## Warm Season Thunderstorm Characteristics over Taiwan Island

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Spatial and temporal distributions of thunderstorms in Taiwan in the absence of significant weather systems were analyzed and documented in this study by using radar reflectivity and lightning data from the warm seasons (May–October) of 2005–2008. Storm activities were found to be the most frequent during afternoon periods and strongly depended on geography and local circulations. Frequent afternoon thunderstorms were confined primarily to narrow zones over the slopes of mountain ranges, and the movement of the thunderstorms was closely related to the orientations of the mountain ranges in northern and southern Taiwan.

It is noted that sea breezes dominate the daytime boundary-layer wind patterns when no significant large-scale disturbances prevail. Pronounced diurnal variations were found in surface wind, temperature, and water vapor pressure fields, especially the latter. Surface water vapor pressures on days with afternoon thunderstorms (TSA days) were about 1–3 hPa higher than on days without thunderstorms (non-TSA days). Composite temperature and dew-point temperature from undisturbed days showed a relatively warmer (+0.5 °C) and moister (+1.0 °C) environment on TSA days than non-TSA days on the surface. Non-TSA days are drier than TSA days at all levels, with the largest differences of 1.5–4 °C in the lower to middle troposphere. Relatively humid southwesterly wind flows into the lower to middle troposphere to produce conditions suitable for less entrainment during the development of afternoon thunderstorms.