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Quantitative recognition of PLAM index on impacts of emissions and meteorological conditions to the "93 Beijing Blue"

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Emissions and meteorological conditions are two important factors for local impacts on aerosol cumulative or dilution. Identifying the respective contribution both of emission reduction and of meteorological conditions on aerosol pollution abatement, and consequently to give the objective assessing for contribution of emission reduction measures is recently a focus of scientific problems. This paper focuses on studying of objective assessment for the air quality improvements (known as "93 Beijing blue") due to emission reduction measures relative to the period of Beijing parade for 70 anniversary of victory of the anti-Japanese war and world anti-fascist war related during September 3, 2015. The study proposed identifying objective quantitative algorithm in the contribution of emission reduction measures. Based on pollution meteorological conditions -PLAM index, the assessment and verification of emission-reducing contribution are given respectively during the special period from August 20 to September 3, 2015, which are corresponding to an average change rate algorithm and a parameter fitting method developed in the study. Results showed that from 20 August to 3rd September for motor vehicle emission-reducing such as odd runs in Beijing, the contributions for "Beijing Blue" is up to 26∼30%, where September 1- 3rd contribution of special comprehensive emission-reducing with a peak of 45% for a short-time. 70% of the other contributions are from the long period of favorable weather conditions. By the analyzing of circulation anomaly for the period 20 August up to 3rd September 2015 with the 30 year's average of historical atmospheric circulation and also the analyzing of real-time information in 3rd September 2015 revealed that the "North China cold Vortex", as an unusual stable circulation system stagnation, provides favorable weather conditions for the formation of the fall of 2015 "Beijing Blue".