3.4 強烈熱帶風暴帕卡 (1714)：二零一七年八月二十四日至二十七日

帕卡是二零一七年第四個影響香港並引致天文台需要發出八號烈風或暴風信號的熱帶氣旋。

熱帶低氣壓帕卡於八月二十四日晚上在馬尼拉以東約570公里的北太平洋西部上形成，初時大致向偏西方向移動。翌日帕卡發展為熱帶風暴，以西北路徑橫過呂宋。帕卡於八月二十六日早上進入南海，並繼續採取西北路徑加速移向廣東沿岸，晚間增強為強烈熱帶風暴，達到其最高強度，中心附近最高持續風速估計為每小時110公里。帕卡於八月二十七日早上在廣東西部沿岸珠海一帶登陸並逐漸減弱，當晚在廣西消散。

根據報章報導，帕卡及其殘餘在廣東、廣西、貴州及雲南帶來狂風暴雨，至少造成12人死亡，接近10萬人受災，直接經濟損失約3.7億元人民幣。在帕卡的吹襲下，澳門最少有八人受傷，多處地區出現水浸。一艘貨船在香港以東約120公里沉沒，11名船員獲救。

香港天文台在八月二十六日早上9時40分發出一號戒備信號，當時帕卡集結在香港之東南約730公里，日間本港吹和緩偏東風。隨著帕卡靠近廣東沿岸，天文台在當晚8時40分發出三號強風信號，當時帕卡位於香港之東南約370公里。晚上本港吹清勁至強風程度的東北風，離岸間中吹烈風。隨著帕卡迅速地靠近珠江口一帶，本港風力繼續增強，天文台在八月二十七日上午5時10分發出八號東南烈風或暴風信號，當時帕卡集結在香港天文台以南約100公里。黎明時份本港風力普遍達到烈風至暴風程度，高地間中吹颶風，而風向則由東北逐漸轉為東南。帕卡在早上7時左右最接近香港，位於香港天文台之西南約90公里。隨著帕卡移入廣東內陸，日間稍後本港風力開始減弱，天文台分別在下午1時40分及下午5時40分改發三號強風信號及一號戒備信號。晚上帕卡在廣西消散，天文台於下午10時10分取消所有熱帶氣旋警告信號。

在帕卡的影響下，昂坪、大美督及長洲錄得的最高每小時平均風速分別為每小時118、103及101公里，而最高陣風則分別為每小時173、146及155公里。尖鼻咀錄得最高潮位2.63米(海圖基準面以上)，而大埔滘則錄得最大風暴潮(天文潮高度以上)1.05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	996.5	27/8	上午 6 時 21 分
香港國際機場	995.5	27/8	上午 6 時 35 分
京士柏	996.7	27/8	上午 5 時 53 分
坪洲	995.5	27/8	上午 6 時 32 分
打鼓嶺	999.1	27/8	上午 6 時 22 分
大埔	999.1	27/8	上午 6 時 47 分
沙田	998.1	27/8	上午 6 時 01 分
上水	998.2	27/8	上午 6 時 42 分
流浮山	997.7	27/8	上午 6 時 27 分
長洲	993.8	27/8	上午 6 時 18 分
橫瀾島	994.0	27/8	上午 5 時 49 分

八月二十六日本港大致天晴，日間天氣酷熱。受帕卡相關的雨帶影響，本港當晚開始有驟雨。八月二十七日及二十八日本港有狂風大雨及雷暴，天文台在這兩天的早上都曾發出黃色暴雨警告。這三天期間本港大部分地區共錄得超過250毫米雨量。

帕卡吹襲香港期間，最少有62人受傷，另有超過2 000宗塌樹報告、16宗水浸報告及一宗山泥傾瀉報告，西環及九龍城有外牆棚架被吹倒。風暴期間兩人在飛鵝山遠足時受傷被困，需要消防員拯救，一名消防員在行動中受傷。八月二十七日及二十八日早上的暴雨期間導致多區道路出現水浸。東鐵大學站附近有大樹倒塌，列車服務一度受阻。香港國際機場有超過670班航班取消或延誤，50班航班需要轉飛其它地方。

表3.4.1 - 3.4.4 分別是帕卡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3.4.1 - 3.4.3分別為帕卡的路徑圖、本港的雨量分佈圖及香港各站錄得的風向和風速。圖3.4.4顯示長洲及大美督錄得的風速。 圖3.4.5顯示天文台總部及長洲錄得的海平面氣壓。 圖3.4.6 - 3.4.7 分別為帕卡的衛星及雷達圖像。帕卡在香港造成的破壞可參見圖3.4.8。

3.4 Severe Tropical Storm Pakhar (1714): 24 – 27 August 2017

Pakhar was the fourth tropical cyclone affecting Hong Kong and necessitating the issuance of the No. 8 Gale or Storm Signal in 2017.

Pakhar formed as a tropical depression over the western North Pacific about 570 km east of Manila on the night of 24 August. Moving generally westwards at first, it developed into a tropical storm the next day and moved northwestwards across Luzon. After entering the South China Sea on the morning of 26 August, Pakhar maintained a northwestward track and accelerated towards the coast of Guangdong. It intensified into a severe tropical storm during the night, reaching its peak intensity with an estimated sustained wind of 110 km/h near its centre. After making landfall over the coast of western Guangdong in the vicinity of Zhuhai on the morning of 27 August, Pakhar weakened gradually and dissipated over Guangxi that night.

According to press reports, Pakhar and its remnant brought heavy rain and squalls to Guangdong, Guangxi, Guizhou and Yunnan, resulting in at least 12 deaths. Around 100 000 people were affected with direct economic loss around 370 million RMB. In Macao, eight people were injured and many places were flooded during the passage of Pakhar. A cargo vessel sunk about 120 km east of Hong Kong and 11 crew members on board were rescued.

In Hong Kong, the No. 1 Standby Signal was issued at 9:40 a.m. on 26 August when Pakhar was about 730 km southeast of the territory. Moderate easterlies affected Hong Kong during the day. As Pakhar edged closer to the coast of Guangdong, the No. 3 Strong Wind Signal was issued at 8:40 p.m. that night when Pakhar was about 370 km southeast of Hong Kong. Local winds gradually became fresh to strong northeasterly during the night and occasionally reached gale force offshore. As Pakhar moved quickly towards the Pearl River Estuary, local winds continued to strengthen and the No. 8 Southeast Gale or Storm Signal was issued at 5:10 a.m. on 27 August when Pakhar was about 100 km south of the Hong Kong Observatory. Gale to storm force winds generally affected the territory around dawn, occasionally reaching hurricane force on high ground and with wind direction gradually veering from northeasterly to southeasterly. Pakhar came closest to Hong Kong around 7 a.m. that morning with its centre passing only about 90 km southwest of the Hong Kong Observatory. With Pakhar moving into inland Guangdong, local winds started to weaken later that day and the No. 3 Strong Wind Signal and No. 1 Standby Signal were issued at 1:40 p.m. and 5:40 p.m. respectively. Pakhar dissipated over Guangxi during the night and all tropical cyclone warning signals were cancelled at 10:10 p.m.

Under the influence of Pakhar, maximum hourly mean winds of 118, 103 and 101 km/h and gusts of 173, 146 and 155 km/h were recorded at Ngong Ping, Tai Mei Tuk and Cheung Chau respectively. A maximum sea level (above chart datum) of 2.63 m was recorded at Tsim Bei Tsui, and a maximum storm surge (above astronomical tide) of 1.05 m was recorded at Tai Po Kau. 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	996.5	27/8	6:21 a.m.
Hong Kong International Airport	995.5	27/8	6:35 a.m.
King's Park	996.7	27/8	5:53 a.m.
Peng Chau	995.5	27/8	6:32 a.m.
Ta Kwu Ling	999.1	27/8	6:22 a.m.
Tai Po	999.1	27/8	6:47 a.m.
Shatin	998.1	27/8	6:01 a.m.
Sheung Shui	998.2	27/8	6:42 a.m.
Lau Fau Shan	997.7	27/8	6:27 a.m.
Cheung Chau	993.8	27/8	6:18 a.m.
Waglan Island	994.0	27/8	5:49 a.m.

Locally, it was mainly fine and very hot during the day on 26 August. Showers set in at night under the influence of the rainbands associated with Pakhar. Heavy rain with squalls and thunderstorms affected the territory on 27 and 28 August, and Amber Rainstorm Warnings were issued by the Observatory in the morning on both days. More than 250 millimetres of rainfall were recorded over most part of the territory during the 3-day period.

In Hong Kong, at least 62 people were injured during the passage of Pakhar. There were more than 2 000 reports of fallen trees, 16 reports of flooding and one report of landslide. Some scaffolding in Sai Wan and Kowloon City collapsed. Two hikers were hurt and stranded on Kowloon Peak and had to be rescued by firemen. One fireman was injured during the rescue operation. Many roads were flooded during the rainstorms on the mornings of 27 and 28 August. Fallen trees near the University Station of the East Rail Line resulted in a disruption of train services. More than 670 flights were cancelled or delayed at the Hong Kong International Airport, and 50 flights were diverted.

Information on the maximum wind, periods of strong and gale force winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Pakhar is given in Tables 3.4.1 - 3.4.4 respectively. Figures 3.4.1 - 3.4.3 show respectively the track of Pakhar, the rainfall distribution for Hong Kong and the winds recorded at various stations in Hong Kong. Figure 3.4.4 shows the wind speed recorded at Cheung Chau and Tai Mei Tuk. Figure 3.4.5 shows the traces of mean sea-level pressure recorded at the Hong Kong Observatory's Headquarters and Cheung Chau. Fugures 3.4.6 - 3.4.7 show respectively a satellite imagery and radar imageries of Pakhar. Some damages caused by Pakhar in Hong Kong are illustrated in Figure 3.4.8.

表 3.4.1　在帕卡影響下，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 3.4.1　Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when the tropical cyclone warning signals for Pakhar 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)	東北偏東	ENE	117	27/8	05:33	東南偏東	ESE	68	27/8	07:00
中環碼頭	Central Pier	東	E	113	27/8	05:13	東	E	63	27/8	06:00
長洲	Cheung Chau	東	E	155	27/8	06:18	東南偏東	ESE	101	27/8	08:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	146	27/8	06:17	東	E	101	27/8	07:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	101	27/8	07:59	東南偏東	ESE	68	27/8	08:00
啟德	Kai Tak	東	E	121	27/8	07:31	東	E	52	27/8	07:00
京士柏	King's Park	東南偏東	ESE	108	27/8	06:54	東南偏東	ESE	47	27/8	07:00
流浮山	Lau Fau Shan	東北偏東	ENE	99	27/8	06:52	東北偏東	ENE	54	27/8	07:00
昂坪	Ngong Ping	東南偏東	ESE	173	27/8	08:14	東	E	118	27/8	08:00
北角	North Point	東北偏東	ENE	128	27/8	06:14	東北偏東	ENE	72	27/8	06:00
坪洲	Peng Chau	東	E	122	27/8	06:26	東	E	79	27/8	07:00
平洲	Ping Chau	東	E	75	27/8	05:40	東	E	22	27/8	05:00
西貢	Sai Kung	東北	NE	128	27/8	05:44	東北偏東	ENE	67	27/8	06:00
沙洲	Sha Chau	東南偏東	ESE	110	27/8	07:49	東南	SE	77	27/8	09:00
沙螺灣	Sha Lo Wan	東南	SE	117	27/8	09:26	東	E	58	27/8	08:00
沙田	Sha Tin	北	N	112	27/8	05:46	東北	NE	31	27/8	07:00
石崗	Shek Kong	東北偏東	ENE	101	27/8	07:12	東北	NE	41	27/8	06:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	112	27/8	06:34	東	E	58	27/8	07:00
打鼓嶺	Ta Kwu Ling	東	E	88	27/8	08:08	東北	NE	34	27/8	07:00
大美督	Tai Mei Tuk	東北偏東	ENE	146	27/8	06:06	東北偏東	ENE	103	27/8	07:00
大帽山	Tai Mo Shan	東南	SE	182	27/8	09:00	東南	SE	121	27/8	10:00
大埔滘	Tai Po Kau	東	E	110	27/8	06:10	東	E	68	27/8	07:00
塔門*	Tap Mun*	東北偏東	ENE	149	27/8	07:12	東	E	101	27/8	08:00
大老山	Tate's Cairn	東	E	169	27/8	06:19	東南偏東	ESE	108	27/8	07:00
將軍澳	Tseung Kwan O	東南偏東	ESE	90	27/8	08:29	東南偏東	ESE	27	27/8	09:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東	E	92	27/8	07:28	東南偏東	ESE	31	27/8	07:00
屯門政府合署	Tuen Mun Government Offices	東南	SE	110	27/8	07:57	東南	SE	40	27/8	09:00
橫瀾島	Waglan Island	東	E	144	27/8	05:49	東	E	108	27/8	06:00
濕地公園	Wetland Park	東北偏東	ENE	81	27/8	06:27	東北偏東	ENE	31	27/8	07:00
黃竹坑	Wong Chuk Hang	東南偏東	ESE	110	27/8	06:24	東	E	40	27/8	07:00

*新塔門測風站在 2017 年 7 月 6 日取代在塔門警崗屋頂的舊測風站

*The old wind station on the rooftop of Tap Mun Police Post is replaced by the new Tap Mun station on 6 July 2017.

青洲 - 沒有資料　Green Island - data not available

表 3.4.2　在帕卡影響下，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 3.4.2　Periods during which sustained strong and gale force winds were attained at the eight reference anemometers in the tropical cyclone warning system when tropical cyclone warning signals for Pakhar were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風* 時間 Start time when strong wind speed* was attained		最後達到強風* 時間 End time when strong wind speed* was attained		最初達到烈風# 時間 Start time when gale force wind speed# was attained		最後達到烈風# 時間 End time when gale force wind speed# was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	27/8	0051	27/8	2121	27/8	0510	27/8	1718
香港國際機場	Hong Kong International Airport	27/8	0451	27/8	2047	27/8	0631	27/8	0901
啟德	Kai Tak	27/8	0506	27/8	1438	27/8	0622	27/8	0735
流浮山	Lau Fau Shan	27/8	0505	27/8	0945	-			
西貢	Sai Kung	27/8	0315	27/8	1727	27/8	0505	27/8	0656
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	27/8	0642	27/8	0647	-			

沙田及打鼓嶺的持續風力未達到強風程度。

The sustained wind speed did not attain strong force at Sha Tin and Ta Kwu Ling.

- 未達到指定的風速
- not attaining the specified wind speed

* 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:　本表列出持續風力達到強風及烈風程度的起始及終結時間。期間風力可能高於或低於指定的風力。

Note: The table gives the start and end time of sustained strong or gale force winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.4.3　帕卡掠過期間，香港天文台總部及其他各站所錄得的日雨量

Table 3.4.3　Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Pakhar

站 (參閱圖 3.4.2) Station (See Fig. 3.4.2)			八月二十六日 26 Aug	八月二十七日 27 Aug	八月二十八日 28 Aug	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			6.3	165.3	98.3	269.9
香港國際機場 Hong Kong International Airport (HKA)			2.5	136.2	25.7	164.4
長洲 Cheung Chau (CCH)			2.5	73.0	24.5	100.0
H23	香港仔	Aberdeen	2.0	121.0	90.0	213.0
N05	粉嶺	Fanling	13.5	143.0	92.5	249.0
N13	糧船灣	High Island	3.5	143.5	120.5	267.5
K04	佐敦谷	Jordan Valley	6.5	184.0	80.0	270.5
N06	葵涌	Kwai Chung	4.0	170.5	100.0	274.5
H12	半山區	Mid Levels	3.0	171.5	89.0	263.5
N09	沙田	Sha Tin	6.5	198.5	76.5	281.5
H19	筲箕灣	Shau Kei Wan	0.5	176.0	89.5	266.0
SEK	石崗	Shek Kong	8.0	188.0	[39.5]	[235.5]
K06	蘇屋邨	So Uk Estate	4.5	207.5	113.5	325.5
R31	大美督	Tai Mei Tuk	16.5	183.5	[58.5]	[258.5]
R21	踏石角	Tap Shek Kok	1.5	110.0	[36.5]	[148.0]
TMR	屯門水庫	Tuen Mun Reservoir	4.4	132.0	31.0	167.4
N17	東 涌	Tung Chung	2.0	176.0	37.0	215.0

註 : [ ] 基於不完整的每小時雨量數據。Note : [ ] based on incomplete hourly data.

表 3.4.4　帕卡掠過期間，香港各潮汐站所錄得的最高潮位及最大風暴潮

Table 3.4.4　Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Pakhar

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	2.23	27/8	02:45	0.72	27/8	06:57
石壁	Shek Pik	2.38	27/8	12:22	0.67	27/8	06:52
大廟灣	Tai Miu Wan	2.23	27/8	00:51	0.82	27/8	05:49
大埔滘	Tai Po Kau	2.28	27/8	02:14	1.05	27/8	07:54
尖鼻咀	Tsim Bei Tsui	2.63	27/8	12:51	0.96	27/8	10:36
橫瀾島	Waglan Island	2.27	27/8	02:48	0.49	27/8	02:49

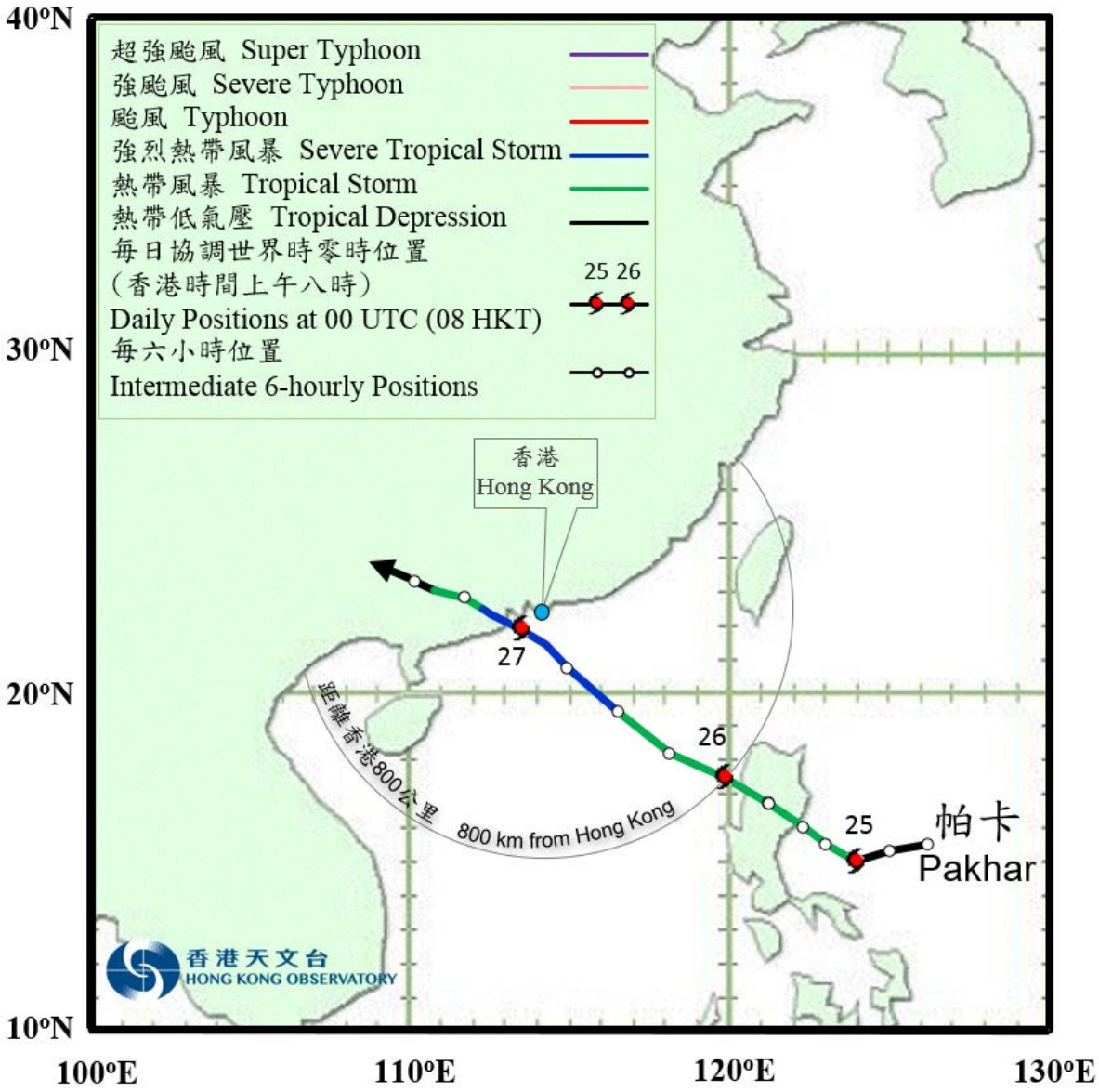

圖 3.4.1a　二零一七年八月二十四日至二十七日帕卡的路徑圖。

Figure 3.4.1a　Track of Pakhar on 24 - 27 August 2017.

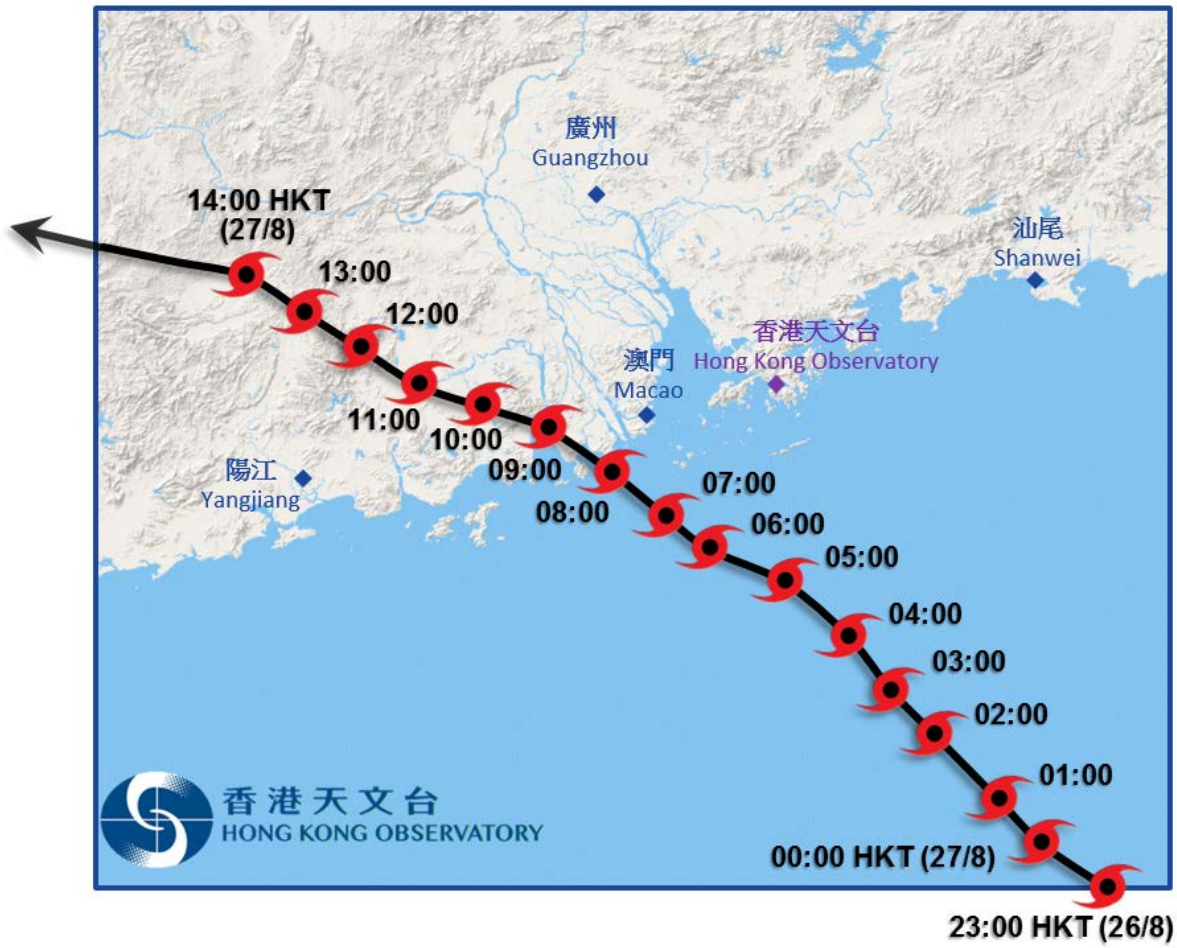

圖 3.4.1b　　帕卡接近香港時的路徑圖。

Figure 3.4.1b　　Track of Pakhar near Hong Kong.

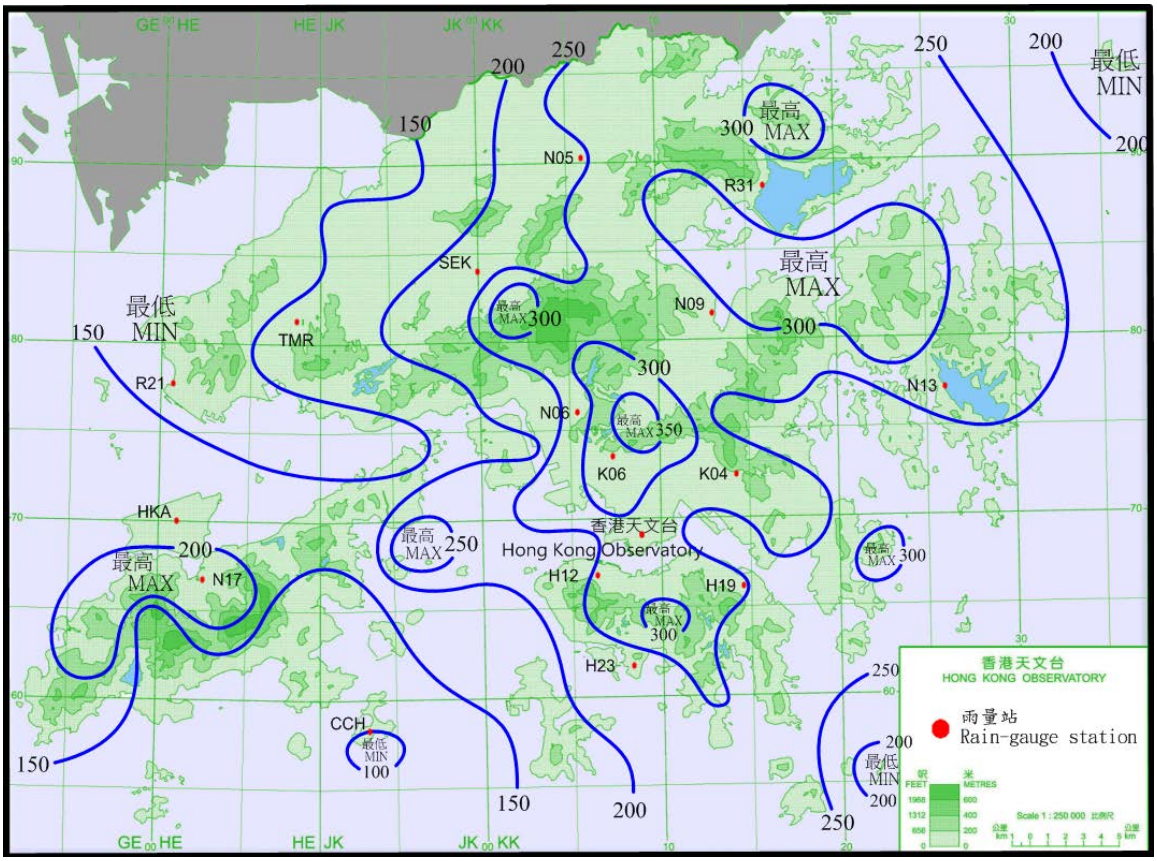

圖 3.4.2　　二零一七年八月二十六日至二十八日的雨量分佈(等雨量線單位為毫米)。

Figure 3.4.2　Rainfall distribution on 26 - 28 August 2017 (isohyets in millimetres).

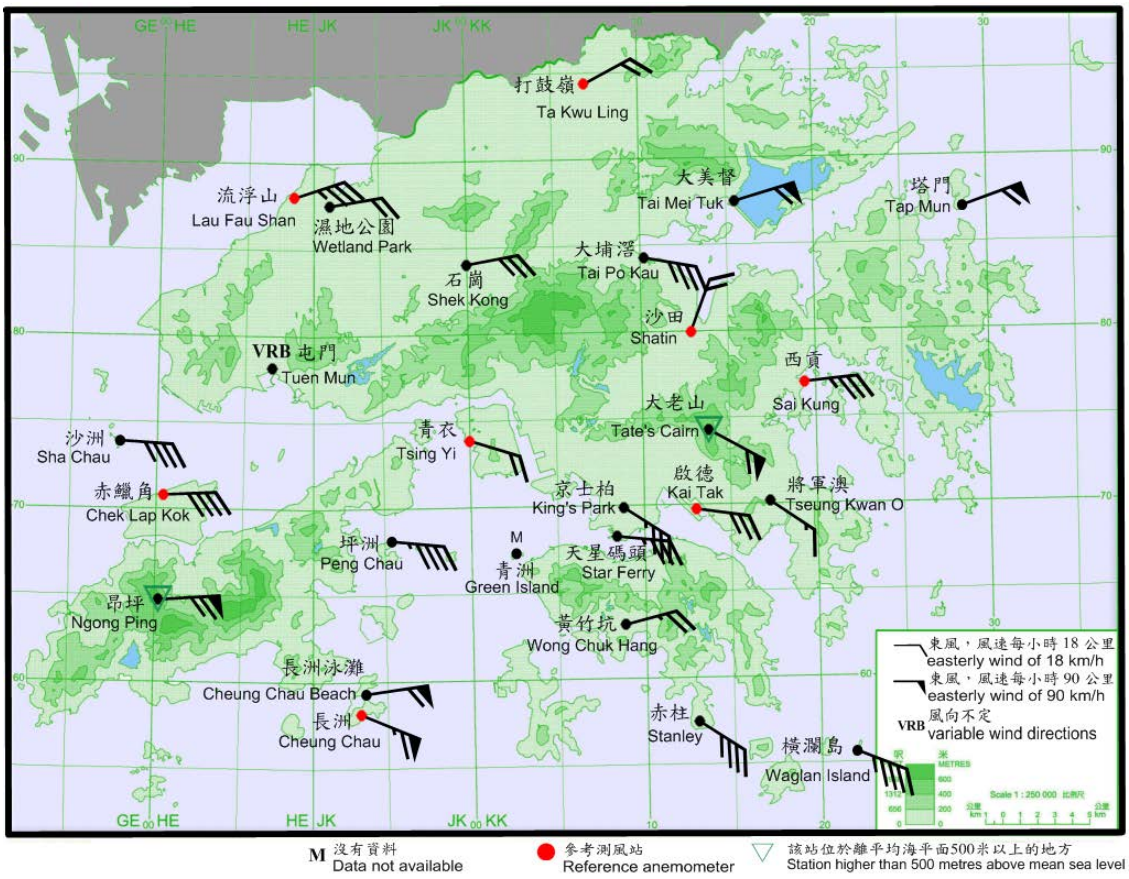

圖 3.4.3　二零一七年八月二十七日上午 7 時正香港各站錄得的十分鐘平均風向和風速。當時昂坪風力達到颶風程度，而大老山、長洲、長洲泳灘、塔門及大美督的風力達到暴風程度。

Figure 3.4.3　10-minute mean wind direction and speed recorded at various stations in Hong Kong at 7:00 a.m. on 27 August 2017. Winds at Ngong Ping reached hurricane force, while winds at Tate's Cairn, Cheung Chau, Cheung Chau Beach, Tap Mun and Tai Mei Tuk reached storm force at the time.

註:　當時屯門錄得的十分鐘平均風速為每小時 13 公里。

Note:　The 10-minute mean wind speeds recorded at the time at Tuen Mun was 13 km/h.

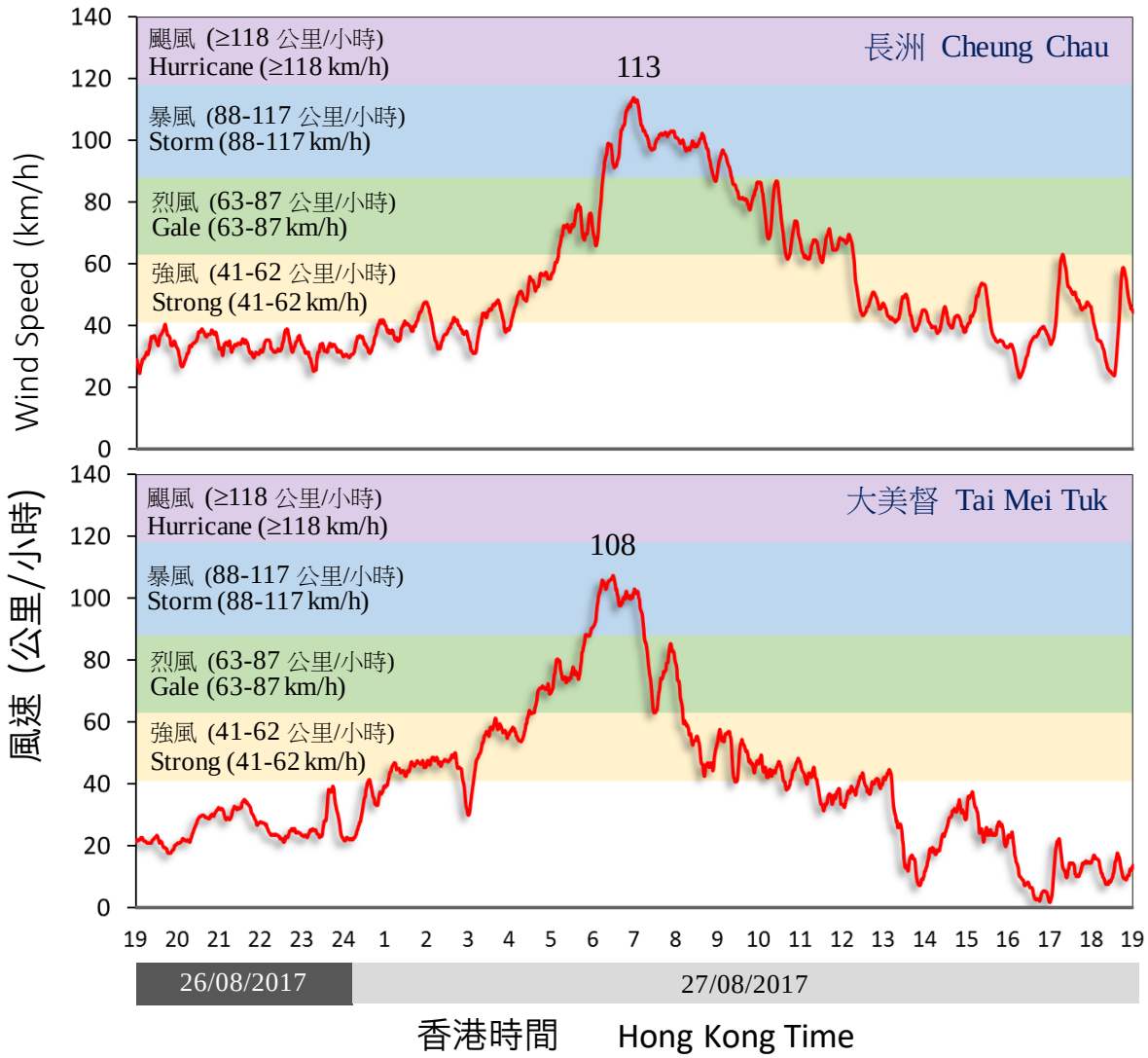

圖 3.4.4 二零一七年八月二十六至二十七日長洲及大美督錄得的十分鐘風速。

Figure 3.4.4 Traces of 10-minute wind speed recorded at Cheung Chau and Tai Mei Tuk on 26 and 27 August 2017.

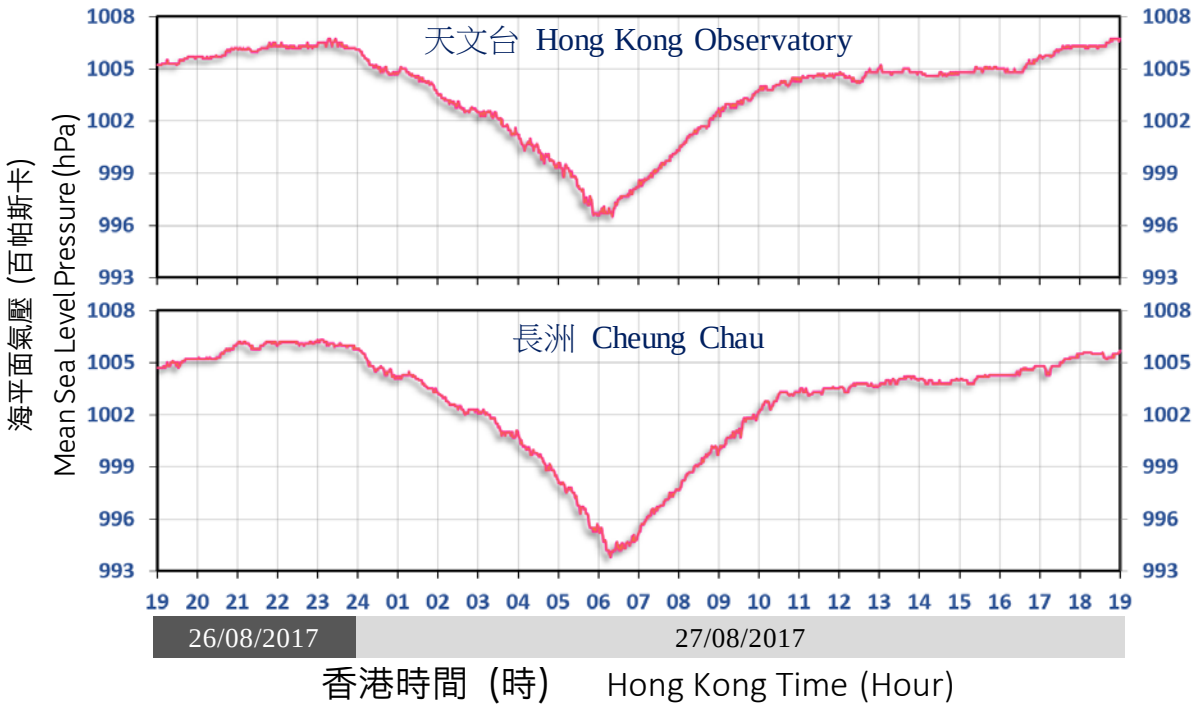

圖 3.4.5 二零一七年八月二十六日至二十七日天文台總部(上圖)及長洲(下圖)錄得的海平面氣壓。

Figure 3.4.5 Traces of mean sea-level pressure recorded at the Observatory Headquarters (top panel) and Cheung Chau (bottom panel) on 26 and 27 August 2017.

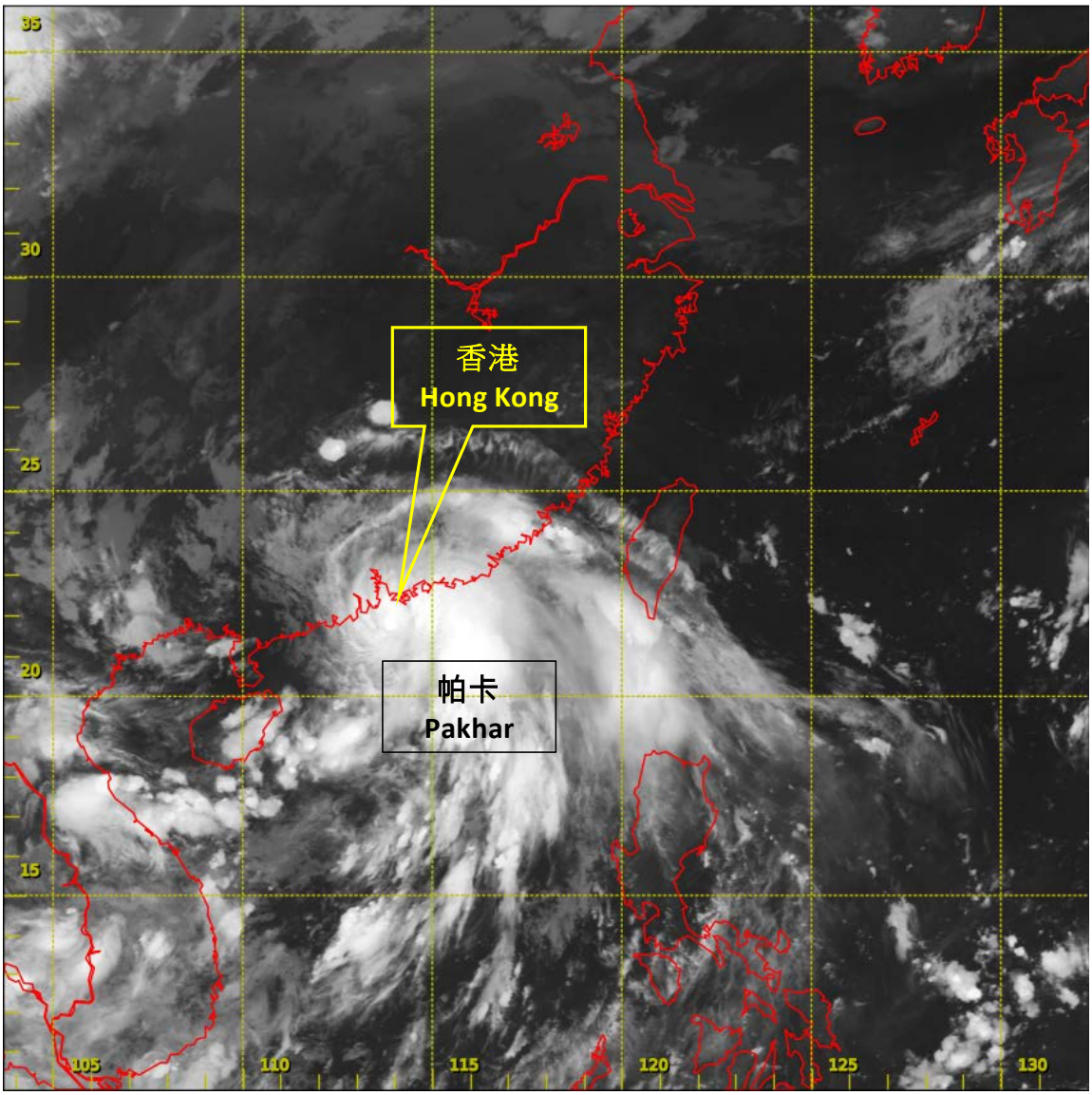

圖 3.4.6　二零一七年八月二十七日上午 5 時左右的紅外線衛星圖片，當時帕卡達到其最高強度，中心附近最高持續風速估計為每小時 110 公里。

Figure 3.4.6　Infra-red satellite imagery around 5 a.m. on 27 August 2017, when Pakhar was at peak intensity with estimated maximum sustained winds of 110 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 Himawari-8 Satellite (H-8) of Japan Meteorological Agency (JMA).]

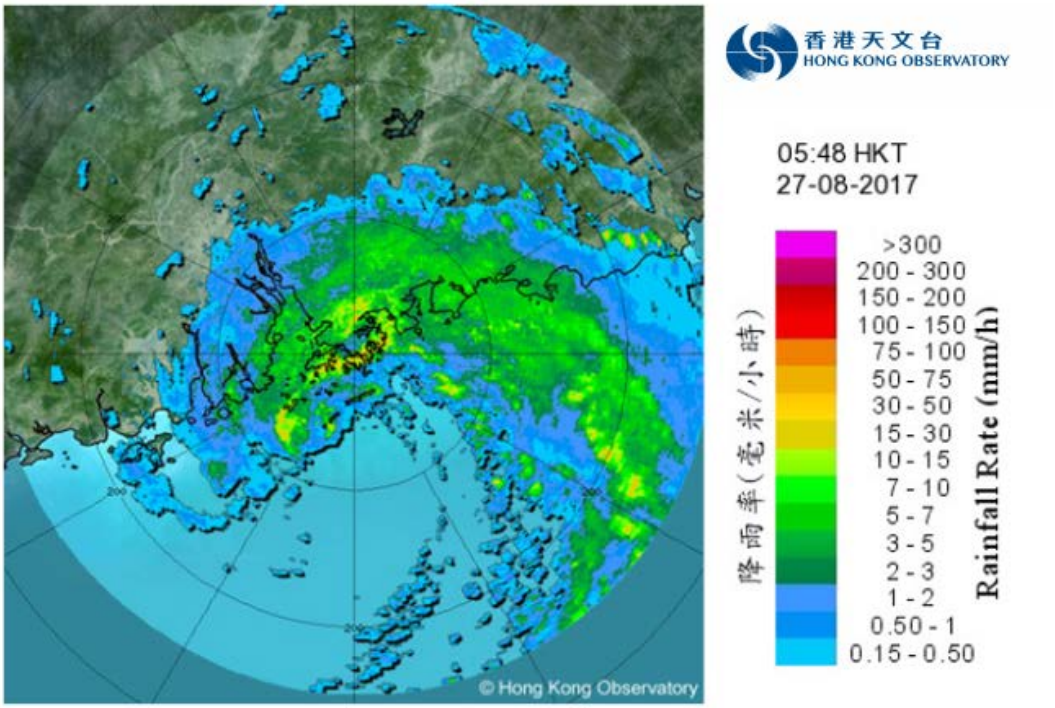

圖 3.4.7a　二零一七年八月二十七日上午 5 時 48 分的雷達回波圖像，當時帕卡北面的強雨帶正為本港帶來狂風大雨。

Figure 3.4.7a　Image of radar echoes at 5:48 a.m. on 27 August 2017, when the intense rainbands to the north of Pakhar were bringing heavy rain and squalls to Hong Kong.

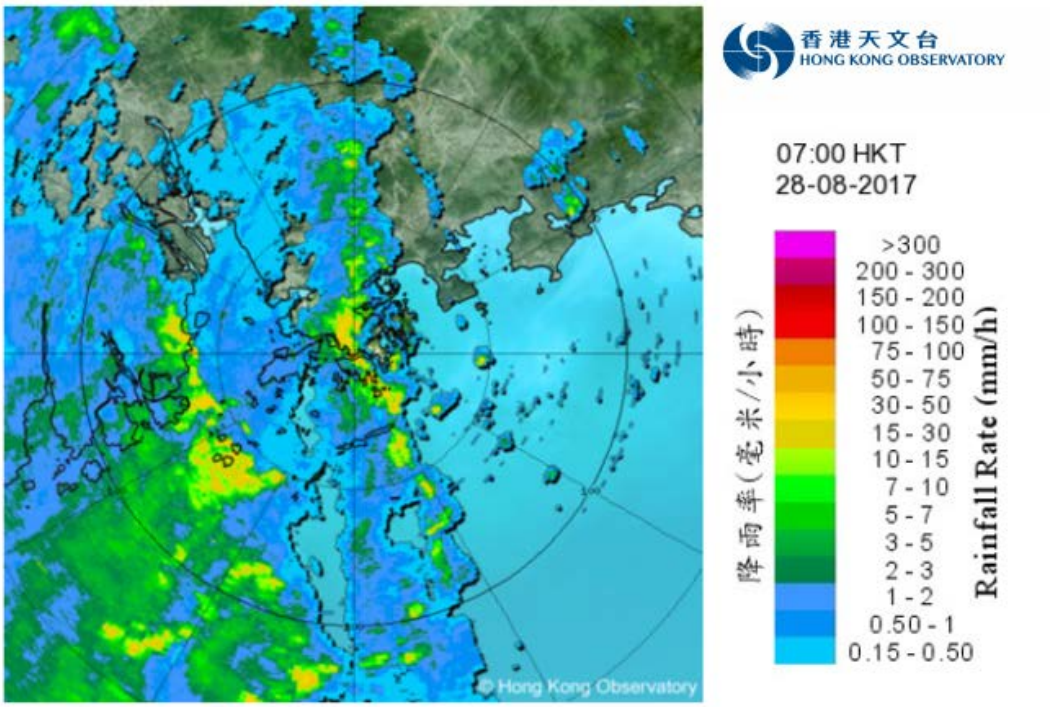

圖 3.4.7b　二零一七年八月二十八日上午 7 時的雷達回波圖像。帕卡已減弱為一個低壓區，但與其殘餘相關連的雨帶正為本港帶來暴雨。

Figure 3.4.7b　Image of radar echoes at 7 a.m. on 28 August 2017. Pakhar had already weakened into an area of low pressure but the rainbands associated with its remnant were bringing rainstorms to Hong Kong.

圖 3.4.8　荔枝角附近長沙灣道有大樹倒塌。(圖片鳴謝: 社區天氣觀測計劃 Kit Lo)

Figure 3.4.8　Fallen trees at Cheung Sha Wan Road near Lai Chi Kok. (photo courtesy of Kit Lo from Community Weather Observation Scheme)