Response to Anonymous Referee #3

We appreciate your valuable comments and suggestion, which significantly improved the manuscript. We carefully answered them point-by-point as below and improved the corresponding parts in the manuscript.

Reviewer's comments are in plain face.

Author's responses are in blue color.

Changes in the manuscript are in red color.

Reviewer's comments

I recommend this manuscript be published after some reversions listed as following.

(1) We often believe the coarse PM ($PM_{2.5-10}$) contributed from vehicles and road dust could probably be crustal dust (almost 18 μg/m^3 estimated from Figure 4). Since silicon was measured, please state it is true by using the chemical composition. Also, distinguishing the it from the construction dust is needed.

Response: We have made some explanations on this problem in the text. One is that the source profiles of the motor vehicle/road dust and construction sources are different. The other is the motor vehicle and construction sources showed distinct time-variation/diurnal concentration patterns from the PMF results (Figure 5, 6, 7). We added more information on this problem.

Page 10: "Motor vehicles and road dust were identified as the source of the second factor based on the presence of NO_2, BC and crustal matter components Al, Si, Ca, Fe and Zn from the coarse fraction as the significant elements in the profile. This profile represents both exhaust (tailpipe) emissions and non-exhaust (road dust and brake and tire wear) emissions, hence the combination of coarse and fine elemental species and the higher contribution of the source to PM_{10} concentrations relative to $PM_{2.5}$. Ambient source profiles derived for motor vehicles generally include particulate matter from all engine types as emissions tend to be co-mingled by turbulent air movement at street level due to road traffic and are therefore temporally and spatially covariant (Amato et al., 2009; Pant and Harrison, 2013)."

Page 11: "The fifth factor, construction dust, with a high Ca loading in the profile along with crustal matter components (Al, Si, Fe) in both the fine and coarse fractions

has been attributed to activities that generate cementitious (hence the high Ca content) and crustal matter dusts in the area such as construction/demolition of buildings and other structures (i.e. cement mixing, concrete pouring, concrete cutting or drilling, and soil excavation), which significantly distinguishes the source from that which might be associated with motor vehicle/road dust emissions (Owega et al., 2004; Chueinta et al., 2000; Maenhaut, 2017)."

Page 13: The construction dust concentrations (Fig. 7b) were significantly higher during the day reflecting the pattern of day-time activities generating the dusts. The motor vehicles and road dust source (Fig. 7c) showed a bimodal pattern with peaks in the morning and evening rush hours, which ascribed to the morning and evening commuter traffics and lower boundary layer. We could see the distinguishing diurnal variations between motor vehicles/road dust and construction dust sources.

(2) The author insisted coal consumption was dominated by industry, some words are necessary to exclude the power plants in PRD.

Response: Actually, we simply state that this source was likely to be due to coal combustion mixed with industrial emissions so that coal-fired power stations are not specifically excluded - additional wording inserted in **page 11, lines 8-9:**

"The third source contains most of the black carbon, a substantial amount of CO, SO_2, NO_2, S and fine fraction heavy metals (Cr, Mn, Cu, Zn, As, Pb) and has been attributed to coal combustion which is likely to include coal-fired power station emissions that are probably mixed with industrial process emissions (Song et al., 2007; Tian et al., 2014)."

(3) Some words are needed to tell the readers know how the authors chose the best results from PMF rotation runs.

Response: Thank you. New sentences were added in the **section 3.2, lines 11-15:**

"Multiple PMF model runs were performed choosing fewer and more factors to examine the effect on modelling diagnostics and interpretability of the source profiles coupled with the advantage of high-resolution data to examine the diurnal concentration variations. The final six-factor solution adopted included an FPEAK rotation (-3, %dQ(Robust) = 2.91) that provided a good separation of the minor marine aerosol source as evidenced by the FPEAK Bootstrapping results."