

3.8 超強颱風莎莉嘉(1621)：二零一六年十月十三日至十九日

莎莉嘉是二零一六年第八個導致香港天文台需要發出熱帶氣旋警告信號的熱帶氣旋。

熱帶低氣壓莎莉嘉於十月十三日早上在馬尼拉以東約1 060公里的北太平洋西部上形成，並採取西北偏西路徑移向菲律賓。莎莉嘉當晚已增強為熱帶風暴，翌日更迅速增強，於十月十五日晚上發展為超強颱風並達到其最高強度，中心附近最高持續風速估計為每小時185公里。莎莉嘉於十月十六日清晨橫過呂宋時減弱為颱風，進入南海後重新組織。十月十八日早上莎莉嘉在海南島登陸，其後轉向西北移動。十月十九日莎莉嘉橫過北部灣，當天稍後在廣西內陸消散。

根據報章報導，莎莉嘉吹襲菲律賓期間造成最少三人死亡，三人失蹤，多處出現山泥傾瀉，多間房屋倒塌。莎莉嘉吹襲廣東、廣西及海南期間，造成最少370萬人受災，直接經濟損失接近55億元人民幣。

香港天文台於十月十六日晚上9時20分發出一號戒備信號，當時莎莉嘉集結在香港之東南偏南約680公里。當晚及翌日早上本港普遍吹和緩至清勁東北風。由於預料當莎莉嘉移至香港的西南方時本地風力會逐漸增強，天文台於十月十七日下午1時40分發出三號強風信號，當時莎莉嘉集結在本港之西南偏南約550公里。在莎莉嘉及東北季候風的共同影響下，當日下午及翌日本港普遍吹清勁至強風程度的偏東風，離岸及高地間中吹烈風。

莎莉嘉於十月十八日上午5時左右最接近香港，在香港西南約520公里處掠過。天文台總部則在當日下午2時57分錄得最低瞬時海平面氣壓1006.3百帕斯卡。隨著莎莉嘉於十月十八日晚上進入北部灣並進一步減弱，香港逐漸受東北季候風影響，天文台於晚上10時10分取消所有熱帶氣旋警告信號，並接續發出強烈季候風信號。受東北季候風影響，晚間本港多處地區間中吹強風，強烈季候風信號一直維持至翌日早上8時45分才取消。

莎莉嘉影響香港期間，尖鼻咀錄得最高潮位(海圖基準面以上) 3.00米，而大埔滘則錄得最大風暴潮(天文潮高度以上) 0.59米。

十月十七日本港早上短暫時間有陽光，但在莎莉嘉的影響下，下午轉為多雲及有幾陣狂風驟雨。莎莉嘉的外圍偏南氣流與東北季候風的輻合引致本港於十月十八日至十九日持續有大雨和雷暴。雨勢在十月十九日下午最大，為本港普遍帶來超過100毫米雨量，而市區、沙田及大埔的雨量更超過200毫米，自暴雨警告系統在1992年開始運作以來天文台首度在十月份發出黑色暴雨警告。天文台總部於當日下午三至四時錄得78.7毫米雨量，是自1884年有記錄以來十月份的最高一小時雨量紀錄。山泥傾瀉警告及新界北部水浸特別報告在當日亦曾經生效。

在莎莉嘉吹襲期間，香港有多宗塌樹報告及高空墜物意外。在強風大浪下，西貢橫洲對開海面有一艘內河船翻側，船上13名船員有12人獲救，但仍有一人失

蹤。在黃大仙及龍翔道折斷墜下的樹幹導致兩人受傷。深水埗通州街一個棚架倒塌，旺角西洋菜南街一幢商業大廈外牆亦有一幅廣告帆布被強風吹倒。元朗南坑排及荔枝角鍾山台分別有圍牆倒塌。

在十月十九日下午的暴雨期間，本港最少有14宗水浸報告及七宗山泥傾瀉報告。多區道路出現水浸，交通大受影響。其中柴灣及大潭一帶的道路水浸最為嚴重，一輛電單車被沖走，多輛汽車被困。洪水亦沖入柴灣一商場內的店舖。灣仔普樂里的一幅圍牆在暴雨下倒塌。

表3.8.1 - 3.8.4 分別是莎莉嘉影響香港期間各站錄得的最高風速、持續風力達到強風程度的時段、香港的日雨量及最高潮位資料。圖3.8.1 - 3.8.4 分別為莎莉嘉的路徑圖、本港的雨量分佈圖、莎莉嘉的衛星及雷達圖像。莎莉嘉在香港造成的破壞可參見圖3.8.5。

3.8 Super Typhoon Sarika (1621): 13 – 19 October 2016

Sarika was the eighth tropical cyclone necessitating the issuance of tropical cyclone warning signals by the Hong Kong Observatory in 2016.

Sarika formed as a tropical depression over the western North Pacific about 1 060 km east of Manila on the morning of 13 October. Taking a west-northwesterly track towards the Philippines, it intensified into a tropical storm that night. Sarika further intensified rapidly the next day and developed into a super typhoon on the night of 15 October, reaching its peak intensity with an estimated sustained wind of 185 km/h near its centre. Sarika weakened into a typhoon while moving across Luzon in the early morning on 16 October. It re-organized after entering the South China Sea. Sarika made landfall over Hainan Island on the morning of 18 October and turned northwestwards. It moved across Beibu Wan on 19 October and dissipated over inland Guangxi later that day.

According to press reports, at least three persons were killed and three others were missing in the Philippines during the passage of Sarika. There were extensive landslides and many houses collapsed. In Guangdong, Guangxi and Hainan, at least 3.7 million people were affected with direct economic loss of around 5.5 billion RMB.

In Hong Kong, the Standby Signal No. 1 was issued at 9:20 p.m. on 16 October when Sarika was about 680 km south-southeast of the territory. Local winds were generally moderate to fresh northeasterly during the night and the next morning. As local winds were expected to strengthen gradually when Sarika moved to the southwest of Hong Kong, the Strong Wind Signal No. 3 was issued at 1:40 p.m. on 17 October when Sarika was about 550 km south-southwest of the territory. Under the combined effect of Sarika and the northeast monsoon, fresh to strong easterlies generally affected Hong Kong in the afternoon and the next day, with winds occasionally reaching gale force offshore and on high ground.

Sarika came closest to the territory around 5 a.m. on 18 October, passing at a distance of about 520 km southwest of Hong Kong. At the Observatory Headquarters, the lowest instantaneous mean sea-level pressure of 1006.3 hPa was recorded at 2:57 p.m. that day. As Sarika entered Beibu Wan and further weakened on the night of 18 October, Hong Kong came increasingly under the influence of the northeast monsoon. The Observatory cancelled all tropical cyclone warning signals at 10:10 p.m. that night and issued the Strong Monsoon Signal immediately afterwards. Under the influence of the northeast monsoon, occasional strong winds affected many places over the territory during the night. The Strong Monsoon Signal remained in force till 8:45 a.m. the next morning.

Under the influence of Sarika, a maximum sea level (above chart datum) of 3.00 m was recorded at Tsim Bei Tsui, while a maximum storm surge of 0.59 m (above astronomical tide) was recorded at Tai Po Kau.

Locally, there were sunny intervals on the morning of 17 October. Affected by Sarika, the weather became cloudy with a few squally showers in the afternoon. The convergence between the northeast monsoon and the southerly airstream associated with Sarika triggered prolonged periods of heavy rain and thunderstorms on 18 and 19 October. The rain was most intense on the afternoon of 19 October, with more than 100 millimetres of rainfall falling generally over Hong Kong and rainfall even exceeding 200 millimetres over the urban areas, Sha Tin and Tai Po, necessitating the issuance of the first ever Black Rainstorm Warning in October since the Rainstorm Warning System commenced operation in 1992. The hourly

rainfall of 78.7 millimetres recorded at the Observatory Headquarters between 3 and 4 p.m. that day was also the highest in October since records began in 1884. Landslip Warning and Special Announcement on Flooding in the Northern New Territories were also in force that day.

In Hong Kong, there were many reports of fallen trees and incidents of falling objects during the passage of Sarika. A river trade vessel was overturned in the waters off Wang Chau in Sai Kung under strong winds and rough seas. Of the 13 crew members on board, 12 were rescued but one was still missing. Falling tree branches injured two persons in Wong Tai Sin and Lung Cheung Road. Scaffoldings at Tung Chau Street in Sham Shui Po collapsed, and an advertisement banner of a commercial building at Sai Yeung Choi Street South in Mong Kok was also blown down. Walls at Nam Hang Pai in Yuen Long and Chung Shan Terrace in Lai Chi Kok collapsed

During the rainstorm on the afternoon of 19 October, there were at least 14 reports of flooding and seven reports of landslide in Hong Kong. Traffic was seriously disrupted as many roads were flooded, with roads near Chai Wan and Tai Tam being the worst affected. A motorcycle was swept away and many vehicles were marooned. Flood water rushed into the stores of a shopping mall in Chai Wan. A wall at Bullock Lane in Wan Chai collapsed under the heavy rain.

Information on the maximum wind, period of strong winds, daily rainfall and maximum sea level reached in Hong Kong during the passage of Sarika is given in Tables 3.8.1 - 3.8.4 respectively. Figures 3.8.1 - 3.8.4 show respectively the track of Sarika, the rainfall distribution for Hong Kong, satellite imageries and related radar imageries of Sarika. Some damages caused by Sarika in Hong Kong are illustrated in Figures 3.8.5.

表 3.8.1 在莎莉嘉影響下，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 3.8.1 Maximum gust peak speeds and maximum hourly mean winds with associated wind directions recorded at various stations when tropical cyclone warning signals for Sarika 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	76	17/10	19:46	東南偏東	ESE	47	18/10	18:00
中環碼頭	Central Pier	東	E	70	18/10	17:32	東	E	43	17/10	23:00
長洲	Cheung Chau	東南偏東	ESE	99	18/10	12:39	東南偏東	ESE	59	18/10	19:00
長洲泳灘	Cheung Chau Beach	東北偏東	ENE	104	18/10	12:18	東	E	67	18/10	13:00
青洲	Green Island	東北偏東	ENE	90	18/10	17:51	東北	NE	59	17/10	22:00
香港國際機場	Hong Kong International Airport	東南偏東	ESE	59	18/10	17:57	東	E	36	18/10	13:00
啟德	Kai Tak	東	E	83	18/10	17:22	東	E	41	18/10	18:00
京士柏	King's Park	東南偏東	ESE	59	18/10	08:32	東南	SE	30	18/10	22:00
流浮山	Lau Fau Shan	東	E	62	18/10	13:17	東北偏東	ENE	25	17/10	23:00
北角	North Point	東	E	76	18/10	08:04	東	E	45	18/10	08:00
坪洲	Peng Chau	東	E	72	18/10	12:12	東	E	51	18/10	13:00
平洲	Ping Chau	東北偏東	ENE	40	18/10	16:41	東	E	14	18/10	17:00
西貢	Sai Kung	東	E	77	18/10	15:16	東北偏東	ENE	40	18/10	09:00
沙洲	Sha Chau	東南偏東	ESE	63	18/10	12:37	東南偏東	ESE	41	18/10	20:00
沙螺灣	Sha Lo Wan	東	E	68	18/10	11:06	東北偏東	ENE	31	18/10	10:00
							東北偏東	ENE	31	18/10	11:00
							東	E	31	18/10	12:00
沙田	Sha Tin	東南	SE	62	18/10	15:29	東北	NE	16	17/10	09:00
							東北偏北	NNE	16	17/10	10:00
							東北	NE	16	18/10	10:00
							東	E	16	18/10	13:00
石崗	Shek Kong	東	E	67	18/10	17:45	東	E	31	18/10	13:00
九龍天星碼頭	Star Ferry (Kowloon)	東	E	75	18/10	07:43	東	E	40	18/10	13:00
打鼓嶺	Ta Kwu Ling	東	E	65	18/10	15:45	東北偏東	ENE	22	18/10	16:00
							東	E	22	18/10	19:00
大美督	Tai Mei Tuk	東南偏東	ESE	96	18/10	12:10	東	E	63	18/10	16:00
大帽山	Tai Mo Shan	東南	SE	118	18/10	17:42	東南偏東	ESE	77	18/10	15:00
大埔滘	Tai Po Kau	東南偏東	ESE	70	18/10	15:37	東	E	43	18/10	13:00
塔門	Tap Mun	東北偏東	ENE	67	18/10	08:09	東南偏東	ESE	34	18/10	18:00
大老山	Tate's Cairn	東	E	112	18/10	12:05	東	E	68	18/10	11:00
將軍澳	Tseung Kwan O	東	E	58	18/10	11:30	北	N	13	17/10	22:00
							東北偏北	NNE	13	17/10	23:00
青衣島蜆殼油庫	Tsing Yi Shell Oil Depot	東南偏東	ESE	59	18/10	12:19	東南偏東	ESE	23	18/10	13:00
屯門政府合署	Tuen Mun Government Offices	東南偏東	ESE	49	18/10	15:50	東南	SE	16	18/10	19:00
橫瀾島	Waglan Island	東北偏東	ENE	92	17/10	20:54	東北偏東	ENE	72	17/10	22:00
濕地公園	Wetland Park	東南偏東	ESE	43	18/10	12:58	東	E	16	18/10	13:00
		東	E	43	18/10	13:07					
黃竹坑	Wong Chuk Hang	西北偏北	NNW	70	18/10	20:21	西北偏北	NNW	30	18/10	08:00

昂坪- 沒有資料 Ngong Ping - data not available

表 3.8.2 在莎莉嘉影響下，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程度的時段

Table 3.8.2 Periods during which sustained strong winds were attained at the eight reference anemometers in the tropical cyclone warning system when the tropical cyclone warning signals for Sarika were in force

站 (參閱圖 1.1) Station (See Fig. 1.1)		最初達到強風*時 Start time when strong wind speed* was attained		最後達到強風*時間 End time when strong wind speed* was attained	
		日期/月份 Date/Month	時間 Time	日期/月份 Date/Month	時間 Time
長洲	Cheung Chau	17/10	18:45	18/10	22:10
香港國際機場	Hong Kong International Airport	18/10	12:47	18/10	18:07
啟德	Kai Tak	18/10	17:24	18/10	18:03
西貢	Sai Kung	18/10	08:41	18/10	15:27

流浮山、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 Lau Fau Shan, 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

註： 本表列出持續風力達到強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 winds. Winds might fluctuate above or below the specified wind speeds in between the times indicated.

表 3.8.3 莎莉嘉掠過香港期間，在香港天文台總部及其他各站所錄得的日雨量
Table 3.8.3 Daily rainfall amounts recorded at the Hong Kong Observatory Headquarters and other stations during the passage of Sarika

站 (參閱圖 3.8.2) Station (See Fig. 3.8.2)			十月十六日 16 Oct	十月十七日 17 Oct	十月十八日 18 Oct	十月十九日 19 Oct	總雨量(毫米) Total rainfall (mm)
香港天文台 Hong Kong Observatory			0.0	16.7	178.7	223.4	418.8
香港國際機場 Hong Kong International Airport (HKA)			0.0	11.3	87.2	58.3	156.8
長洲 Cheung Chau (CCH)			[0.0]	[7.0]	[46.5]	[31.5]	[85.0]
H23	香港仔 Aberdeen		0.0	17.5	99.0	134.0	250.5
N05	粉嶺 Fanling		0.0	9.0	135.5	231.5	376.0
N13	糧船灣 High Island		0.0	15.5	97.0	79.0	191.5
K04	佐敦谷 Jordan Valley		0.0	19.0	197.0	225.0	441.0
N06	葵涌 Kwai Chung		0.0	14.0	167.5	212.5	394.0
H12	半山區 Mid Levels		0.0	20.0	163.0	155.0	338.0
N09	沙田 Sha Tin		0.0	15.0	205.5	199.5	420.0
H19	筲箕灣 Shau Kei Wan		0.0	21.5	171.5	240.5	433.5
SEK	石崗 Shek Kong		[0.0]	[12.5]	[175.5]	[128.0]	[316.0]
K06	蘇屋邨 So Uk Estate		0.0	17.5	176.0	221.0	414.5
R31	大美督 Tai Mei Tuk		0.5	14.5	139.0	137.5	291.5
R21	踏石角 Tap Shek Kok		0.0	11.0	90.5	44.5	146.0
TMR	屯門水庫 Tuen Mun Reservoir		0.0	8.1	91.7	71.2	171.0
N17	東涌 Tung Chung		0.0	14.5	103.0	50.5	168.0

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

表 3.8.4 莎莉嘉掠過香港期間，在香港各潮汐站所錄得的最高潮位及最大風暴潮
Table 3.8.4 Times and heights of the maximum sea level and the maximum storm surge recorded at tide stations in Hong Kong during the passage of Sarika

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
鯪魚涌	Quarry Bay	2.74	17/10	22:11	0.43	18/10	10:58
石壁	Shek Pik	2.87	17/10	23:19	0.52	18/10	11:59
大廟灣	Tai Miu Wan	2.73	17/10	22:12	0.45	18/10	10:57
大埔滘	Tai Po Kau	2.83	17/10	22:51	0.59	18/10	04:11
尖鼻咀	Tsim Bei Tsui	3.00	17/10	23:10	0.57	18/10	20:09
橫瀾島	Waglan Island	2.87	17/10	22:17	0.46	18/10	11:26

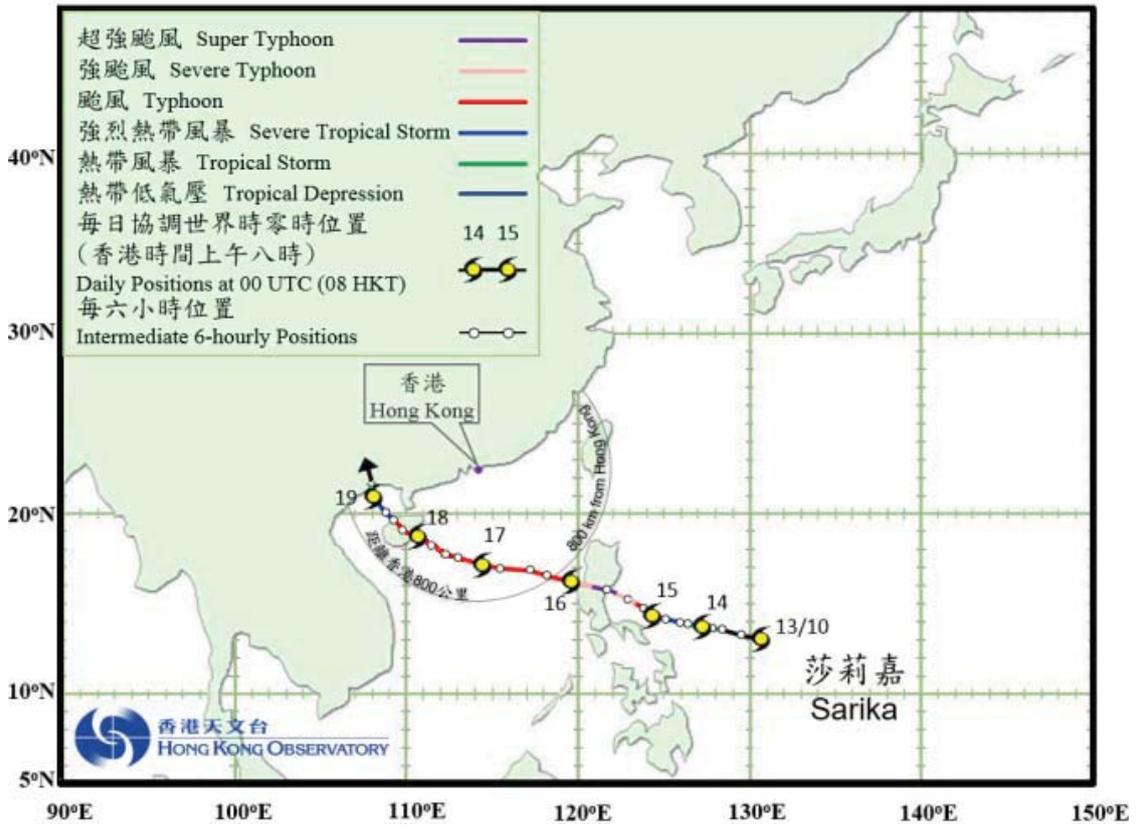


圖 3.8.1 二零一六年十月十三日至十九日莎莉嘉(1621)的路徑圖。
 Figure 3.8.1 Track of Sarika (1621) on 13 - 19 October 2016.

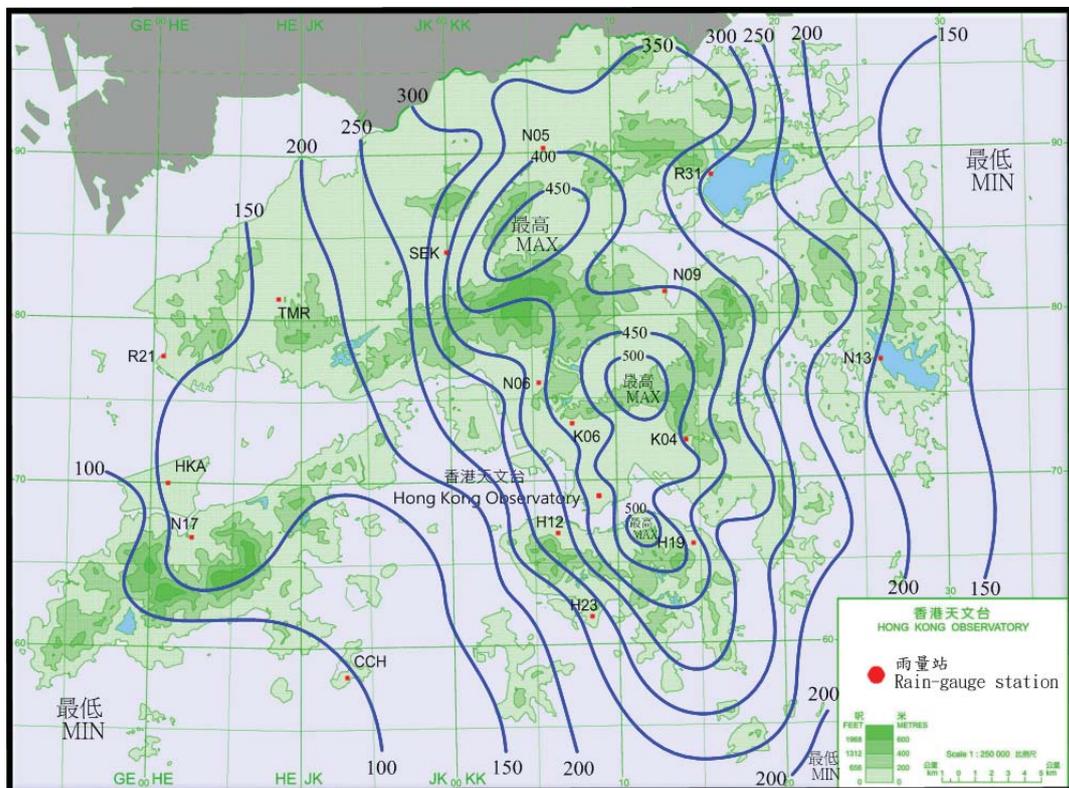


圖 3.8.2 二零一六年十月十六日至十九日的雨量分佈(等雨量線單位為毫米)。
 Figure 3.8.2 Rainfall distribution on 16 – 19 October 2016 (isohyets are in millimetres).

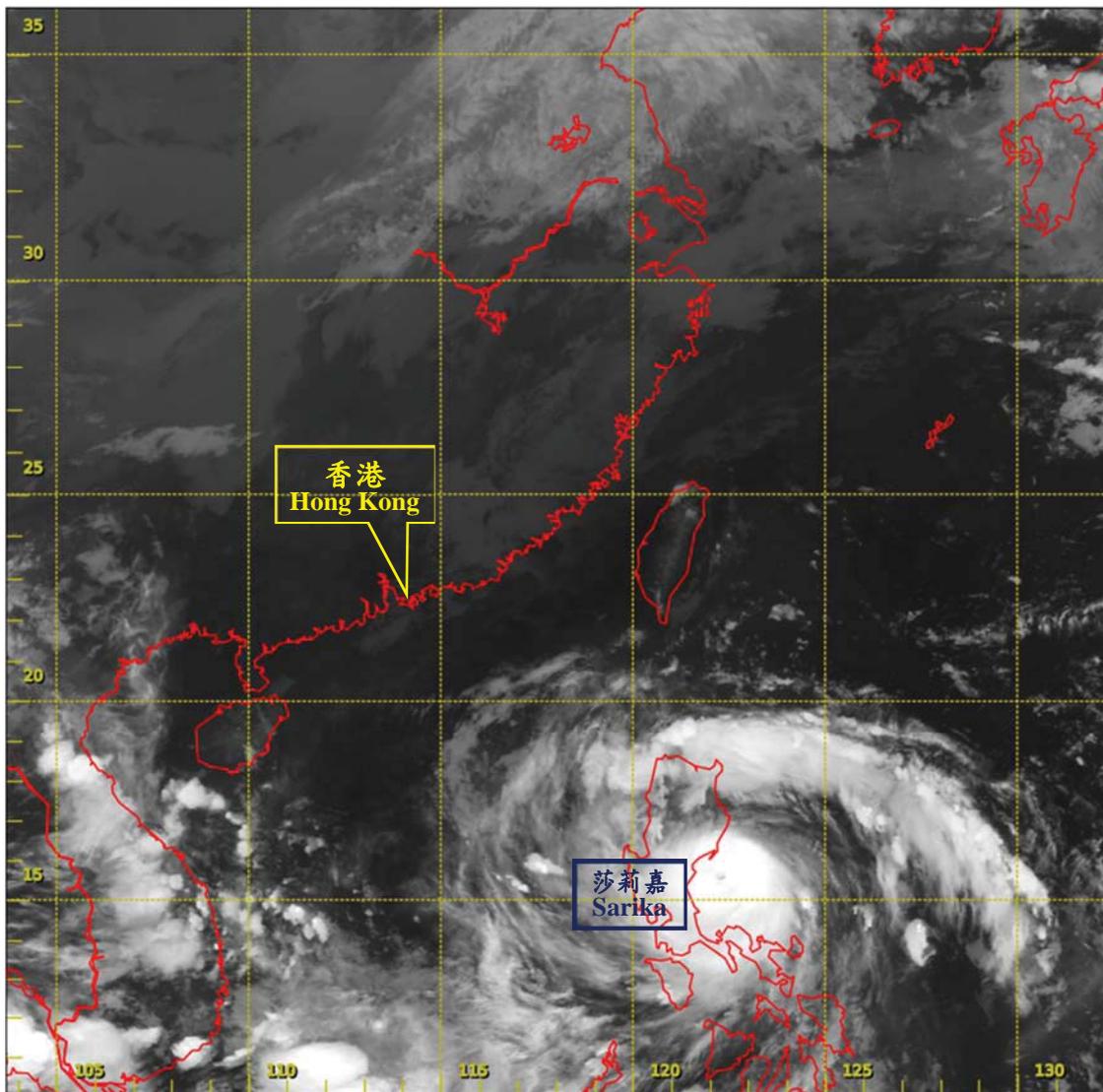


圖 3.8.3a 二零一六年十月十五日晚上 11 時左右的紅外線衛星圖片，當時莎莉嘉達到其最高強度，中心附近最高持續風速估計為每小時 185 公里。

Figure 3.8.3a Infra-red satellite imagery around 11 p.m. on 15 October 2016 when Sarika was at its peak intensity with estimated maximum sustained winds of 185 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).]

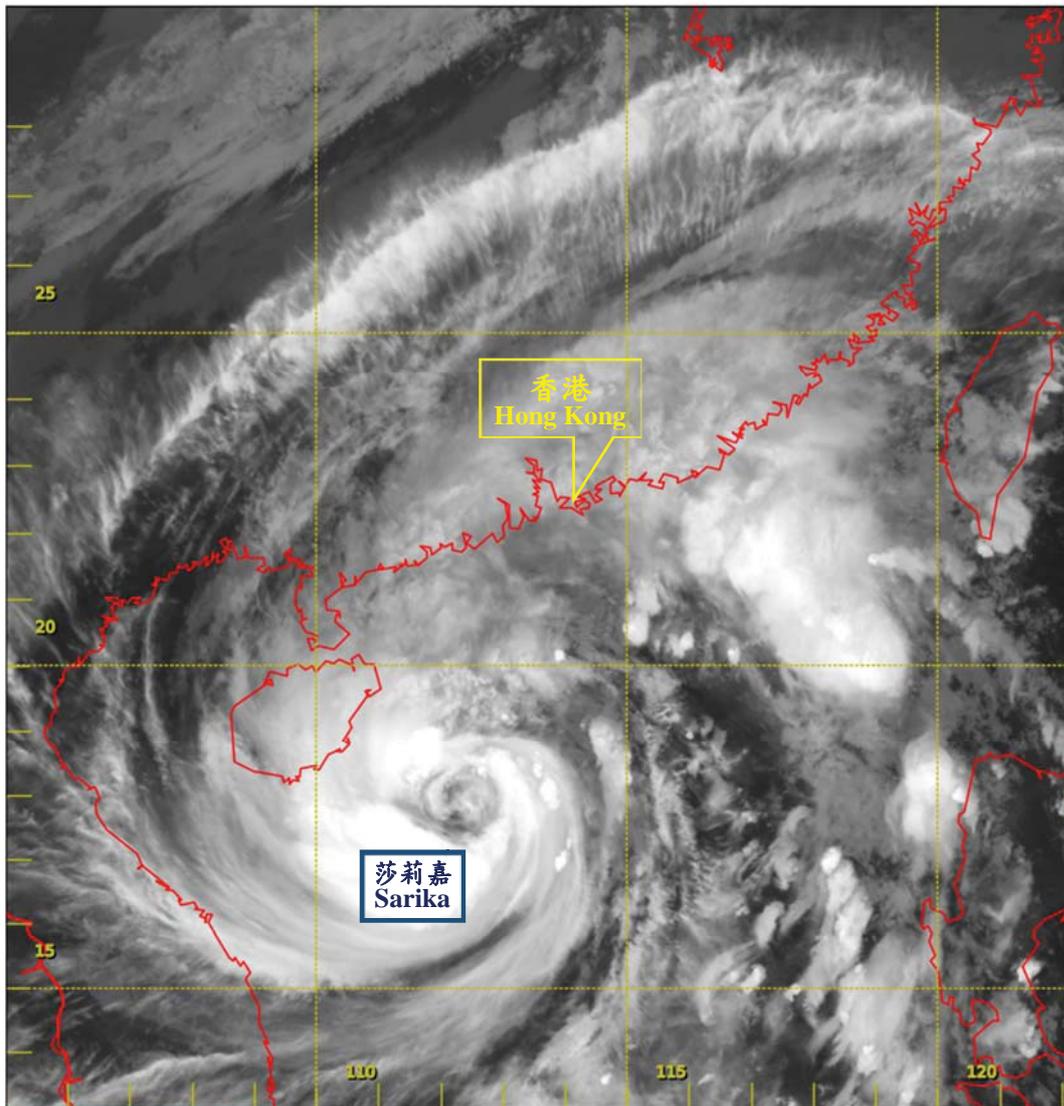


圖 3.8.3b 二零一六年十月十七日晚上 8 時左右的紅外線衛星圖片，當時莎莉嘉的中心附近最高持續風速估計為每小時 145 公里。

Figure 3.8.3b Infra-red satellite imagery around 8 p.m. on 17 October 2016 when The estimated maximum sustained winds of Sarika was 145 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).]

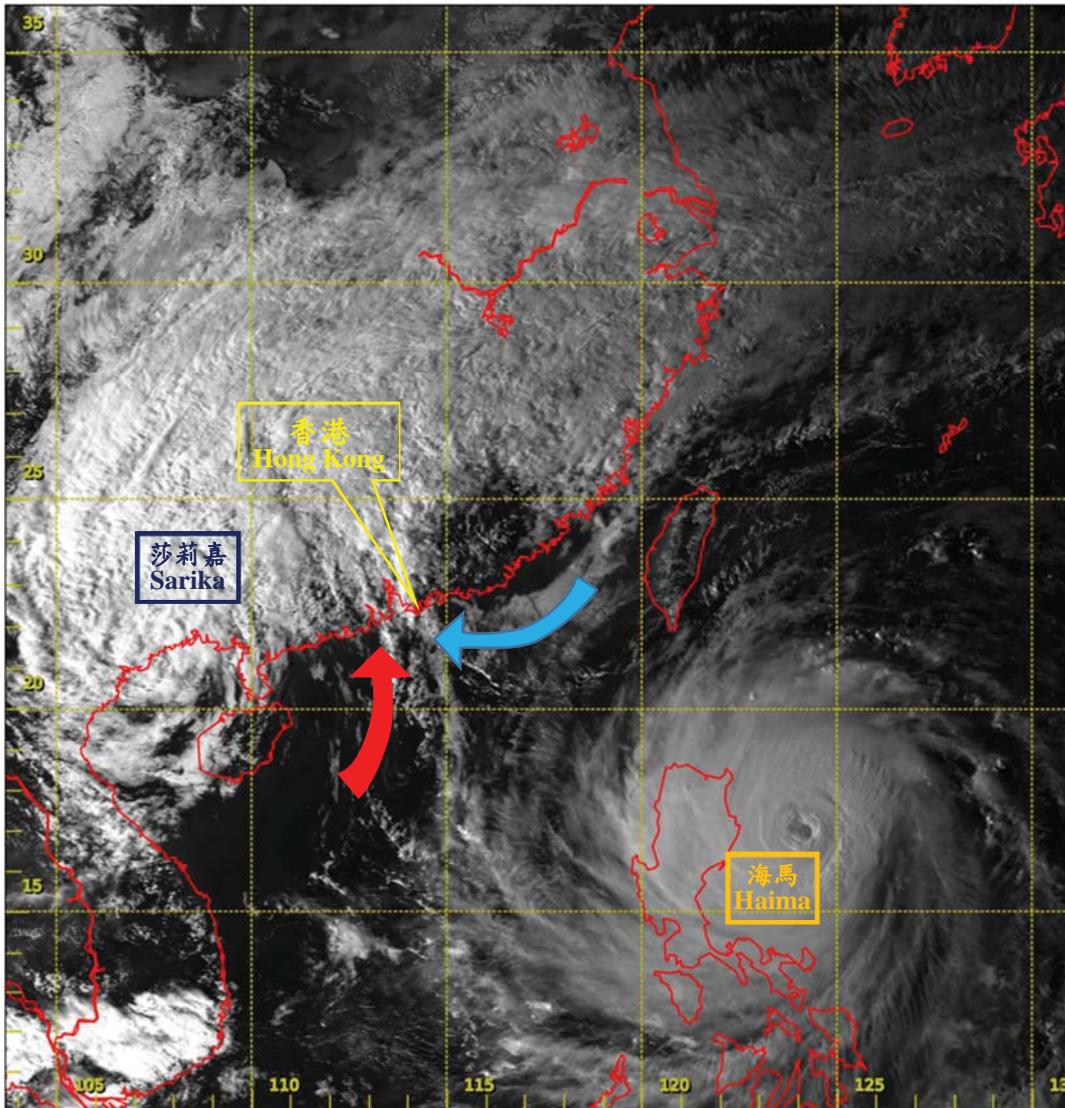


圖 3.8.3c 二零一六年十月十九日下午 4 時左右的可見光衛星圖片，當時莎莉嘉已在廣西內陸減弱為熱帶低氣壓，但其外圍偏南氣流(紅色箭咀)與東北季候風(藍色箭咀)的輻合引致香港附近有大雨和雷暴的發展。同時，位於北太平洋西部的超強颱風海馬正移向呂宋。

Figure 3.8.3c Visible satellite imagery around 4 p.m. on 19 October 2016. Sarika had already weakened into a tropical depression over inland Guangxi. However, the convergence between the southerly airstream associated with Sarika (arrow in red) and the northeast monsoon (arrow in blue) triggered heavy rain and thunderstorm development near Hong Kong. Meanwhile, Super Typhoon Haima over the western North Pacific was moving towards Luzon.

[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).]

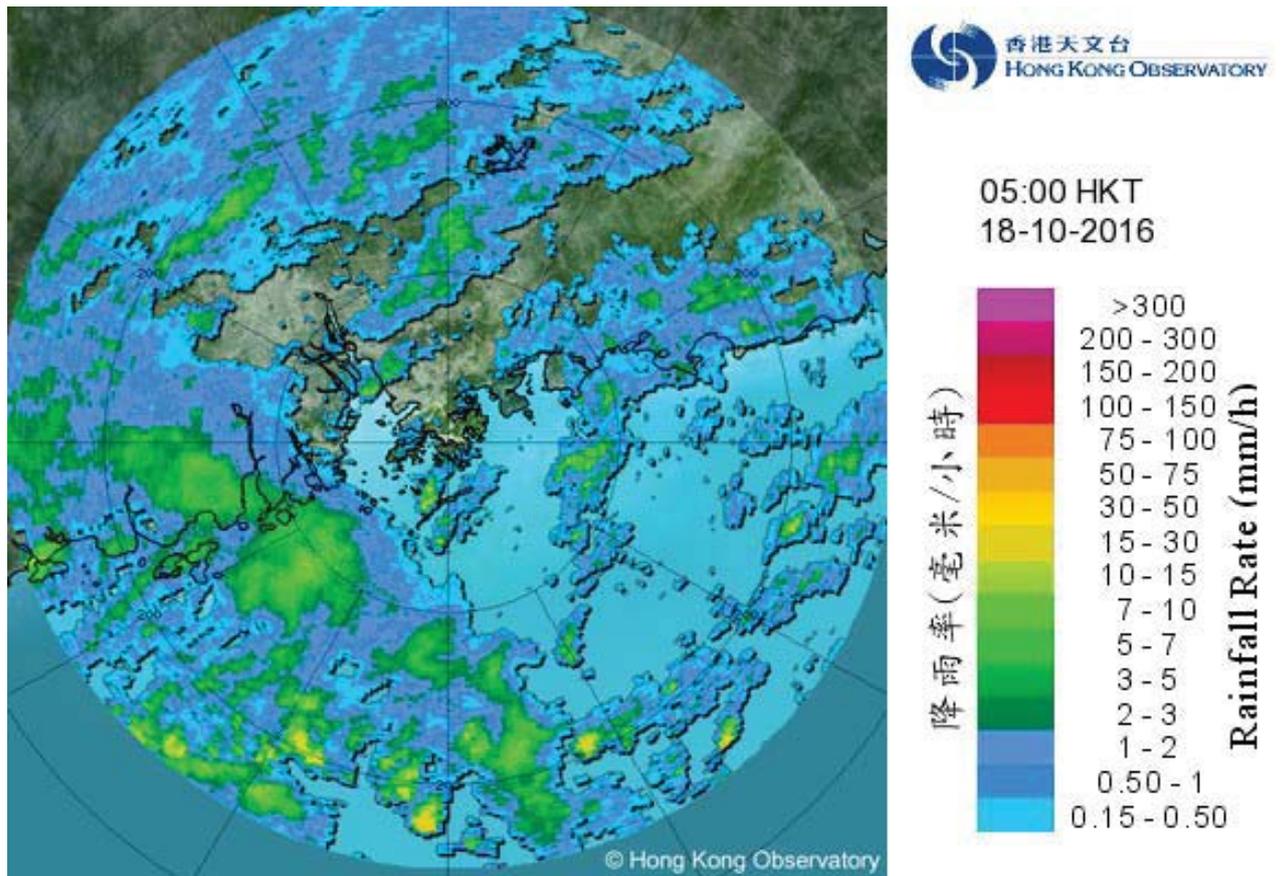


圖 3.8.4a 二零一六年十月十八日上午 5 時的雷達回波圖像，當時莎莉嘉最接近香港，位於本港之西南約 520 公里，其外圍雨帶正影響廣東沿岸及南海北部。

Figure 3.8.4a Radar echoes captured at 5 a.m. on 18 October 2016, when Sarika was closest to Hong Kong with its centre about 520 km to the southwest. The outer rainbands of Sarika were affecting the coast of Guangdong and the northern part of the South China Sea.

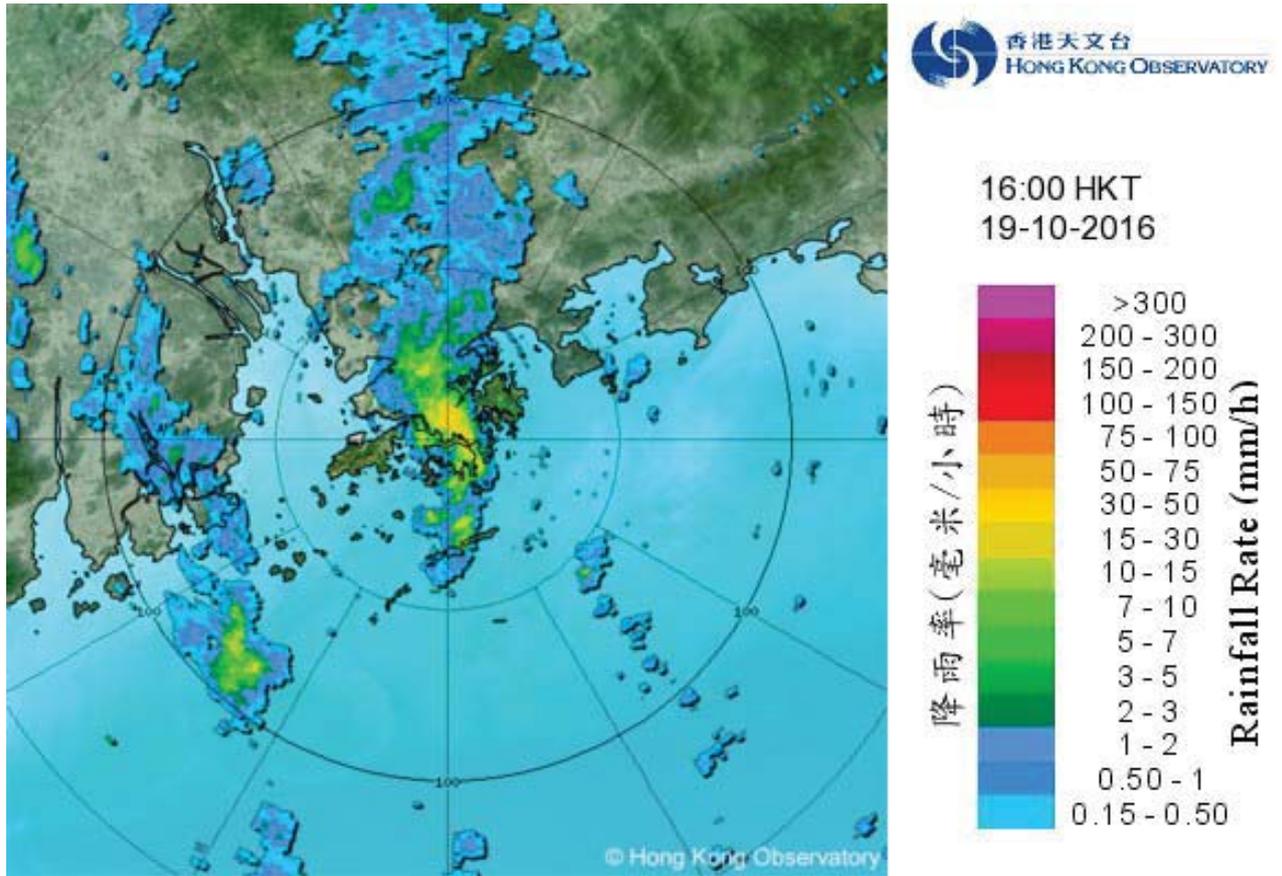


圖 3.8.4b 二零一六年十月十九日下午 4 時的雷達回波圖像，莎莉嘉的外圍偏南氣流與東北季候風的輻合引致香港附近有大雨和雷暴的發展。天文台需要發出黑色暴雨警告、山泥傾瀉警告、新界北部水浸特別報告及雷暴警告。

Figure 3.8.4b Radar echoes captured at 4 p.m. on 19 October 2016. The convergence between the southerly airstream associated with Sarika and the northeast monsoon triggered heavy rain and thunderstorm development near Hong Kong. Black Rainstorm Warning, Landslip Warning, Special Announcement on Flooding in Northern New Territories and Thunderstorm Warning were issued by the Observatory.



圖 3.8.5 二零一六年十月十九日在呈祥道(上)及柴灣道(下)的嚴重水浸。(鳴謝:渠務署)

Figure 3.8.5 Severe flooding at Ching Cheung Road (up) and Chai Wan Road (bottom) on 19 October 2016 (courtesy of Drainage Services Department).