

雷暴警告

Thunderstorm Warning



雷暴

雷暴是香港春季和夏季常見的天氣現象。從四月到九月，天文台平均每月有五至六日錄得雷暴。

大多數雷暴由積雨雲組成。每塊積雨雲覆蓋範圍一般直徑只有數公里，高度約十餘公里，遠看就如空中的一座塔。單塊積雨雲的壽命一般只有一兩小時。



在活躍天氣系統如低壓槽等附近，積雨雲可以連綿不絕地產生，雷暴影響的範圍較大及持久。有些積雨雲更會結合形成特大的強雷暴。

在夏天原本天晴的日子，日間太陽的熱力亦可能會激發積雨雲產生，形成雷暴。這些雷暴影響範圍較小及短暫，離雷暴不遠處可能仍是一片晴天。積雨雲有時會隨風飄移影響其他區域，積雨雲產生的地區也可能會隨時間而改變。

閃電和響雷是雷暴的特徵。在不穩定及潮濕的大氣中，雲層內的水滴及冰粒在對流活動中產生電荷。當電荷累積而形成的電壓過大時，雲與雲之間或雲與地之間就會出現閃電放電現象，放電通道周圍的空氣會急劇膨脹而產生隆隆雷聲。簡單來說，在看見閃電後三秒才聽到雷聲，表示雷暴距離觀察者約一公里，真正的距離依時間長短按比例計算。



大雨、閃電及狂風經常伴隨雷暴發生。突如其來的大雨，會對戶外活動人士構成危險。閃電可能對電力設施造成損毀，引起火警；又或因電殛導致人命傷亡。除直接電殛外，接觸受雷電影響的導體或電器，亦會因電震而受傷。雷暴中常出現狂風或猛烈陣風，風速驟然增強或風向突然改變。在本港及鄰近海域，

曾經有船隻因遇到雷暴的狂風而沉沒。另一方面雷暴狂風引致的風切變，亦對飛機升降的安全構成威脅。

在某些有利環境裡，雷暴可能伴有強勁的柱狀渦旋，以漏斗雲的形態出現，渦旋接觸地面時叫陸龍捲，接觸海面時叫水龍捲。渦旋中心附近的氣壓非常低，

並且風力強大。龍捲風經過時，單薄的建築物可能會抵受不住強大風力及室內室外的氣壓差而損毀，樹木及汽車等會被吹起。在海上曾經有小型船隻遇到水龍捲而沉沒。陸龍捲及登陸後的水龍捲都曾在香港對建築物造成破壞，雖然這種情況較為罕見。

雹是堅硬冰丸，通常直徑只有幾毫米，間中亦有較大的冰雹出現。雹在雷暴中充分發展的積雨雲內生成，主要在春天出現。較大的冰雹會破壞農作物，打破窗戶，溫室玻璃和汽車擋風玻璃。

龍捲風及雹暴在香港並不常見，平均每一至兩年才出現一次。



雷暴警告

天文台發出雷暴警告旨在提醒市民雷暴有可能在短時間內（一至數小時內）影響香港境內任何地方。警告發出後，警告信息會透過電台和電視台向市民廣播，亦會在天文台的網頁 (<http://www.weather.gov.hk>; <http://www.hko.gov.hk>) 及「打電話問天氣」系統 (1878200) 上發佈。

無論雷暴影響範圍廣泛或只涉及某一地區，天文台都會發出雷暴警告。如果雷暴在短時間內只影響某一地區，天文台會在雷暴警告中說明雷暴影響的區域，以提醒市民作出適當的安排。如果雷暴有可能持續一段較長時間或影響境內其他地區，天文台會延長雷暴警告。如果雷暴影響範圍廣泛或影響的地區不斷轉移，天文台會在雷暴警告中指出雷暴將影響本港而不會特別提及個別地區。

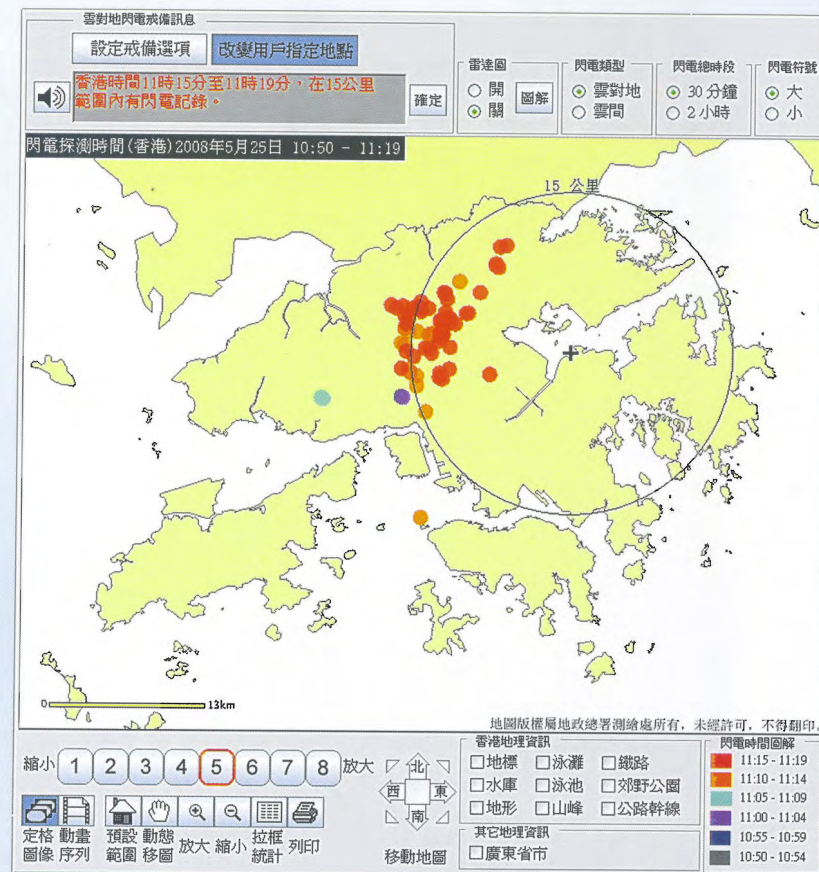
雷暴的發展、移動與消散可以非常迅速，也有可能只影響局部地區。雷暴警告的作用在於補充日常的天氣報告，促請市民特別留意預報中已有提到或事前未有預料的雷暴，以協助工程師、承建商及其他可能因雷暴而受影響的人士，並提醒有關政府部門及機構採取相應行動。

雷暴警告生效時，室外運動場、球場或泳池的管理人員及救生員應隨時留意天色的變化，以便向場地使用者及泳客作適當的指導。

閃電位置資訊

天文台與廣東省氣象局及澳門地球物理暨氣象局共同運作一套閃電定位網，二十四小時監測珠江三角洲的閃電活動。錄得的閃電位置會在天文台的網頁

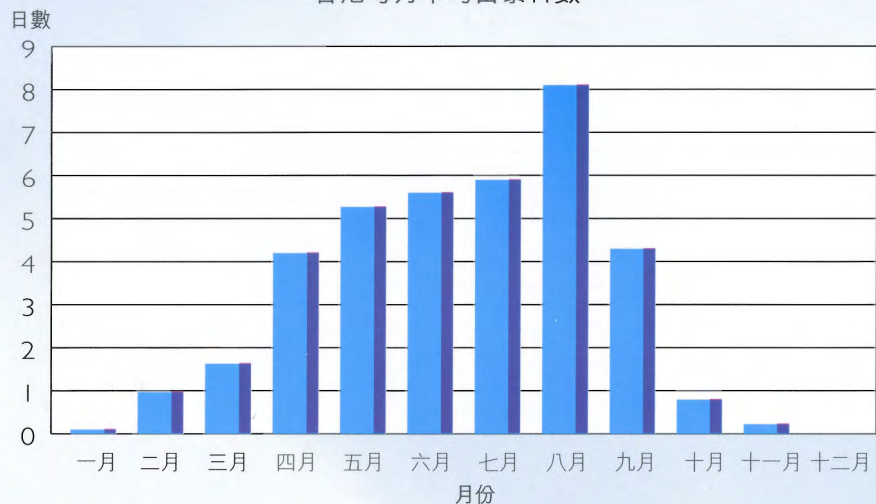
以圖像顯示，並會摘要地向電台、電視台公佈，以及在天文台「打電話問天氣」服務發佈。當雷暴警告生效時，市民可以利用閃電位置的資訊，以更好掌握雷電影響的地區。



天文台的網頁亦提供指定地點閃電戒備服務，市民可以在閃電地圖上選擇一個他們關心的地點，當特定範圍內錄得閃電，網頁便會自動發出影音戒備信號〔圖例的十字符號代表使用者選擇的地點，圓圈代表 15 公里半徑的戒備範圍〕。市民亦可以從四個預設的範圍，包括「新界西」、「新界東」、「大嶼山」及「港島及九龍」，選擇其中一個作為閃電戒備的區域。

市民在使用閃電資訊時，應同時參考天文台發出的雷暴警告、網上閃電/雷達拼圖和雨量分佈。

香港每月平均雷暴日數



雷暴中注意事項

- 留在室內。在室外工作的人，應躲入建築物內。
- 切勿游泳或進行其他水上運動。離開水面及找尋地方躲避。
- 避免使用電話或其他帶有插頭的電器，包括電腦等。
- 切勿接觸天線、水龍頭、水管、鐵絲網或其他類似金屬裝置。
- 避免用花灑淋浴。
- 切勿處理以開口容器盛載的易燃物品。
- 切勿站立於山頂上或接近導電性高的物體。樹木或桅杆容易被閃電擊中，應盡量遠離。閃電擊中物體後，電流會經地面傳開，因此不要躺在地上，潮濕地面尤其危險。應該蹲著並盡量減少與地面接觸的面積。
- 遠足及其他戶外活動人士，應隨身帶備收音機，不斷留意天文台發出的最新天氣消息。
- 留意暴雨可能隨時出現，切勿在河流、溪澗或低窪地區逗留。
- 駕車人士如駛經高速公路或天橋，應提防強勁陣風吹襲。
- 海上的小艇應小心提防狂風或水龍捲襲擊。
- 如遇上龍捲風，應立即躲入堅固的建築物內。要遠離窗戶、蹲伏在地上並用手或厚墊保護頭部。如在室外，應遠離樹木、汽車或其他可被龍捲風吹起的物件。

Thunderstorms

Thunderstorms commonly occur in spring and summer months in Hong Kong. On average, thunderstorms are reported at the Hong Kong Observatory in 5 to 6 days per month during April to September.

Most thunderstorms form in cumulonimbus cloud. A cumulonimbus cloud typically covers an area of a few kilometres in diameter with a vertical extent of ten kilometres or more, like a tower hanging in the sky. The typical life span of a cumulonimbus cloud is a couple of hours.



In the vicinity of active weather systems such as low pressure troughs, cumulonimbus clouds may form one after another. Such thunderstorms are more widespread and persistent. Occasionally, cumulonimbus clouds merge to form severe thunderstorms called supercells.

On a summer day that sets off with fine weather, insolation may trigger the growth of cumulonimbus clouds and the formation of thunderstorms. Such thunderstorms are often localized and short lived. The weather may even be sunny not far away from the storms. Sometimes, the cumulonimbus clouds will drift with the wind and affect other areas. The areas of formation of the clouds may also vary with time.



Thunderstorms are characterized by flashes of lightning and claps of thunder. In an unstable and moist atmosphere, water droplets and ice pellets in the cloud will become electrically charged in convective motion. When the electric field arising from the piling up of charges reaches a certain breakdown value, lightning discharges take place between clouds

or between cloud and the earth's surface. The explosive expansion of the surrounding air produces the rolling sound of thunder. As a rule of thumb, if the sound of thunder reaches an observer three seconds after a lightning flash, the thunderstorm is about one kilometre away from the observer. The distance of thunderstorms for different time delay of the thunder sound can be estimated similarly.

Heavy downpour, lightning and squalls often occur with thunderstorms. Outbreaks of heavy rain can be dangerous to people engaged in outdoor activities. Lightning can damage electrical installations, cause fire and kill by electrocution. Apart from direct strokes, people can also get hurt by electric shock when using or in contact with conductors or electrical appliances which come under the influence of these strokes. Squalls or violent gusts often occur with thunderstorms. They bring about abrupt increases in wind speed and drastic changes in wind direction. Boats are known to have capsized in thunderstorm related squalls in local and nearby waters. Wind shear associated with squall lines is also a potential hazard to aircraft during landing and take-off.



Under certain favourable conditions, thunderstorms are accompanied by tornadoes (over land) and waterspouts (over sea). They are intense columnar vortices in the shape of funnel clouds with very strong winds and very low pressure near the centre. During the passage of tornadoes or waterspouts, the direct impact of very strong winds and the difference in pressure between the interior and outside of a building can shatter weak structures, and even blow away trees and vehicles. There have been reports

of small boats capsizing in nearby waters on encountering waterspouts. Although much less frequent, tornadoes or waterspouts reaching the coast have caused damage to buildings in Hong Kong.

Hailstones are hard pellets of ice usually of only a few millimetres in diameter although larger stones occasionally occur. They are formed in well-developed cumulonimbus clouds associated with thunderstorms, mainly in spring. Large hailstones can damage crops, and break windows, glass houses and windscreens of cars.

Tornadoes, waterspouts and hailstorms are infrequent in Hong Kong. On average, there is one report of tornadoes or waterspouts every one to two years. The frequency of hailstorm occurrence is also about one every one to two years.



Thunderstorm Warning

Thunderstorm warnings issued by the Hong Kong Observatory are intended to give short-term (within one to a few hours) notice of the likelihood of thunderstorms affecting any part of Hong Kong. Once issued, the warning is broadcast over radio and television, and announced on the Observatory's website (<http://www.weather.gov.hk>; <http://www.hko.gov.hk>) and the Dial-a-Weather system (1878200).

Thunderstorm warnings are issued irrespective of whether thunderstorms are widespread or isolated. For isolated thunderstorms, the warning issued by the Observatory will indicate the regions that will be affected during the warning period to alert members of the public to take appropriate precautions. If thunderstorms are expected to persist or affect other parts of the territory, the warning will be extended. When thunderstorms are widespread or the areas being affected vary, it will be mentioned in the thunderstorm warning that Hong Kong will be affected by thunderstorms without specific reference to individual regions.



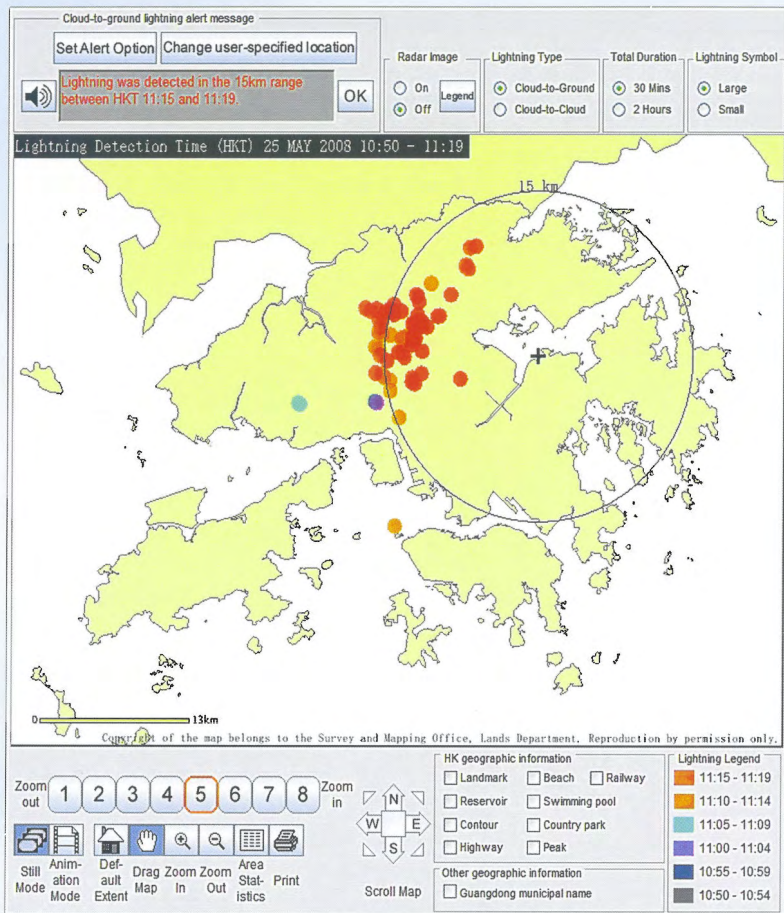
The development, movement and dissipation of thunderstorms can be quite rapid and fairly localized. Thunderstorm warnings supplement the forecast of thunderstorms in routine weather forecasts by drawing people's attention to thunderstorms that are about to or have already taken place, or to warn people of thunderstorms not previously expected. The warning is intended to assist engineers, contractors or other people who are likely to be affected by thunderstorms.

It also alerts relevant government departments and organizations to take appropriate actions.

While a thunderstorm warning is in force, managers of outdoor sports facilities, playgrounds or lifeguards at swimming pools should be vigilant about changes of the state of sky and give appropriate instructions to users of the facilities.

Lightning Location Information

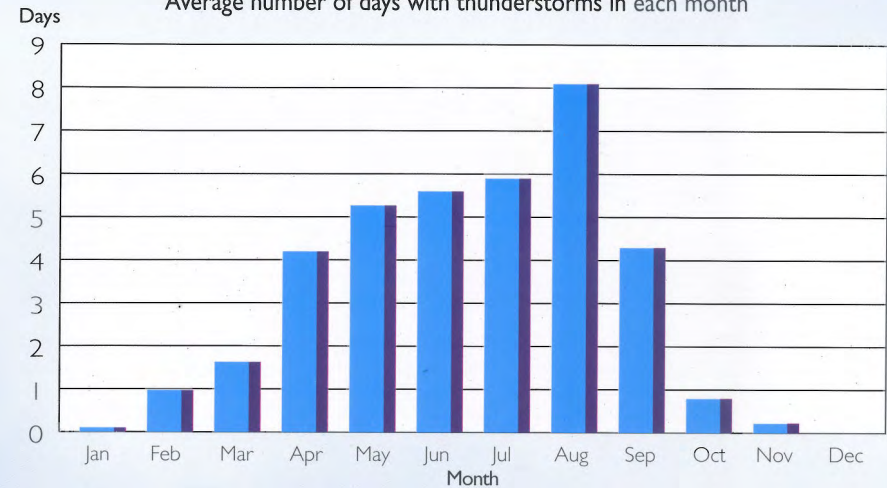
The Hong Kong Observatory, the Guangdong Meteorological Bureau and the Macao Meteorological and Geophysical Bureau jointly operate a lightning location network which monitors lightning activities over the Pearl River Estuary round the clock. The locations where lightning is detected are recorded and shown graphically on the Observatory's webpage. Brief lightning information is also made available to radio and television stations, and provided in the Observatory's Dial-a-Weather service. When the Thunderstorm Warning is in force, the lightning location information enables the public to better identify areas affected by the thunderstorms.



A location-specific lightning alerting service is also available on the Observatory's webpage. Members of the public may select their own location of interest and the webpage will automatically provide audio and visual alerts when lightning strokes are detected within a defined distance (The "+" symbol in the illustration denotes the location specified by the user and the circle denotes a 15 km-radius alert area). The public can also choose from four preset regions, namely "New Territories West", "New Territories East", "Lantau" and "Hong Kong Island and Kowloon", for automatic alerts.

When using the lightning location information, the public is advised to refer to the Thunderstorm Warning issued by the Observatory as well as integrated radar/lightning imageries and rainfall distribution available on the Observatory website.

Average number of days with thunderstorms in each month



Points to Note in Thunderstorms

- Stay indoors. Seek shelter in buildings if you are working outdoor.
- Do not swim or engage in other water sports. Leave the water and seek shelter.
- Avoid using telephone or other plugged-in electrical appliances, including computers.
- Do not touch aerials, water taps, pipes, wire fences and similar metal installations.
- Do not take shower.
- Do not handle inflammable materials in open containers.
- Do not stand on hill tops or near any highly conductive objects. Keep away from trees or masts which are likely to be struck by lightning. Since lightning current is conducted away through the ground, you should not lie down especially when the ground is wet. Instead you should crouch down to minimise the area in contact between you and the ground.
- Hikers and people engaging in outdoor activities should bring along their radios and listen to the latest weather information issued by the Observatory.
- Be alert to outbreaks of heavy rain. Stay away from river courses or low-lying areas.
- Drivers using highways and flyovers should be alert to intense gusts.
- People on small boats on the open sea should watch out for the approach of squalls or waterspouts.
- If you encounter a tornado, seek shelter in a sturdy building. Stay away from windows, crouch to the floor and protect your head with your arms or thick padding. In the outdoors, stay away from trees, cars and other things that can be blown up by the tornado.

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