

3.023 Air pollution over the North China Plain and its implication of regional transport: A new sight from the observed evidences.

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Abstract:

High concentrations of the fine particles (PM_{2.5}) are frequently observed during all seasons over the North China Plain (NCP) region in recent years. In NCP, the contributions of regional transports to certain area, e.g. Beijing city, are often discussed and estimated by models when considering an effective air pollution controlling strategy. In this study, we selected three sites from southwest to northeast in NCP, in which the concentrations of air pollutants displayed a multi-step decreasing trend in space. An approach based on the measurement results at these sites has been developed to calculate the relative contributions of the minimal local emission (MinLEC) and the maximum regional transport (MaxRTC) to the air pollutants (e.g., SO₂, NO₂, CO, PM_{2.5}) in Beijing. The minimal influence of local emission is estimated by the difference of the air pollutants' concentrations between urban and rural areas under the assumption of a similar influence of regional transport. Therefore, it's convenient to estimate the contributions of local emission from regional transport based on the selective measurement results instead of the complex numerical model simulation. For the whole year of 2013, the averaged contributions of MinLEC (MaxRTC) for NO₂, SO₂, PM_{2.5} and CO are 61.7% (30.7%), 46.6% (48%), 52.1% (40.2%) and 35.8% (45.5%), respectively. The diurnal variation of MaxRTC for SO₂, PM_{2.5} and CO shows an increased pattern during the afternoon and reached a peak (more than 50%) around 18:00, which indicates that the regional transport is the important role for the daytime air pollution in Beijing.