Geoscientific
Model Development
Discussions

Interactive comment on "PM2.5 / PM10 Ratio Prediction Based on a Long Short-term Memory Neural Network in Wuhan, China" *by* Xueling Wu et al.

Anonymous Referee #1

Received and published: 4 September 2019

Reviewers' comments: The manuscript "PM2.5/PM10 Ratio Prediction Based on a Long Short-term Memory Neural Network in Wuhan, China" aims at improving the accuracy and spatio-temporal applicability of PM2.5/PM10 by using long short-term memory (LSTM) neural network method based on the corrected AOD, meteorological data and gaseous pollutant data in Wuhan. The results showed that the LSTM model had significant advantages compared with the results of the four other intelligent models. This is a very interesting study. However, there are some problems need to be revised very carefully. For now, it cannot be accepted. Abstract: The MODIS first appeared in keywords, so Moderate Resolution Imaging Spectroradiometer should provide abbreviations in the abstract. Introduction 1. The introduction needs significant improvement.

Please following the state of the paper, which is nor presented well in this paper. Why do authors want to conduct this study? What is the significance of this research? The introduction only introduced the research status, advantages of methods and models, and research purposes, but does not specify the significance of this study. 2. In the introduction, you described PM10 and PM2.5. Why does the paper only point out aerodynamic particle size of PM2.5, but not PM10? 3. PM10 is primarily produced by natural processes, such as resuspending local soils, sandstorms, and roadside dust, and various industrial processes. This sentence need significant improvement. PM10 is not only derived from natural processes, but also from anthropogenic emissions. In addition, were the roadside dust and various industrial processes generated by natural processes? 4. In the lines 30-31, "are particularly important for environmental policy and public health research". What does this sentence focus on? Anthropogenic combustion products? Please revise carefully. 5. In the lines 36-38, this sentence lacks the reference. Some other sentences lacking references in the introduction. Please check them carefully. Besides, some references are too old in the introduction. 6. "Many statistical models have been used for the ground PM estimation of AOD and other predictors, such as linear regression models, random forest models, neural network models, and generalized additive models." In this sentence, each model should be added with the corresponding reference. 7. Overall, the introduction is too long. Because the introduction does not mean the stack of the references, such as the lines 78-81, and there are similar problems in some sentences in the introduction. In addition, there is a suggestion that the second and third paragraphs should be selectively integrated. Methods: 1. In the line 141, why do gaseous pollutants exist subscripts and particulate matter do not? 2. In the lines 143-162 of the section 3.2, are the sources of the gaseous pollutants described in this section the results generated by authors? If not, please add the references to support your statements. 3. In section 3.3, a total of 5 meteorological stations exist near the Wuhan area. Are there too few stations for interpolation? Please provide parameters to prove that the spherical model of the kriging method used in the paper is reasonable. 4. Sections 3 and section 4 are methods,

and they should be integrated together. Results and discussion Results and discussion section, it reads like just the results and there is little discussion. It is suggested that this paper should be compared with other articles on neural network models to ensure the credibility and stability of the results.

C3