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Interactive comment

Interactive comment on "Meteorological controls on atmospheric particulate pollution during hazard reduction burns" *by* Giovanni Di Virgilio et al.

Anonymous Referee #3

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This paper use the a generalized additive mixed modelling (GAMM) method to find the 9 out of 16 selected meteorological and date variables, e.g. PBLH, total cloud cover, wind speed and temperature etc, which have more influence to PM2.5 variation induced by hazard reduction burns (HRB) in Sydney, Australia. The paper has more technique part than the scientific significance although it has clear method description and organized well. However, my concern is that some result figures can not support enough on the conclusion about the relationship between PM2.5 emission and meteorological variables. For example, the Chullora Low and Earlwood Low in figure 5 show very scattered partial residuals, even though the fitted curves can be conducted anyway and show trends, but the confidence on these trends is kind of low. The similar

scattered PM2.5 plots are found in figures 6-13 as well. I wonder if other function selected for GAMM can make better simulations, please see more detail in my question 2.

More questions are listed following: 1, at line 97, author includes many meteorological variables in analysis. Does any influence come from ocean variables? such as sea surface temperature, ENSO etc.

2, at line 155, author choose an identity link function in GAMM. However a log link function seem more suitable for the nonlinear relationship between air quality and meteorological variables.

3, at line 169, is lag in days or months in Figure S1?

4, at line 188, is median value of PM2.5 calculated by HRB days or the whole year? I prefer to use all days instead of only HRB days.

5, at line 199, how is definition of a threshold of 3.5 here?

6, at line 204 and 206, why is 300km a maximum burn distance instead of 500km?

7, at line 220, figure 3 show increasing trends in all season after 2011. Author also mentioned that the new instruments had been used to measure PM2.5 concentration since 2012. Does the instrument change contribute the increasing trend?

8, at line 223, figure 4a show PM2.5 is lower in Spring than other seasons, but figure 3 does now show PM2.5 lower in Spring. Any explanation?

9, at line 224, what reason is the PM2.5 higher in weekend while other pulltants get lower?

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