first solar cart of the Observatory, in preparation for the solar cart race to be organized by the Friends of the Earth in mid-January 2005. The Observatory has a long history of using renewable energy — solar and wind-powered automatic weather stations are currently operated around the airport and in many other places of the territory, including mountain tops and remote sites.

Staff matters



傅可任正駕駛天文台第一部太陽能車
Addy Fu driving the Observatory's first solar cart

幕後英雄

黃揚子

天文台由 5 位雷達機械師及 1 位科學助理所組成的小組，負責安裝及維修香港國際機場內和鄰近地區的氣象觀測儀器，包括較為常規的風速表，以至先進的激光雷達系統(有關激光雷達的文章請參閱第 4 版)。他們全力以赴，務求完成使命，並隨時候命進行緊急維修。

爲了確保航空氣象儀器不斷地以最佳水平運作，各隊員除了學習維修儀器的最新知識外，亦自行發展了一些新方法，例如製作了一個特別的測試裝置，檢查氣流剖析儀的運作狀況，以及建立了遙距分析和復修設施，方便迅速地修理好跑道上損壞的組件。



The Unsung Heroes

Y.T. Wong

A team of 5 Radar Specialist Mechanics and 1 Scientific Assistant takes care of the installation and maintenance of all the weather observing equipment inside and around the Hong Kong International Airport, ranging from the more conventional anemometers to the state-of-the-art Light Detection and Ranging (LIDAR) system (see the article on the LIDAR on p.4). They are devoted to their mission and are on-call round-the-clock for emergency repair.

Committed to keeping the aviation weather equipment always operating at their highest standard, the team members not only learn the latest techniques to maintain the equipment, but also develop some new methods by themselves. Examples include the construction of a special test device to check the health of the wind profiler and remote diagnostic and recovery facility for prompt repair of failed components on the runways.

航空氣象儀器維修組拍攝於機場內的氣象觀測園

The aviation weather equipment maintenance team photographed inside the meteorological enclosure at the airport

工程師培訓

黃揚子

呂世豪是機電工程署的見習工程師，在 2004 年 8 月尾，他加入天文台的機場氣象儀器維修組進行爲期 8 個星期的在職培訓。

呂先生負責發展一個以微處理器爲基礎的系統，監察天文台在沙螺灣的氣流剖析儀站的電力情況。該站並無人操作，電力監察系統會不斷感應市電的供應及站內緊急發電機的運作，萬一電力出現故障，系統會即時通知駐守機場的維修人員，讓他們及早作出安排。

當談及他的工作課題，呂先生露出誠懇的笑容：「我很享受這項工作，它讓我把課堂所學應用在實際環境上。」



Training of Engineer

Y.T. Wong

Mr. Lui Sai-ho, Edmond, an engineering graduate from the Electrical and Mechanical Services Department (EMSD), joined the Observatory's aviation weather equipment maintenance team in late August 2004 for an 8-week training attachment.

Edmond was tasked to develop a microprocessor-based system to monitor the power condition of the Observatory's unmanned wind profiler station at Sha Lo Wan. This device continuously senses the status of electricity supply and emergency generator of the station and provides early warning to the maintenance staff at the airport in case there is a power failure.

Wearing an earnest smile, Edmond talked about his project. "I enjoy this project. It is a real chance for me to put what I have learnt in the classroom into application."

呂世豪在天文台的機場氣象所調較無線電天線，接收氣流剖析儀站的訊號

Edmond in action at the Observatory's Airport Meteorological Office, adjusting the radio antenna for receiving signals from the wind profiler station

攝影比賽

周志雄先生接受天文台台長林超英先生頒發的攝影比賽冠軍獎狀。周先生是香港國際機場的天氣觀測員，他的照片捕捉到一次冷鋒移近機場的情況（請參閱第 10 頁的文章）。

Photo Competition

Mr. C.H. Chow (right in the photo), a weather observer at the Hong Kong International Airport, received the championship certificate of the Observatory's photo competition from Mr. C.Y. Lam, Director of the Hong Kong Observatory. His photo captured the approach of a cold front to the airport (see the article on P.10).



聖誕獎品

胡家俊(下圖右)接受天文台台長林超英先生頒發的天文台電子賀卡設計比賽冠軍獎，這對於一位入職天文台僅兩個月的同事來說，相信是十分難忘的經驗。胡先生是一位研究助理，現時為香港國際機場開發探測風切變的運算程序和軟件。

讓我們借用他以下右面的冠軍作品，恭祝大家在 2005 年生活愉快、萬事如意！



Christmas Prize

Mr. K.C. Wu (right in the photo on the left below) was presented with the champion prize by Mr. C.Y. Lam, Director of the Hong Kong Observatory, for winning the electronic greetings card design competition of the Observatory. This should be a very memorable experience for a colleague who has joined the Observatory for 2 months only. Employed as a Research Assistant, Mr. Wu is currently working on algorithm and software development for windshear detection at the Hong Kong International Airport.

Let us use his champion work below to wish you a happy and prosperous 2005!



電話及傳真號碼

Telephone and Fax Numbers

查詢飛行文件 Enquiry on flight documents	(852) 2910 6922	
機場氣象所主管 Officer-in-charge AMO	(852) 2910 6300	(852) 2922 5805
機場氣象所當值預報員 Duty Forecaster AMO	(852) 2910 6920	(852) 2922 5806
傳真 Fax	(852) 2910 0080	
打電話問天氣 Dial-a-Weather	(852) 187 8200 (廣東話 Cantonese)	
	(852) 187 8202 (普通話 Putonghua)	
	(852) 187 8066 (英文 English)	

查詢資料電話系統 Telephone Information Enquiry System	(852) 2926 1133
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香港天文台網頁

Hong Kong Observatory Home Page

<http://www.weather.gov.hk/>

<http://www.hko.gov.hk/>

航空天氣服務網頁

Web Page for Aviation Weather Services

<http://www.weather.gov.hk/aviation>

<http://www.hko.gov.hk/aviation>

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航空氣象小常識問題答案

Answers to quiz on aviation weather

1. (d) 2. (a) 3. (a) 4. (c)