

Comments

Due to the emission uncertainties in air quality modeling prediction, the development of air quality diagnostic prediction method could be practical based on the understanding of the physical connection of meteorological parameters to air quality change. Therefore, the establishment and application of PLAM/h Index (Parameter Linking Air-quality to Meteorological conditions/haze) in this paper are of considerable interest. For the benefit of the reader, however, a number of points need clarifying and certain statements require further justification.

Major comments:

- 1) With modifying the initial meteorological PLAM (Wang et. al., 2012) with the 2010 PM_{2.5} emission data, a new parameter PLAM/h is developed for haze forecast. Please note that a) these PM_{2.5} emission data provide only the primary emission, and the secondary aerosol particles contribute more than half PM_{2.5} to haze formation in China. This contribution of secondary aerosols with their precursor emission should be considered into the PLAM/h development;
- 2) To quantify the impact of emission in PLAM index, the probability of its impact on the surrounding area are isotropic in the section 2.3, which is discussible, because the pollutant emissions could influence on the downstream area driven by winds (not all the surrounding areas).
- 3) Based on the Figure 2, the two regression lines of PLAM and PLAM/h (see the following Fig.) present less differences in visibility prediction, especially for haze (Vis. <10km).



- 4) This paper uses the near real-time (NRT) operational data, including surface observation data. Please clarify the NRT data, which are the modeling forecast data or observation data. How can these data be used to 24h forecast?
- 5) The English language should be substantially improved. For example, please use “haze” to replace and correct “atmospheric fog-haze”, “fog-haze” “visibility fog-haze”, all of which are Chinese English “haze”.

Specific comments:

- 1) In this paper, the coefficient of determination R^2 is used in analyzing correlation between visibility and PLAM Index. It can not be called the correlation coefficient. The correlation coefficient is R. (line 24,223,315,371,387,423...)
- 2) The correlation fitted lines of PLAM index value without emission are marked by yellow dashed line instead of “black dashed line” . (line 220)
- 3) According to Fig. 4a, when $PLAM < 100$, visibility is not less than 10 km, but larger than 10 km. (line 323)
- 4) In Fig. 5, R^2 is always less than 1, so the value of the figure should be between 0-1, but not between 0-100.

- 5) There are a few errors in the details. In the line 273, “according to Fig.3g and 3h..” should become “according to Figs.3e and 3f” ; in the line 615, “...PLAM/h (g) and visibility (h) on 7 January 2011”should become “...PLAM/h (g) and visibility (h) on 7 January 2013”.
- 6) Please check the citation list and delete the unused citation in the references.