

## Special Program in Applied Mathematics and Applied Mechanics

*Air pollution “holiday effect” in Taiwan*

2014 - 05 - 07 (Wed.)

15:00 - 18:00

308, Mathematics Research Center Building (ori. New Math. Bldg.)

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The spatio-temporal characteristics of the “holiday effect”, defined as the difference in air pollutant concentrations between the holiday (Chinese New Year) and non-holiday periods during 1994-2008, and its association with the degree of urbanization in Taiwan are examined. Daily surface measurements of six major pollutants from 54 monitoring stations of the Taiwan Environmental Protection Administration are used. Holiday effects are found for almost all air pollutants in all divisions and individual stations. A widespread holiday effect with consistent signs suggests a high degree of urbanization over Taiwan. Holiday effects are stronger in the west than in the east, due to urban-rural differences, and have a distinct north-south difference in the west, due to different emission sources. In the spatial distribution, as the population (motor vehicle) number in the division increases, holiday effects of NO<sub>x</sub>, CO and NMHC are intensified. Holiday effects of pollutants can also be stronger when the associated dominant anthropogenic sources in the division have larger emissions. Both imply the association of a stronger holiday effect with a higher degree of urbanization in the division. In the temporal variation, on the other hand, holiday effects and pollutant concentrations tend to weaken and reduce in almost all the urban divisions for all six pollutants except O<sub>3</sub>. These weakening trends imply possible contributions of other effects, such as the mature state of urbanization for the urban division, the effective pollution-control measures and behavioral pattern changes.

Keywords: holiday effect; weekend effect; degree of urbanization; anthropogenic source; sector emission; industrial development.



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