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Variation Characteristics of $PM_{2.5}$ and PM_{10} Concentration and its Driving Factors in the Yangtze River Economic Belt

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Studying the changes of $PM_{2.5}$ and PM_{10} in the Yangtze River Economic Belt will help promote the comprehensive management of regional air pollution and promote the ecological environment protection and high-quality economic development of the Yangtze River Economic Belt. This paper selects monthly observation data of six pollutants from 126 cities in the Yangtze River Economic Belt from 2015 to 2020, and applies Mann-Kendall mutation test, Pearson correlation coefficient analysis, spatial autocorrelation analysis and spatial regression analysis to study $PM_{2.5}$ and PM_{10} temporal and spatial distribution, evolution characteristic and driving factors, and applies the HYSPLIT backward trajectory analysis model to study the potential impact of long-distance air transport and atmospheric boundary layer conditions on the diffusion and transmission of $PM_{2.5}$ and PM_{10} pollution sources in the Yangtze River Economic Belt. The annual average concentrations of $PM_{2.5}$ and PM_{10} in the Yangtze River Economic Belt significantly decreased year by year, with obvious seasonal trend of high concentration in winter and low concentration in summer. There is a significant positive spatial correlation relationship, and the spatial accumulation is obvious. In addition, there is a significant positive correlation and homology with other gaseous pollutants. The air mass retrospective direction and atmospheric boundary layer conditions of the upper, middle and lower Yangtze River urban agglomerations have different effects on $PM_{2.5}$ and PM_{10}. The regional GDP, the proportion of the secondary industry, the population density and the green coverage rate in the built-up areas all affected positively the local $PM_{2.5}$ and PM_{10} concentrations. Overall, regional cooperating depollution, synergetic reduction of various air pollutants and transformation of economic development patterns can fundamentally solve the problems of $PM_{2.5}$ and PM_{10} pollution in the Yangtze River Economic Belt.