

Comments to the author:

The authors have reasonably addressed the comments of the two anonymous referees. However, the manuscript has major shortcomings. It suffers from poor language and grammar. I tried to improve on this, see under Alterations and Corrections below, but additional improvement is desirable. Furthermore, the manuscript is on various occasions unclear. Moreover, verbs are often used with the past tense where the present tense would be more appropriate. Major revision is definitely needed before this manuscript could become acceptable for publication.

Response: Thank for reviewer's suggestions. We have revised the manuscript based on the reviewer's suggestions carefully.

Alterations, Corrections and Comments for the Main text:

Comment 1: Line 9: Replace "energy conservation and environmental protection" by "Energy Conservation and Environmental Protection".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 2: Line 18: Just one example of using improper tense, replace "remained" by "remains".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 3: Line 38: Replace "the persistent" by "persistent".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 4: Line 39: Replace "the massive" by "massive".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 5: Lines 41, 254, and 466: Replace "threaten" by "threat".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 6: Line 42: Replace "physiochemical" by "physicochemical".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 7: Lines 55 and 529: Replace "controls measures" by "control measures".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 8: Line 60: Replace "mountain" by "mountainous" and replace "the filter sampling" by "filter sampling".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 9: Line 61: Replace "technique coupled" by "coupled".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 10: Line 64: Replace "many valuable" by "much valuable".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 11: Line 70: Replace "the receptor models" by "receptor models".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 12: Line 78: Replace "analyze hourly" by "measure hourly" and replace "work, A." by "work,".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 13: Line 81: Replace "used Xact" by "used the Xact".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 14: Line 83: Replace "performed in" by "employed in".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 15: Line 85: Replace "found traffic" by "found that traffic".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 16: Line 87: Replace "1-year atmospheric elements" by "atmospheric elements during a

full year".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 17: Line 88: Replace "considered as the" by "the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 18: Line 93: Replace "Chinese government proposed" by "the Chinese government proposed a".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 19: Line 94: Replace "suffered from" by "showed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 20: Line 96: Replace "the rapid changes response" by "rapid changes due".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 21: Lines 99-100: It is unclear what is meant by "population-weighted mean concentrations".

Response: Thank for reviewer's suggestions. The population-weighted mean concentrations represent the average air pollutant exposure concentration considering the impact of population. For instance, China could be classified into 49400 grids with spatial resolution of 0.25°. The population-weighted air pollutant concentration was estimated based on the following equation:

$$C = \frac{\sum_{i=1}^n C_i \times P_i}{\sum_{i=1}^n P_i}$$

where C is the population-weighted air pollutant concentration; C_i means the air pollutant level in each grid, P_i means the population in each grid.

Comment 22: Line 101: Replace "respectively during" by "respectively, during".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 23: Line 105: Replace "of clean" by "of the clean".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 24: Line 113: Replace "in North" by "in the North".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 25: Line 120: Replace "for coal-fired" by "for the coal-fired".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 26: Line 121: Replace "coal to" by "the coal to".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 27: Line 122: Replace "suffered from" by "underwent".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 28: Line 126: Replace "China during" by "China, during".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 29: Line 136: Replace "including Airport" by "including the Airport".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 30: Line 139: Replace "Beihu" by "the Beihu".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 31: Line 142: Replace "of large" by "of the large".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 32: Line 143: Replace "focus on" by "focus on the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 33: Lines 146-148: I understand from line 515 that the measurement was done continuously; therefore, replace "were determined" by "were determined continuously".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 34: Line 151: Replace "detect the" by "determine the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 35: Line 154: Replace "of online" by "of the online".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 36: Line 161: Replace "the particulate" by "a particulate".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 37: Line 173: Replace "All of trace" by "All trace".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 38: Line 178: Replace "the remained" by "the remaining".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 39: Line 179: Replace "of trace" by "of the trace".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 40: Line 181: Replace "of original element concentrations and deweathered" by "between the original element concentrations and the deweathered".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 41: Line 185: Replace "be the unconvincing" by "be an unconvincing".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 42: Line 191: Replace "PMF 5.0" by "the PMF 5.0"; furthermore, a literature reference is needed here; an appropriate one is: Norris, G., Duvall, R., Brown, S., and Bai, S.: EPA positive matrix factorization (PMF) 5.0 fundamentals and user guide. U.S. Environmental Protection Agency Office of Research and Development, Washington, DC, 20460 (i-124, EPA/600/R-14/108, April), 2014.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 43: Line 192: Replace "of atmospheric" by "of the atmospheric".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 44: Line 194: Replace "between measured" by "between the measured".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 45: Line 195: Replace "contribution and factor profile" by "contributions and factor profiles".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 46: Line 196: Replace "for individual" by "for an individual".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 47: Line 202: Replace "of jth" by "of the jth".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 48: Line 203: Replace "of kth source to ith sample, fkj represents the ratio of jth element in kth" by "of the kth source to the ith sample, fkj represents the ratio of the jth element in the kth".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 49: Line 204: Replace "of jth element in the i sample" by "of the jth element in the ith sample".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 50: Line 205: Replace "including bootstraps" by "including the bootstrap".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 51: Line 218: Replace "by International" by "by the International".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 52: Line 219: Replace "of IARC" by "of the IARC".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 53: Line 220: Replace "meatal" by "metal".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 54: Lines 226-230: The units should be indicated for InhR, ED, BW, AT, ADD, RfD, the reference concentrations, and CSF.

Response: Thank for reviewer's suggestions. We have added the units in the revised version.

Comment 55: Line 237: A median value does not have a single associated uncertainty; is it perhaps the mean value and associated standard deviation here?

Response: Thank for reviewer's suggestions. They are mean value and associated standard deviation.

Comment 56: Lines 241-245, and further on: When data with associated uncertainties are give, what are they? Perhaps the mean value and associated standard deviation? In any case, it should be specified.

Response: Thank for reviewer's suggestions. They are mean value and associated standard deviation.

Comment 57: Line 245: Replace "were most" by "were the most".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 58: Line 247: Replace "to the previous" by "to in previous".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 59: Line 252: Replace "However, the" by "Moreover, the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 60: Line 260: Replace "Europe" by "European".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 61: Line 262: Replace "of CAAQS" by "of the CAAQS".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 62: Line 264: Replace "of original concentrations of" by "of the original concentrations of the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 63: Line 265: Replace "Figure 3 and S2-S3. The original concentrations of all the trace elements exhibited the" by "Figures 3 and S2-S3. The original concentrations of all the trace elements exhibited".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 64: Line 266: Replace "Cu, Co, Zn, Pb, As, and Ga concentrations suffered from" by "The Cu, Co, Zn, Pb, As, and Ga concentrations showed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 65: Line 268: Replace "observed K" by "the K".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 66: Line 273: Replace "of trace" by "of the trace".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 67: Line 274: Replace "on element" by "on the element".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 68: Line 276: Replace "of element concentrations to" by "of the element concentrations to the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 69: Line 277: Replace "by RF" by "by the RF".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 70: Line 281: Replace "on RF" by "on the RF".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 71: Line 286: Replace "has estimated" by "have estimated".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 72: Line 288: Replace "of industrial" by "of the industrial".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 73: Line 291: Replace "However," by "In contrast,".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 74: Line 295: Replace "of deweathered" by "of the deweathered".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 75: Line 297: Replace "future work" by "future".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 76: Line 300: Replace "suffered from" by "showed".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 77: Line 302: Replace "industrial layout" by "the industrial layout"; Line 303: Replace "in high-pollution" by "in the high-pollution".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 78: Line 304: Replace "suffered from" by "exhibited".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 79: Line 307: Replace "in harvest" by "in the harvest".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 80: Line 317: Replace "the higher decreasing ratios at the weekends than those" by "higher decreasing ratios at the weekends than on".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 81: Line 318: Replace "(2020) has" by "(2020) have".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 82: Line 331: Replace "show regular" by "show a regular".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 83: Line 332: Replace "increase from" by "increased from".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 84: Line 334: Replace "Vi and Ni" by "V and Ni".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 85: Line 337: Replace "of original and" by "between the original and the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 86: Line 339: Replace "on trace" by "on the trace".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 87: Line 348: Replace "used RF" by "used the RF"; also, it is unclear what is meant by

"variable importance".

Response: Thank for reviewer's suggestions. The variable importance is a key parameter in the output of the RF model, which reflects the impact of independent variable on dependent variable. The parameter with the highest variable importance could be regarded as the most important factor for the dependent variable.

Comment 88: Line 352: Replace "to the higher" by "to a higher".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 89: Line 356: Replace "displayed slight" by "displayed a slight".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 90: Line 360: Replace "(Figure S6-8). As shown in Figure S8, both of V and Ni showed the" by "(Figures S6-S8). As shown in Figure S8, both V and Ni showed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 91: Line 364: Replace "on source apportionment of" by "on the source apportionment of the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 92: Line 366: Replace "of major" by "of the major".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 93: Line 367: Replace "(PMF 5.0) version" by "(version PMF 5.0)".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 94: Line 368: Replace "elements in PM_{2.5} during 2017-2020 based on" by "the elements in PM_{2.5} during 2017-2020 based on the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 95: Line 371: Replace "of PMF analysis and error diagnostics are" by "of the PMF analysis and error diagnostics is".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 96: Line 372: Replace "Table S4-6" by "Tables S4-S6".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 97: Line 373: Replace "similar cluster" by "similar".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 98: Line 376: Replace "showed the higher" by "showed higher".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 99: Line 378: Replace "Except the domestic heating, we found some episodes during" by "Except for the domestic heating, we found some episodes during the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 100: Lines 379, 435, and 519, and in Table 1: Some numeric data are given with too many significant figures; 2 significant figures suffice and 3 can be used when the first significant figure is "1"; thus, in line 379, replace "2450" by "2500" and replace "2630" by "2600", and in line 435 replace "1458, 479, 636, and 569 ng/m³ to 901, 225, 230, and 345" by "1460, 480, 640, and 570 ng/m³ to 900, 230, 230, and 350".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 101: Line 381: Replace "Figure S6-8" by "Figures S6-S8".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 102: Line 382: Replace "in NCP" by "in the NCP".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 103: Line 386: Replace "such Ag in nonferrous metal ores could be vaporized as the" by "such as Ag in nonferrous metal ores could be vaporized as a"

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 104: Line 387: Replace "Therefore, the" by "Therefore,".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 105: Line 391: Replace "suffered from" by "showed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 106: Line 392: Replace "as the important" by "as important".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 107: Line 393: Replace "of burning" by "of the burning".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 108: Line 397: Replace "in NCP. In our study, As, Co and Pb showed the" by "in the NCP. In our study, As, Co and Pb showed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 109: Line 402: Replace "were mainly sourced from" by "mainly originated from the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 110: Line 403: Replace "occupied more" by "was responsible for more".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 111: Line 404: Replace "world steel production in 2017 (approximate 830 million tons), and 60%" by "the world steel production in 2017 (approximate 830 million tons), and 60% of the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 112: Line 411: Replace "However, Ni" by "Ni".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 113: Line 413: Replace "Figure S6-S8" by "Figures S6-S8".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 114: Line 416: Replace "of V and Ni concentrations displayed the" by "the V and Ni concentrations displayed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 115: Line 422: Replace "Ni the" by "Ni in the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 116: Line 424: Replace "that both of Cu" by "that Cu".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 117: Lines 426-427: Replace "was probably sourced from" by "probably originated from".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 118: Line 428: Replace "continents (Alves et al., 2015; Liu et al., 2018a). Moreover, we have found" by "soil (Alves et al., 2015; Liu et al., 2018a). Moreover, we have found that".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 119: Line 430: Replace "of traffic volume. Thus, the" by "of the traffic volume. Thus,".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 120: Line 433: Replace "Figure 7" by "Figures 7".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 121: Line 437: Replace "displayed slight" by "displayed a slight".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 122: Line 438: Replace "all of the sources to trace elements suffered from" by "all sources to the trace elements showed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 123: Line 440: Replace "to trace" by "to the trace".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 124: Line 441: Replace "of traffic-related" by "of the traffic-related".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 125: Line 442: Replace "However," by "In contrast,".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 126: Line 446: Replace "of clean" by "of the clean".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 127: Line 447: Replace "the cleaner technologies have been upgraded" by "cleaner technologies were implemented".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 128: Line 451: Replace "to trace" by "to the trace".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 129: Line 456: Replace "to trace elements also showed" by "to the trace elements also showed a".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 130: Line 457: Replace "the marked" by "marked".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 131: Line 458: Replace "suffered from" by "displayed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 132: Line 465: Replace "for minor fraction of" by "for a minor fraction of the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 133: Line 468: Replace "the filter sampling" by "filter sampling".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 134: Line 470: Replace "the online" by "online".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 135: Line 473: Replace "Table S7 and Table S8" by "Tables S7 and S8".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 136: Line 474: Replace "of major" by "of the major".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 137: Line 475: Replace "on element concentrations, both of" by "on the element concentrations, both".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 138: Line 476: Replace "original element levels and" by "the original element levels and the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 139: Line 477: Replace "on original" by "on the original".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 140: Line 481: Replace "from slight" by "from a slight".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 141: Line 483: Replace "both of Pb" by "both Pb".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 142: Line 484: Replace "of trace" by "of the trace".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 143: Line 485: Replace "showed the higher" by "showed higher".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 144: Line 486: Replace "all of the elements" by "all elements".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 145: Line 487: Replace "because HQ" by "because the HQ".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 146: Line 488: Replace "were also" by "was also".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 147: Line 489: Replace "show significant" by "show a significant".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 148: Line 490: Replace "of meteorological conditions, we can isolate the impact of clean" by "of the meteorological conditions, we can isolate the impact of the clean".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 149: Lines 491 and 493: Replace "decrease ratios of" by "decreased ratios of the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 150: Line 493: Replace "on original" by "on the original".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 151: Line 495: Replace "decrease ratios of HQ values for" by "decreased ratios of the HQ values for the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 152: Line 496: Replace "much less than those for" by "lower than those for the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 153: Line 497: Replace "show the similar" by "show similar".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 154: Lines 497-498: Replace "show the similar characteristics. For instance, the decrease ratios of HQ values for original Cr (21%) and Fe (27%) were even slightly higher than those for" by "show similar characteristics. For instance, the decreased ratios of the HQ values for the original Cr (21%) and Fe (27%) were even slightly higher than those for the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 155: Line 501: Replace "of elements" by "of the elements".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 156: Line 502: Replace "in the section" by "in section".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 157: Line 516: Replace "air clean policy on" by "the clean air policy on the".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 158: Line 517: Replace "were quantified. The main conclusions were drawn" by "was quantified. The main conclusions were".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 159: Line 518: Replace "showed the rapid" by "showed rapid".
Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 160: Line 520: Replace "Clean air" by "The clean air".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 161: Line 524: Replace "might be not" by "might not be".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 162: Line 528: Replace "offset the" by "offsets the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 163: Line 535: Replace "All of the" by "All".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 164: Line 536: Replace "of As" by "As".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 165: Line 539: Replace "enlightenment for" by "insights for the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 166: Line 543: Replace "these elements" by "the elements" and replace "Sunset" by "a Sunset".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 167: Line 544: Replace "Monitoring" by "a Monitoring".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 168: Line 556: Replace "author has" by "authors have".

Response: Thank for reviewer's suggestions. We have corrected the error.

Pages 21-26, Reference list:

- for authors with more than 1 initial, there should be a space between two subsequent initials;
- there should be a comma instead of a period before the abbreviated journal name;
- abbreviated journal names (and correct abbreviated journal names) should be used; for example, instead of "J. Aero. Sci." it should be "J. Aerosol Sci."

Comment 169: Lines 558-560: This reference should be moved down; it should come before "Dall'Osto et al., 2013".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 170: Line 585: Replace "matter. Atmospheric Environment,89" by "matter, Atmos. Environ., 89".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 171: Line 623: Replace "Greece." by "Greece, ".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 172: Line 643: Replace "metals. J" by "metals, J".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 173: Line 685: Replace " 191" by ", 191".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 174: Lines 714-716: The page numbers are missing.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 175: Line 720: Replace " 5" by ", 5".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 176: Lines 789-790: This reference should be moved up; it should come after "Shi et al., 2015".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 177: Line 792: Replace " 621" by ", 621".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 178: Page 27, caption of Figure 1: Replace "The topographic map of China indicating the location of Tangshan (a), sampling" by "Topographic map of China indicating the location of Tangshan (a), the sampling".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 179: Page 28, caption of Figure 2: Replace "The bar" by "Bar"; furthermore, it should be indicated what the data in the figure represent; are they mean values and associated standard deviations?

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 180: Page 29, caption of Figure 3: Replace "of original" by "of the original"; furthermore, it should be indicated what the data in the figure represent; are they mean values and associated standard deviations?

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 181: Page 30, caption of Figure 4: Replace "The original" by "Original"; furthermore, it should be indicated what the data points and shaded areas in the figure represent.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 182: Page 31, caption of Figure 5: Replace "of original" by "of the original" in lines 1 and 2; furthermore, it should be indicated what the data in the figure represent; are they mean values and are the error bars associated standard deviations?

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 183: Page 32, caption of Figure 6, line 2: Replace "in RF models for" by "in the RF models for the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 184: Page 33, caption of Figure 7: Replace "The deweathered concentrations of" by "Deweathered concentrations of the"; furthermore, it should be indicated what the data in the figure represent; are they mean values?

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 185: Page 34, caption of Figure 8: Replace "of six sources to the deweathered concentrations of elements in PM2.5 based on PMF" by "of the six sources to the deweathered concentrations of the elements in PM2.5 based on the PMF",

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 186: Page 35, heading of Table 1: Replace "The comparison of" by "Comparison of the"; also it should be indicated what the unit is for the numeric data.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 187: Page 36, heading of Table 2: Replace "The non-carcinogenic" by "Non-carcinogenic"; also it should be indicated what the unit is for the numeric data.

Response: Thank for reviewer's suggestions. The unit for the numeric data is 1.

Comment 188: Page 38, heading of Table 3: Replace "The non-carcinogenic" by "Non-carcinogenic"; also it should be indicated what the unit is for the numeric data.

Response: Thank for reviewer's suggestions. The unit for the numeric data is 1.

Alterations, Corrections and Comments for the Supplement:

Comment 189: Page 1, for affiliation "c": Replace "energy conservation and environmental protection" by "Energy Conservation and Environmental Protection".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 190: Page 2: I found no reference to this section in the Main text, whereas such reference is needed.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 191: Page 2, line 1: Replace "the detailed" by "Detailed".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 192: Page 2, line 2: Replace "Chinese government imposed many emission controls to alleviate" by "the Chinese government imposed many emission controls to alleviate the".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 193: Page 2, line 3: Replace "enhanced comprehensive" by "enhanced a comprehensive".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 194: Page 2, line 4: Replace "Second" by "Secondly".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 195: Page 2, line 5: Replace "upgrade industrial" by "upgrade their industrial".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 196: Page 2, line 6: Replace "Third" by "Thirdly".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 197: Page 2, line 8: Replace "the energy efficiency were tried to improve" by "it was tried to improve the energy efficiency".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 198: Page 2, line 9: Replace "Chinese governments tried to optimize industrial layout. Chinese" by "The Chinese governments tried to optimize the industrial layout. The Chinese".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 199: Page 4, caption of Figure S2: Replace "The time-series varies variations of" by "Time series for"; also it should be indicated what the unit is for the data in the figure.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 200: Page 5, caption of Figure S3: Replace "The time-series varies variations of" by "Time series for"; also it should be indicated what the unit is for the data in the figure.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 201: Page 6, caption of Figure S4: line 1, replace "The performance" by "Performance"; line 2, replace "original" by "of the original"; line 3, replace "applied to" by "used to"; also it should be indicated what the unit is for the data in the figure.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 202: Page 7, caption of Figure S5: Replace "The changes" by "Changes".

Page 8, caption of Figure S6: Replace "The 72-h" by "72-h"; also it should be indicated what the unit is for the K data in figure (b).

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 203: Page 9, caption of Figure S7, line 1: Replace "The 72-h air masses" by "72-h air mass".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 204: Page 9, caption of Figure S7, line 2: Replace "of total air masses" by "of the total air mass trajectories".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 205: Page 10, caption of Figure S8: Replace "The polar" by "Polar"; also it should be

indicated what the unit is for the V and Ni data in figures (a) and (b).

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 206: Page 11, caption of Figure S9: Replace "The source" by "Source".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 207: Page 12, caption of Figure S10: Replace "The diurnal" by "Diurnal".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 208: Page 13, heading of Table S1: Replace "The basic" by "Basic".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 209: Page 14, heading of Table S2: Replace "by Model" by "by the Model".

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 210: Page 15, heading of Table S3: Replace "The sampling duration, analytic method, and average element" by "Sampling duration, analytical method, and average"; also the unit for the numeric data in the table should be given.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 211: Page 15, Table S3: Replace "Visser et al. (2015)" by "(Visser et al., 2015)"; also, this reference is missing in the Reference list.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 212: Page 15, Table S3, column 1: Replace "Analytic method" by "Analytical technique"; also the abbreviated analytical techniques should be explained (written full-out) in a footnote.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 213: Page 20, Table S8: The units for the numeric data in the table should be indicated.

Response: Thank for reviewer's suggestions. The data did not have units or the units could be considered as 1. These data are health risk values.

Response: Thank for reviewer's suggestions. We have corrected the error.

Comment 214: Page 21, Reference list: the references are not in the proper format:

- the publication year should come at the end of the reference;
- for authors with more than 1 initial, there should be a space between two subsequent initials;
- there should be "and" before the last name of the last author;
- titles of journal articles should be in lower case instead of in Title Case;
- there should be a comma instead of a period before the abbreviated journal name;
- abbreviated journal names (and correct abbreviated journal names) should be used.

Response: Thank for reviewer's suggestions. We have corrected the error.