

## ***Interactive comment on “Measurement report: Dual-carbon isotopic characterization of carbonaceous aerosol in Beijing and Xi’an: distinctions in primary versus secondary sources” by Haiyan Ni et al.***

**Anonymous Referee #1**

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The measurement report by Ni et al. is an excellent manifestation of the measurement report paper. Despite not presenting strikingly new results, comparative studies involving lesser studied cities or regions are encouraged as long as the data analysis is done robustly and extensively. I particularly commend Bayesian MCMC simulation in addition to  $^{14}\text{C}$  analysis which enhances the results as well as excellent and informative Figures. The paper is very well written and can be published after addressing few minor comments.

Comments

C1

Line 22. The term "clean" can hardly be attributed to mega-city environment. Perhaps "moderately polluted" or at least "relatively clean". Haze is typically related to poor visibility, so perhaps the use of "clear weather", which can be quite polluted too, can be more informative. The term "clean" is used throughout the text and I encourage finding a proper substitute.

Line 33. Field measurements.

Line 35. I think it should be stressed that better understanding of sources outside capital Beijing is needed for comparison as well as for more comprehensive understanding. Beijing was fairly well studied already.

Line 85. Please indicate similarity quantitatively as there is a proportionality issue commented later.

Line 149. Concentrations neither  $<100$  nor  $<20$  can be considered clean, especially that the two numbers differ by five times. If haze concentrations in Xian were defined  $>250$ , that is only 2-3 times different to clean, so certainly qualifies for moderate pollution. Furthermore, if Chinese national pollution standard is at  $75\mu\text{g}/\text{m}^3$ , concentration  $<100$  can in no way qualify for clean.

Line 177. will be much higher.

Line 250. ...emissions are very low in winter.

Line 277. Why would large secondary formation from fossil sources be particularly favoured in Beijing only? With no plausible explanation it should be dismissed. Stronger contribution from coal combustion (both primary and secondary) sounds convincing given Beijing geographical location.

Line 287. ...by significantly larger...

Line 294. ...wide range of EC concentrations.

Line 301. same as above comment

C2

