

The validity of the estimation of ozone origin by sectoral air mass classification verified with tracer-tagging simulation

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The air quality in East Asia has changed rapidly in recent years, especially region-wide transboundary air pollution is the main issue in the atmospheric environment in this region. Therefore, the solution to this issue is of great importance today in East Asia, and the scientific understanding of the structure about this region-wide scale air pollution is necessary. The sectoral air mass classification method has been used to estimate the origin of air pollutants in East Asia, and demonstrated the characteristics of air mass with different origins and extended the understanding of the structure of air pollution. However, this method has a problem to erroneously estimate the origin of air pollutant due to the simpleness of the method. Here, we validate of the estimation of ozone origin by sectoral air mass classification by using the tracer-tagging simulation done by a global chemical transport model (CTM). The analysis suggested that the origin of ozone estimated by these two different methods (sectoral air mass classification and tracer-tagging) generally agreed with each other in the warm season, but the two differ significantly in the cold season. The results suggested that the sectoral air mass classification method should consider the different threshold of residence time to separate the air mass into different origins.