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STUDY ON PREDICTION MODEL OF SPACE-TIME DISTRIBUTION OF AIR POLLUTANTS BASED ON ARTIFICIAL NEURAL NETWORK

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Abstract

Along with the development of industrialization and urbanization, the pollution gas in the atmosphere increases and the air quality decreases gradually, especially in the developed regions such as Beijing, Tianjin and Hebei in China. The frequent occurrence of haze leads to the decrease of visibility day by day, which causes great inconvenience to people's mind and body. Therefore, an in-depth study of regional weather quality impact factors can improve the air quality in the regions, which is of important significance to haze warning. This study mainly explores the main causes of haze formation and forecasts the haze, and puts forward some suggestions on haze control. This study proposes a space-time prediction model of air pollutants based on artificial neural network. The selected research regions are cities in Beijing-Tianjin-Hebei region. The data are real-time daily data of monitoring stations published by Beijing Environmental Protection Monitoring Center and China Meteorological Administration, and the air environment changes of 13 cities in Beijing-Tianjin-Hebei region in 2017 are studied. The impact factors include $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO and O_3. Through collecting and visualizing the data, evaluating with air quality index (AQI), this study designs, establishes, trains, and simulates the backpropagation neural network, adjusts the corresponding parameters, obtains the optimal model and the main research conclusion, as well as provides scientific reasonable suggestion.

Key words: air pollutants, backpropagation neural network, $PM_{2.5}$, space-time distribution

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