Temporal common trends of ambient pollutants at four supersites in Kaohsiung, Taiwan

Yi-Ming Kuo (1), Sheng-Wei Wang (2), and Hwa-Lung Yu (2)

(1) Department of Design for Sustainable Environment, Ming Dao University. Chang-Hua, Taiwan, R.O.C.
(airkuo@ntu.edu.tw), (2) Dept of Bioenvironmental Systems Engineering, National Taiwan University, Taipei, Taiwan

The concentrations and characteristics of the major components in ambient fine particles in the urban city of Kaohsiung (Taiwan) were measured. Particulate matters (PM2.5) have been found to be associated with urban health problems. Studies investigating the PM compositions are rapidly emerging recently to reveal direct evidence of the impact to human health rather than only using PM measures. Dynamic factor analysis (DFA), a dimension reduction technique that considers the time component for studying multivariate time series, is adopted to obtain underlying common trends of response time series and influences of explanatory variables. This study investigates the temporal patterns of the observations of ambient pollutants at four supersites to obtain the most significant common trends, which are the trends of a group of ambient pollutants. The common trends are uncorrelated to each other and may represent an important contributing mechanism to the local spatiotemporal distribution of air quality.