

## Characteristics of Air Quality in Taiwan Affected by Asian Dust Storms

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In each year, dust-storms triggered by cold air-masses passing through northern China and Mongolia enhance the PM<sub>10</sub> concentration over Taiwan region during winter and spring. On the average, there are 4.7 dust events and 6.5 dust days in a year observed in Taiwan. Each event lasts longer than one day. A procedure to identify a dust event is rationalized and exercised on data collected during 1994-2004. Also, a ranking method named as the dust intensity rank (DIR) has been developed to distinguish the intensity of each event on affecting the local air quality. About 86% of dust days belong to Ranks 1 and 2. In general, the higher the rank is, the higher the possibility to observe an unhealthy air quality condition. For Ranks 4 and 5, the chance to register PSI (Pollution Standard Index) larger than 100 is 100%. Linking DIR with the popular PSI is useful for both the public and the official forecasting system. It is also useful to inter-compare the dust influence on the air quality at different downstream regions in East Asia. In this paper, composite analyses of the temporal and spatial variation of PM<sub>10</sub> level indicate that dust particles usually arrive 12 hours before the peak PM<sub>10</sub> concentration occurring hour and can last for 36 hours at northern Taiwan, while due to the evolution of the synoptic weather system, the peak occurring hour at eastern or western Taiwan is about 3-12 hours late. It is noted that the increase of PM<sub>10</sub> level at western side of Taiwan is resulted from a mixture of local pollutants and upstream crustal inputs.

Keywords: Dust storm, air quality, Taiwan.