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Interactive comment on “Carbonaceous species in PM_{2.5} at a pair of rural-urban sites in Beijing, 2005–2008” by F. Yang et al.

Anonymous Referee #1

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General comments: The authors analyzed OC, EC concentrations in weekly integrated PM_{2.5} samples collected at one rural and one urban site in Beijing over four years between 2005 and 2008. They found that a systematic decrease of annual mean concentration of OC and an opposite trend for EC at both sites, and the significantly lower fractions of TCM (total carbonaceous mass) in PM_{2.5} mass than those measured at TH in 1999, indicate that the relative importance of carbonaceous species in PM_{2.5} was probably weakened whereas that of EC in TC 10 was steadily enhanced. The authors also described the effects of emission control during the Beijing Summer Olympics in 2008 on the PM_{2.5} loading and OC, EC concentrations in Beijing. Carbonaceous aerosols in megacities of China are of great interest nowadays as China is regarded as one of the most important contributor to airborne particles in the troposphere. The conclusion of the manuscript that the importance of carbonaceous species in PM_{2.5}

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was weakening is quite interesting. Unfortunately, I should say that the manuscript is not well organized to support their findings. The language usage should be greatly improved before publication.

Specific comments: 1 page 8724, line 23-29, the method used to analyze OC, EC concentration is different to the normal TOT or TOR protocol, could the authors give more information on the comparability of this method to the normal ones? It's of concern because comparison was made in the manuscript between the data of this study and the data published earlier or data from other groups. 2 page 8727, line 7-11, the authors used the more positive stable carbon isotope value of EC in winter as a indicator of the enhanced contribution from coal combustion. And in page 8728, the authors also used stable carbon isotope value as evidence to show the decrease in gasoline and diesel consumption during the 2008 Olympic Games. It seems that the carbon isotope value of EC is quite important for the explanation of the author's findings and I think the authors have had the data in hand. I think it would be very helpful to improve the manuscript if the dataset of carbon isotope be included. 3 page 8728, line 24-29, the authors said "these indicate that local emissions play a more important role than regional transport for contribution to fine carbonaceous particles in Beijing". I don't understand why? When the urban site had similar concentration with the suburban site, one could not conclude that the local contribution was more important, maybe the opposite was also reasonable. 4 page 8732, line 14-16, the authors stated that "the fractions of TCM in PM_{2.5} mass at TH and MY in 2008 were significantly less than those measured in Beijing before". In my opinion, this is the most important conclusion of the manuscript. I think the authors should make more explanations on that. Firstly, the authors should make sure the analyzing method is not the cause of the mentioned difference. Secondly, the authors should discuss if such a trend exist in the year of 2005-2008 using their own data set.

Comments on language usage: The English writing should be greatly improved. Many of the sentences are very difficult to follow in the current state. Below are some ex-

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amples: 1 page 8725, line 26-27, what's the meaning of "Each season presented both high and low OC levels at the rural site over the four study years"? 2 page 8729 line 26 to page 8730 line 2, "Not surprisingly given the large differences regarding to carbonaceous particles emissions related anthropogenic and natural activities between the paired urban and rural sites, there are striking difference in their OC and EC levels and variation patterns. In the urban area, about 80% of the energy consumption is concentrated, and the overwhelming majority of soaring population of motor vehicles in recent years (3.50 million in 2008 compared to 2.58 million in 2005) is used". It is really a headache to read so "complicated" sentences.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 8719, 2011.

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