

3.2 颱風蓮花(1510)：二零一五年七月二日至十日

蓮花是香港天文台在二零一五年第二個需要發出熱帶氣旋警告信號的熱帶氣旋，亦是二零一五年唯一需要發出八號烈風或暴風信號的熱帶氣旋。

熱帶低氣壓蓮花於七月二日下午在馬尼拉以東約830公里的北太平洋西部形成，大致向偏西方向移動，翌日上午增強為熱帶風暴。七月四日蓮花轉向西北方向移向呂宋北部，並發展為強烈熱帶風暴。蓮花於七月五日橫過呂宋北部並進入南海，翌日減弱為熱帶風暴。由於引導氣流較弱，蓮花於七月六日至七日緩慢地向偏北方向漂移，並再次增強為強烈熱帶風暴。七月八日下午蓮花開始採取較為偏西的路徑逐漸靠近廣東東部沿岸，當晚增強為颱風，翌日上午達到其最高強度，中心附近最高持續風速估計為每小時140公里。蓮花於正午時分在廣東省陸豐市附近登陸，下午繼續採取偏西路徑橫越廣東沿岸地區及移向珠江口。受北面較乾燥的空氣影響，蓮花迅速減弱為熱帶低氣壓。最後於七月十日早上在廣東西部減弱為一個低壓區。

根據報章報導，蓮花吹襲廣東東部期間，最少有70萬人受災，6 700多間房屋受損，海陸空交通癱瘓，多個地區停電。

由於預料蓮花會轉向偏西的路徑靠近廣東東部沿岸，香港天文台於七月八日上午7時40分發出一號戒備信號，當時蓮花位於香港以東約480公里。隨著蓮花繼續移近廣東沿岸，天文台於七月九日上午8時40分發出三號強風信號，當時蓮花位於香港之東北偏東約260公里。下午本港風力普遍增強，多處錄得強風，高地風力間中達烈風程度。

由於預料蓮花會向西至西南偏西方向移動，在傍晚非常接近香港，天文台在七月九日下午4時40分發出八號西北烈風或暴風信號，當時蓮花集結在香港之東北約110公里。其後，蓮花迅速減弱，與蓮花相關的環流及烈風範圍亦顯著縮小。蓮花在下午9時左右最接近香港，在天文台總部以北約50公里附近掠過。隨著蓮花逐漸遠離及減弱，本港普遍受烈風影響的威脅解除，天文台在下午10時10分改發三號強風信號。其後蓮花進一步減弱為一個低壓區，天文台在七月十日上午5時50分取消所有熱帶氣旋警告信號。

蓮花吹襲香港期間，橫瀾島錄得最高潮位(海圖基準面以上)及最大風暴潮(天文潮高度以上)分別為 2.37 米及 0.48 米。各站錄得的最低瞬時海平面氣壓如下：

站	最低瞬時海平面氣壓 (百帕斯卡)	日期/月份	時間
香港天文台總部	993.8	9/7	下午 4 時 21 分
長洲	993.8	9/7	下午 4 時 40 分
香港國際機場	994.9	9/7	下午 4 時 36 分
京士柏	993.5	9/7	下午 4 時 32 分
流浮山	994.1	9/7	下午 5 時 05 分
橫瀾島	993.1	9/7	下午 3 時 59 分

七月八日本港短暫時間有陽光。與蓮花及其殘餘相關的雨帶於七月九日下午至七月十日早上影響本港，各區普遍錄得超過 20 毫米雨量，港島、大嶼山、長洲及南丫島更錄得超過 40 毫米雨量。

蓮花吹襲香港期間並沒有造成嚴重破壞，本港有幾宗塌樹報告。香港國際機場有520班航班需要重新編配。

表3.2.1 - 3.2.4 分別是蓮花影響香港期間各站錄得的最高風速、持續風力達到強風及烈風程度的時段、香港的日雨量及最高潮位資料。圖3.2.1 - 3.2.5 分別為蓮花的路徑圖、本港的雨量分佈圖、飛機觀測、蓮花的衛星及雷達圖像。

3.2 Typhoon Linfa (1510): 2 – 10 July 2015

Linfa was the second tropical cyclone necessitating the issuance of tropical cyclone warning signal by the Hong Kong Observatory in 2015. It was also the only tropical cyclone requiring the issuance of the Gale or Storm Signal No. 8 in the year.

Linfa formed as a tropical depression over the western North Pacific about 830 km east of Manila on the afternoon of 2 July. It moved generally westwards and intensified into a tropical storm the next morning. Moving northwestwards, Linfa headed towards the northern part of Luzon and developed into a severe tropical storm on 4 July. Linfa moved across the northern part of Luzon on 5 July and entered the South China Sea. It weakened into a tropical storm the next day. With a weaker steering flow, Linfa slowly drifted northwards on 6 and 7 July and re-intensified into a severe tropical storm. It started to take on a more westerly track and edged closer to the coast of eastern Guangdong on the afternoon of 8 July. Linfa intensified into a typhoon that night, reaching its peak intensity the next morning with an estimated sustained wind of 140 km/h near its centre. Linfa made landfall near Lufeng in Guangdong around noon and continued to track westwards across the coastal areas of Guangdong towards the Pearl River Estuary in the afternoon. Affected by relatively dry air from the north, Linfa weakened rapidly into a tropical depression. It finally degenerated into an area of low pressure on the morning of 10 July over western Guangdong.

According to press reports, at least 700 000 people were affected and 6 700 houses were damaged in eastern Guangdong during the passage of Linfa. Transportation services were suspended and there were power outage in many places.

As Linfa was expected to turn west towards the coastal areas of eastern Guangdong, the Standby Signal No. 1 was issued at 7:40 a.m. on 8 July when Linfa was about 480 km east of Hong Kong. As Linfa continued to move closer to the coast of Guangdong, the Strong Wind Signal No. 3 was issued at 8:40 am on 9 July when Linfa was about 260 km east-northeast of the territory. Wind strengthened generally over Hong Kong in the afternoon, with strong winds recorded over many places and winds reaching gale force occasionally on high ground.

As Linfa was expected to turn west or west-southwestward, getting very close to the territory in the evening, the No. 8 Northwest Gale or Storm Signal was issued at 4:40 p.m. on 9 July when Linfa was about 110 km northeast of the territory. Subsequently, Linfa weakened rapidly and its circulation and gale extent also shrunk significantly. Linfa was closest to Hong Kong at around 9 p.m. on 9 July when it was about 50 km north of the Hong Kong Observatory Headquarters. With Linfa gradually moving away from Hong Kong and weakening, the threat of gales subsided. The Strong Wind Signal No. 3 was issued at 10:10 p.m. on 9 July. As Linfa degenerated further into an area of low pressure, all tropical cyclone warning signals were cancelled at 5:50 a.m. on 10 July.

Under the influence of Linfa, a maximum sea level (above chart datum) of 2.37 m and a maximum storm surge of 0.48 m (above astronomical tide) were recorded at Waglan Island. The lowest instantaneous mean sea-level pressures recorded at some selected stations are as follows:-

Station	Lowest instantaneous mean sea-level pressure (hPa)	Date/Month	Time
Hong Kong Observatory Headquarters	993.8	9/7	4:21 p.m.
Cheung Chau	993.8	9/7	4:40 p.m.
Hong Kong International Airport	994.9	9/7	4:36 p.m.
King's Park	993.5	9/7	4:32 p.m.
Lau Fau Shan	994.1	9/7	5:05 p.m.
Waglan Island	993.1	9/7	3:59 p.m.

There were sunny intervals in Hong Kong on 8 July. Rainbands associated with Linfa and its remnant affected the territory from the afternoon of 9 July to the morning of 10 July. More than 20 millimetres of rainfall were generally recorded, with rainfall amounts exceeding 40 millimetres over Hong Kong Island, Lantau Island, Cheung Chau and Lamma Island.

Linfa did not cause any significant damage in Hong Kong and there were a few reports of fallen trees. There were 520 flights re-scheduled at the Hong Kong International Airport.

Information on the maximum wind, period of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Linfa is given in Tables 3.2.1 - 3.2.4 respectively. Figures 3.2.1 - 3.2.5 show respectively the track of Linfa, the rainfall distribution for Hong Kong, aircraft observation, satellite imageries and radar imageries of Linfa.

表 3.2.1 在蓮花影響下，本港各站在熱帶氣旋警告信號生效時所錄得的最高陣風、最高每小時平均風速及風向

Table 3.2.1 Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Linfa were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高陣風 Maximum Gust				最高每小時平均風速 Maximum Hourly Mean Wind					
		風向 Direction		風速 (公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time	風向 Direction		風速 (公里/時) Speed (km/h)	日期/月份 Date/Month	時間 Time
黃麻角(赤柱)	Bluff Head (Stanley)	東南偏東	ESE	58	10/7	05:02	東	E	22	10/7	05:00
中環碼頭	Central Pier	西	W	54	9/7	17:18	西	W	31	9/7	16:00
長洲	Cheung Chau	西北偏北	NNW	63	9/7	15:41	西北	NW	38	9/7	16:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	58	10/7	05:38	西北偏西	WNW	30	9/7	16:00
青洲	Green Island	西北偏北	NNW	70	9/7	15:26	西北偏北	NNW	49	9/7	16:00
香港國際機場	Hong Kong International Airport	西北偏北	NNW	59	9/7	16:22	西北偏北	NNW	45	9/7	16:00
啟德	Kai Tak	東南偏東	ESE	58	10/7	05:33	西北偏西	WNW	30	9/7	16:00
京士柏	King's Park	東	E	43	10/7	05:50	西北	NW	14	9/7	17:00
流浮山	Lau Fau Shan	西北	NW	59	9/7	15:53	西北	NW	40	9/7	15:00
昂坪	Ngong Ping	東南偏東	ESE	75	10/7	01:15	東	E	49	10/7	04:00
北角	North Point	東	E	62	10/7	05:06	西南偏西	WSW	25	9/7	20:00
坪洲	Peng Chau	西北偏西	WNW	65	9/7	19:09	西北偏西	WNW	40	9/7	15:00
平洲	Ping Chau	西	W	41	9/7	18:44	西	W	22	9/7	19:00
西貢	Sai Kung	西北偏北	NNW	59	9/7	14:19	東	E	31	10/7	05:00
沙洲	Sha Chau	西北偏北	NNW	83	9/7	16:13	西北偏北	NNW	45	9/7	17:00
沙螺灣	Sha Lo Wan	東南偏東	ESE	43	10/7	05:36	西北偏西	WNW	19	9/7	20:00
沙田	Sha Tin	東北偏東	ENE	51	10/7	04:57	東北偏東	ENE	14	10/7	05:00
		東北	NE	51	10/7	05:29					
石崗	Shek Kong	東	E	59	10/7	05:45	東	E	22	10/7	05:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	58	10/7	05:11	西	W	30	9/7	14:00
打鼓嶺	Ta Kwu Ling	東	E	47	10/7	03:57	東	E	16	10/7	05:00
大美督	Tai Mei Tuk	東	E	79	10/7	03:41	東	E	47	10/7	04:00
大帽山	Tai Mo Shan	東南偏東	ESE	92	10/7	05:21	東南偏東	ESE	62	10/7	02:00
大埔滘	Tai Po Kau	西北	NW	52	9/7	15:06	東	E	31	10/7	05:00
塔門	Tap Mun	西北偏西	WNW	68	9/7	14:40	西北偏西	WNW	38	9/7	17:00
		西北偏西	WNW	38	9/7	18:00					
大老山	Tate's Cairn	東南偏東	ESE	101	10/7	05:13	西北偏北	NNW	52	9/7	16:00
將軍澳	Tseung Kwan O	東南偏東	ESE	31	10/7	04:19	東北偏東	ENE	12	8/7	14:00
		東南偏東	ESE	31	10/7	04:27	東北	NE	12	8/7	16:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	西北偏西	WNW	40	9/7	17:29	西北	NW	20	9/7	15:00
屯門政府合署	Tuen Mun Government Offices	西北偏西	WNW	52	9/7	15:23	西北	NW	19	9/7	16:00
橫瀾島	Waglan Island	東南偏東	ESE	70	10/7	04:44	東北偏東	ENE	38	10/7	05:00
		東南偏東	ESE	70	10/7	04:45					
		東南偏東	ESE	70	10/7	04:48					
		東	E	70	10/7	05:41					
濕地公園	Wetland Park	西北	NW	40	9/7	16:12	西北偏北	NNW	20	9/7	15:00
黃竹坑	Wong Chuk Hang	東	E	52	10/7	05:49	東	E	19	10/7	04:00

表 3.2.2 在蓮花影響下，熱帶氣旋警告信號系統的八個參考測風站在熱帶氣旋警告信號生效時錄得持續風力達到強風及烈風程度的時段

Table 3.2.2 Periods during which sustained strong and gale force winds were attained at the eight reference anemometers in the tropical cyclone warning system when the tropical cyclone warning signals for Linfa were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風*時間 Start time strong wind speed* was reached		最後達到強風*時間 End time strong wind speed* was reached	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	9/7	15:42	9/7	15:47
香港國際機場	Hong Kong International Airport	9/7	14:10	9/7	18:40
流浮山	Lau Fau Shan	9/7	14:34	9/7	16:02

所有參考測風站的持續風力未達到烈風#程度。

The sustained wind speed did not attain gale# at all reference anemometers.

啟德、西貢、沙田、打鼓嶺及青衣島蜆殼油庫的持續風力未達到強風程度。

The sustained wind speed did not attain strong force at Kai Tak, Sai Kung, Sha Tin, Ta Kwu Ling and Tsing Yi Shell Oil Depot.

* 十分鐘平均風速達每小時 41-62 公里

* 10-minute mean wind speed of 41-62 km/h

十分鐘平均風速達每小時 63-87 公里

10-minute mean wind speed of 63-87 km/h

註： 本表列出持續風力最初及最後達到強風程度的時間。其間，風力可能高於或低於指定的風力。

Note: The table gives the first and last time when strong winds were recorded. Note that the winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.2.3 蓮花影響香港期間，香港天文台總部及其他各站所錄得的日雨量
Table 3.2.3 Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Linfa

站 (參閱圖 3.2.2) Station (See Fig. 3.2.2)			七月八日 8 Jul	七月九日 9 Jul	七月十日 10 Jul	總雨量 (毫米) Total (mm)
香港天文台 Hong Kong Observatory			0.0	2.0	24.3	26.3
香港國際機場 Hong Kong International Airport (HKA)			0.0	1.7	23.9	25.6
長洲 Cheung Chau (CCH)			0.0	0.5	[31.5]	[32.0]
H23	香港仔	Aberdeen	0.0	2.0	41.5	43.5
N05	粉嶺	Fanling	0.0	4.5	6.0	10.5
N13	糧船灣	High Island	0.0	4.0	26.0	30.0
K04	佐敦谷	Jordan Valley	0.0	4.5	28.5	33.0
N06	葵涌	Kwai Chung	0.0	3.0	17.5	20.5
H12	半山區	Mid Levels	0.0	3.5	33.5	37.0
N09	沙田	Sha Tin	0.0	2.5	13.5	16.0
H19	筲箕灣	Shau Kei Wan	0.0	0.0	25.0	25.0
SEK	石崗	Shek Kong	0.0	7.5	[19.5]	[27.0]
K06	蘇屋邨	So Uk Estate	0.0	2.5	20.0	22.5
R31	大美督	Tai Mei Tuk	0.0	2.5	21.0	23.5
R21	踏石角	Tap Shek Kok	0.0	2.0	15.0	17.0
N17	東涌	Tung Chung	0.0	9.0	44.0	53.0
R27	元朗	Yuen Long	0.0	6.5	10.0	16.5

註：[] 基於不完整的每小時雨量數據。

Note: [] based on incomplete hourly data.

表 3.2.4 蓮花影響香港期間，香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.2.4 Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Linfa

站 (參閱圖 1.1) Station (See Fig. 1.1)		最高潮位 (海圖基準面以上) Maximum sea level (above chart datum)			最大風暴潮 (天文潮高度以上) Maximum storm surge (above astronomical tide)		
		高度(米) Height (m)	日期/月份 Date/Month	時間 Time	高度(米) Height (m)	日期/月份 Date/Month	時間 Time
鰂魚涌	Quarry Bay	2.22	8/7	14:27	0.42	9/7	03:32
大廟灣	Tai Miu Wan	2.16	8/7	14:16	0.41	8/7	14:16
大埔滘	Tai Po Kau	2.29	10/7	05:03	0.45	8/7	20:47
尖鼻咀	Tsim Bei Tsui	2.33	8/7	14:11	0.31	9/7	05:38
橫瀾島	Waglan Island	2.37	10/7	04:50	0.48	9/7	03:33

石壁 - 沒有資料 Shek Pik - data not available

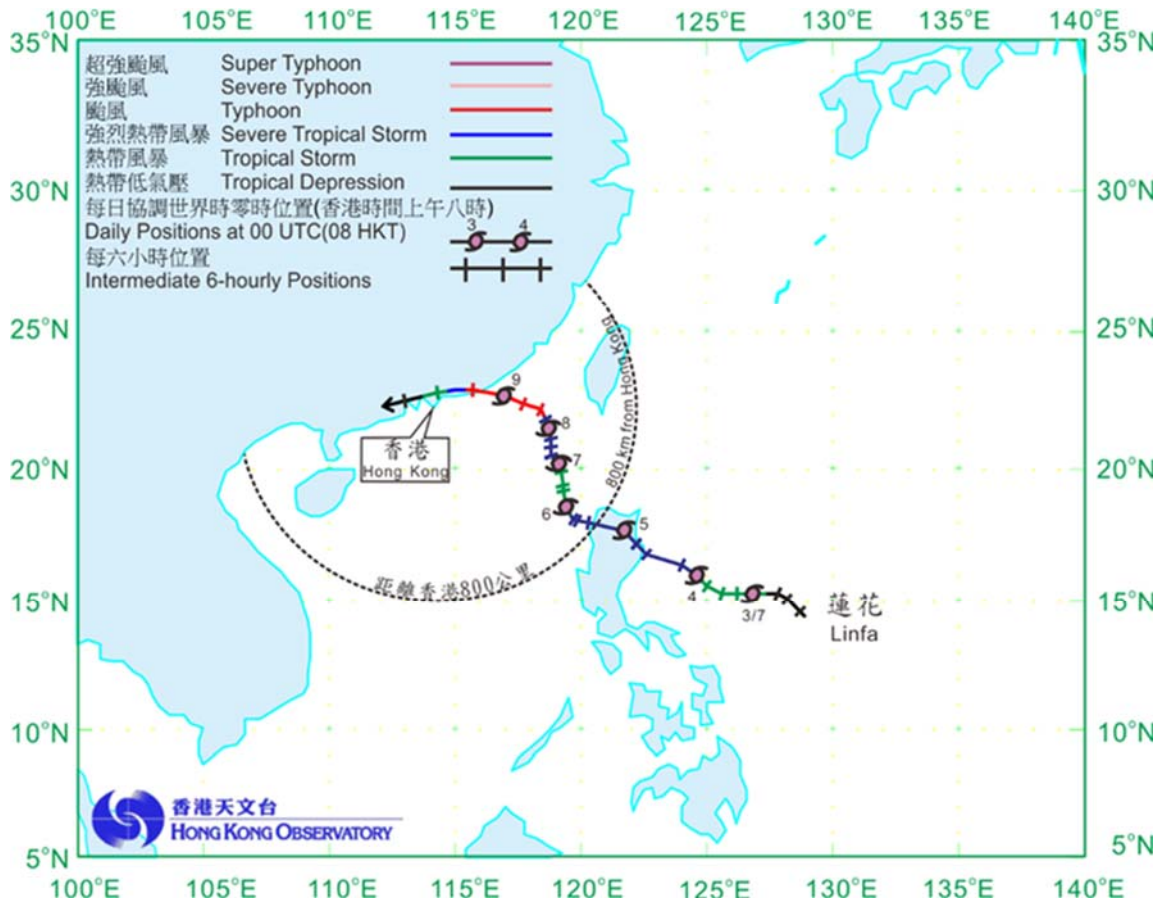


圖 3.2.1a 二零一五年七月二日至十日蓮花 (1510) 的路徑圖。
 Figure 3.2.1a Track of Linfa (1510): 2 – 10 July 2015.

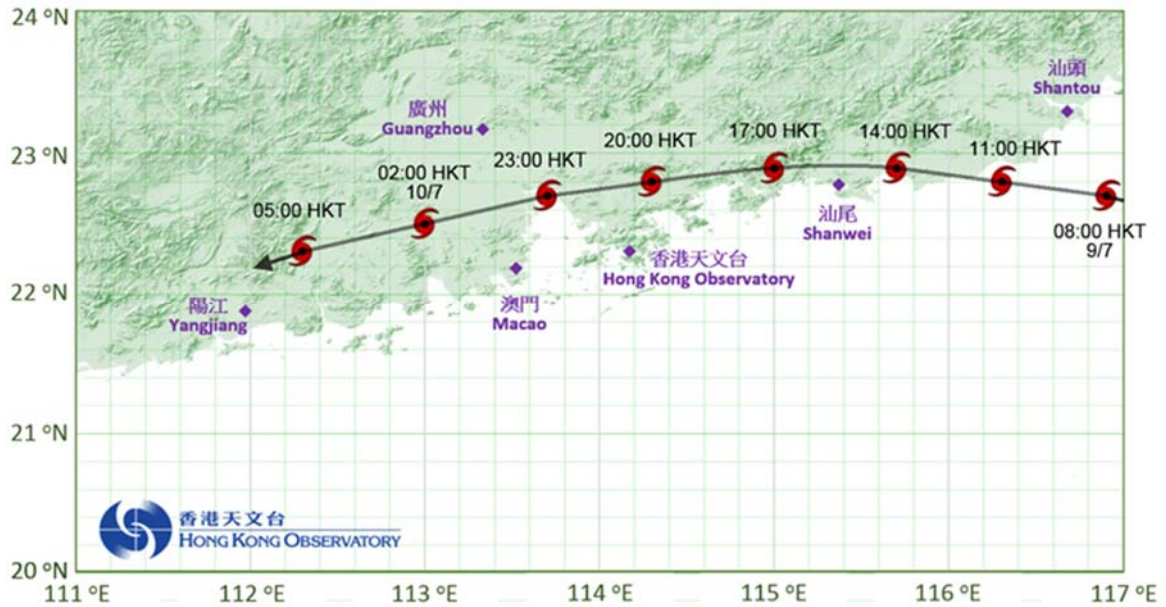


圖 3.2.1b 蓮花 (1510) 接近香港時的路徑圖。
 Figure 3.2.1b Track of Linfa (1510) near Hong Kong.

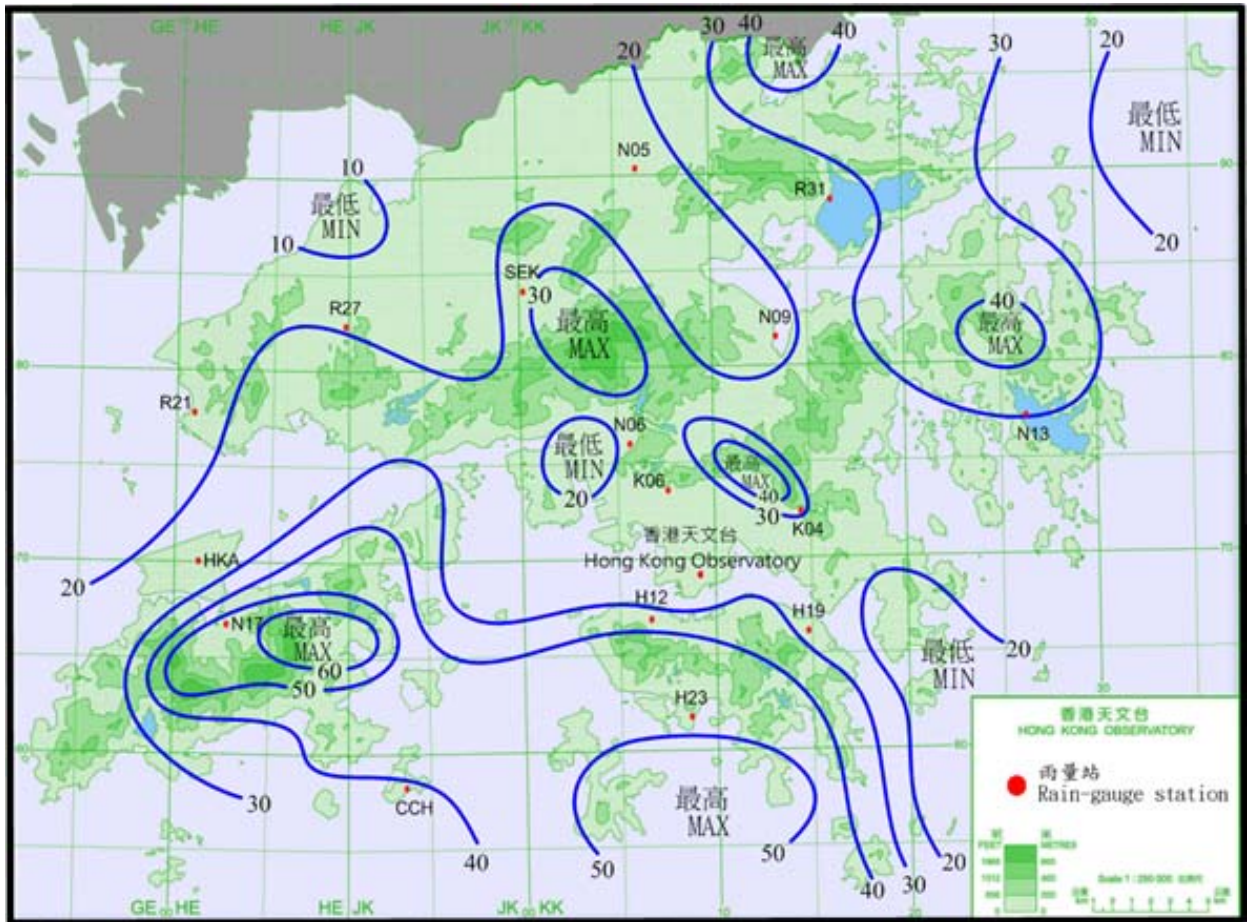


圖 3.2.2 二零一五年七月八日至十日的雨量分佈(等雨量線單位為毫米)。
 Figure 3.2.2 Rainfall distribution on 8 – 10 July 2015 (isohyets are in millimetres).

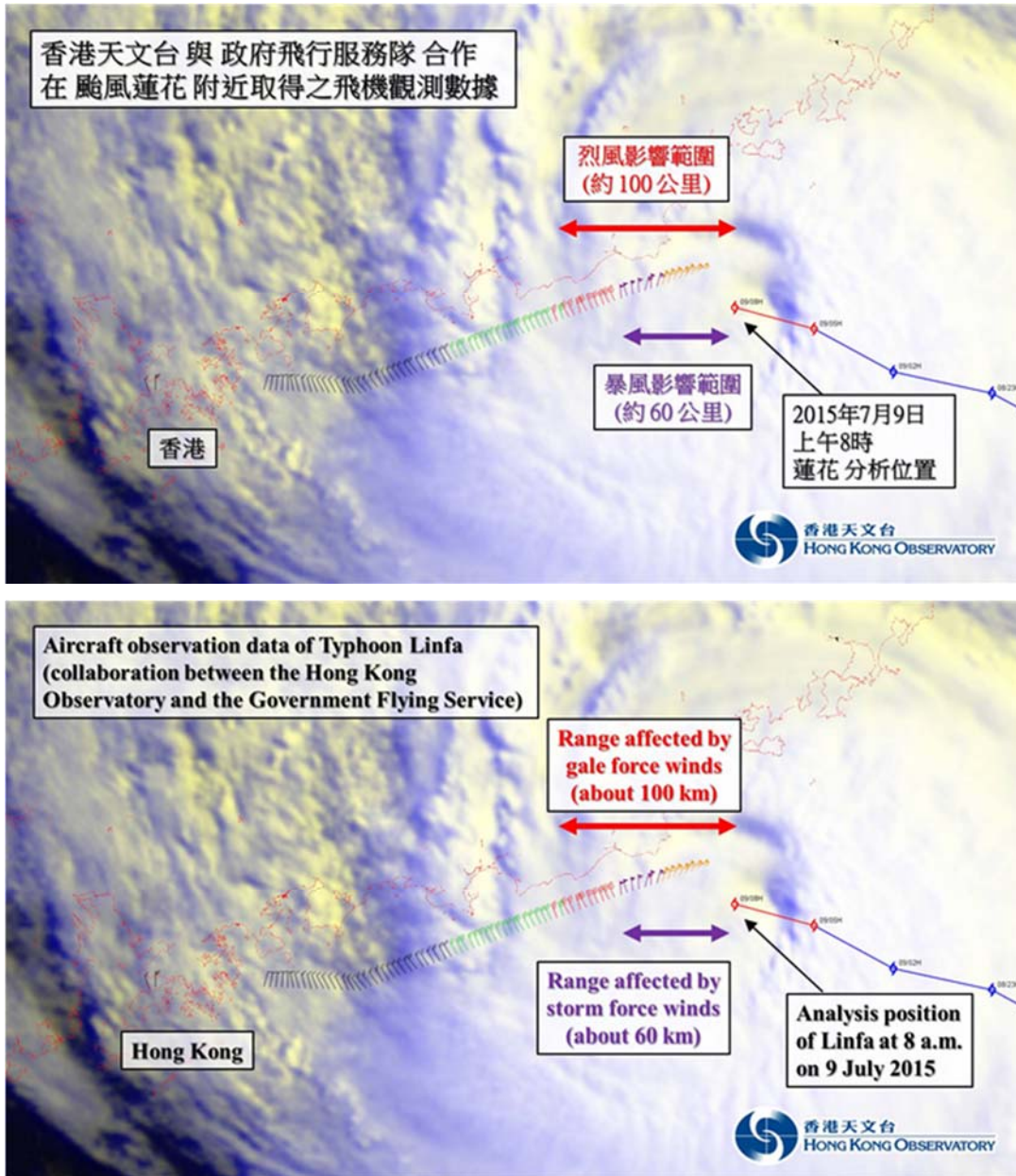


圖 3.2.3 香港天文台與飛行服務隊合作在七月九日上午7時至9時取得之飛機觀測數據，顯示颱風蓮花風眼附近利用飛機數據估算的接近海平面風力達颶風程度，而距離其中心 100 公里附近的風力達烈風程度。

Figure 3.2.3 Aircraft observation data of Typhoon Linfa under collaboration between the Hong Kong Observatory and the Government Flying Service from 7 to 9 a.m. on 9 July, showing that winds near sea surface estimated from the flight data reaching hurricane force winds near centre of Linfa, and gales extending about 100 km from its centre.

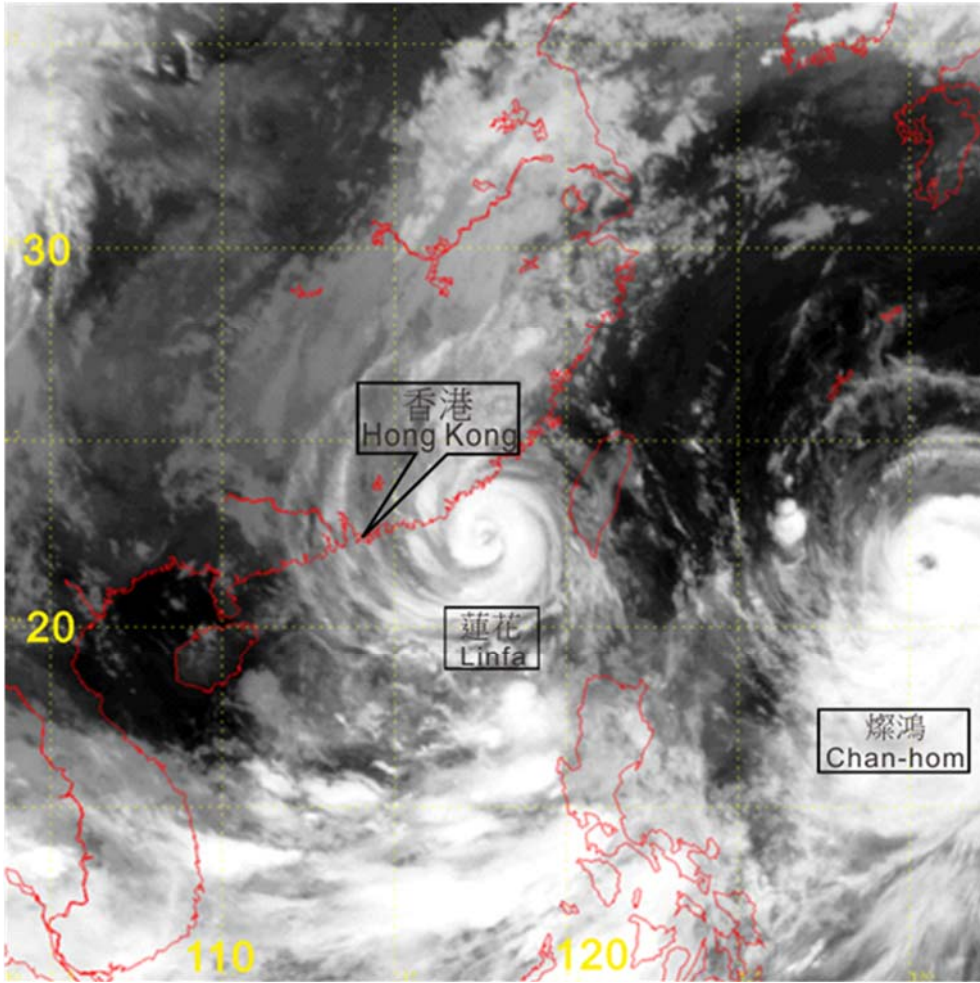


圖 3.2.4 二零一五年七月九日上午 1 時 30 分左右的紅外線衛星圖片，當時蓮花達到其最高強度，中心附近最高持續風速估計為每小時 140 公里。

Figure 3.2.4 Infra-red satellite imagery around 1:30 a.m. on 9 July 2015 when Linfa was at its peak intensity with estimated maximum sustained winds of 140 km/h near its centre

[此衛星圖像接收自日本氣象廳的向日葵 8 號衛星。]

[The satellite imagery was originally captured by the Himawari-8 (H-8) of Japan Meteorological Agency (JMA).]

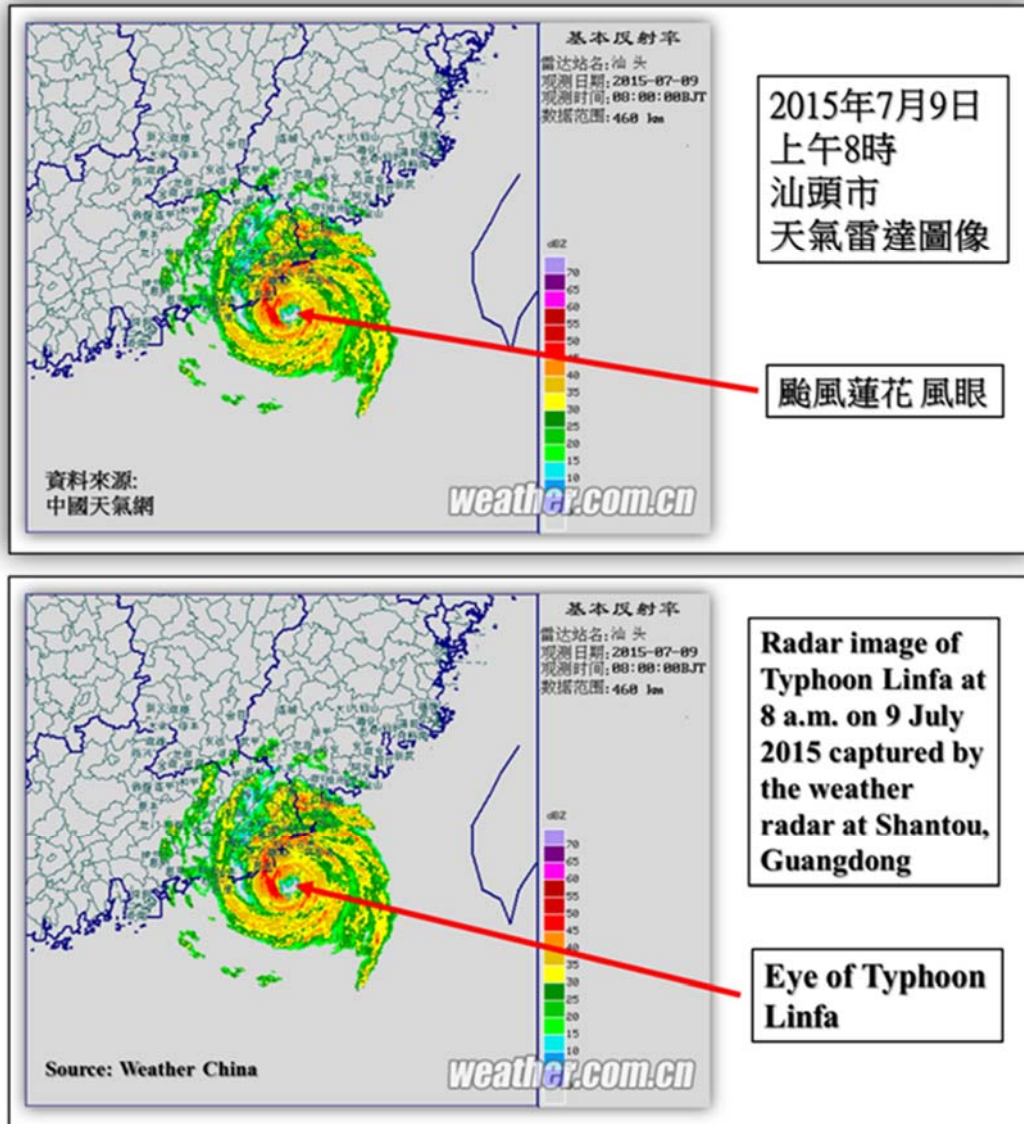


圖 3.2.5a 二零一五年七月九日上午 8 時廣東省汕頭市天氣雷達圖像，當時蓮花中心附近最高持續風速估計為每小時 140 公里，其風眼在雷達上清晰可見。

Figure 3.2.5a Radar image of Typhoon Linfa at 8 a.m. on 9 July 2015 captured by the weather radar at Shantou, Guangdong. The estimated sustained wind of Linfa at that time was 140 km/hr and its eye was clearly discernible on radar.

資料來源：中國天氣網
Source: Weather China

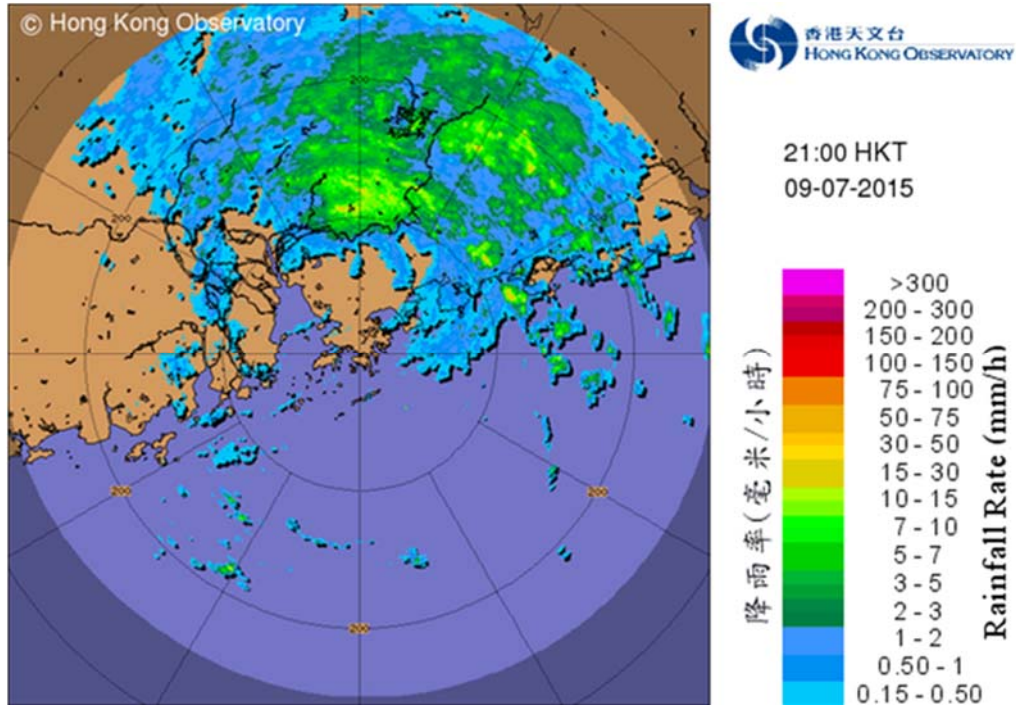


圖 3.2.5b 二零一五年七月九日下午 9 時的雷達回波圖像，蓮花最接近本港的一刻。當時蓮花已減弱為熱帶風暴，其中心集結在天文台總部以北約 50 公里。與蓮花相關的雨帶主要集中在其環流的北面。

Figure 3.2.5b Radar echoes captured at 9 p.m. on 9 July 2015, when Linfa was closest to Hong Kong. Linfa had weakened into a tropical storm by then and its centre was about 50 km north of the Observatory Headquarters. Rainbands associated with Linfa were mostly confined to the northern side of its circulation.