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Comment

## ***Interactive comment on “Study of the regional CO<sub>2</sub> mole fractions filtering approach at a WMO/GAW regional station in China” by S. X. Fang et al.***

### **Anonymous Referee #1**

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This paper evaluated filtering methods to obtain regional representative CO<sub>2</sub> concentration at one station located in southern China. This location must be affected by local CO<sub>2</sub> emission such as industries, wild fire, and car exhaust as well as biological activities. Authors tried to use four methods and evaluated each characteristics in terms of CO<sub>2</sub> level, seasonal variation and annual increase rate. Meteorological filtering seems better to get regional average concentration. From the viewpoints of meteorology, it is rather important to get representative CO<sub>2</sub> value. On the other hand, if we use data for model simulation, it may be OK even if it includes the data which is influenced by various sources and sinks.

C2745

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1) P.7061. Authors stated that CO<sub>2</sub> mole fraction was previously estimated to be 404.2ppm and also Pu et al. gave another value (407ppm). This time even though they applied four kinds of filter, they did not give us the explanation about the relation or evaluation to such previous values. They should try some.

2) P7061. Recent inverse modeling use much more fine data (e.g. 1hr average), not regional average for a certain time period. So, 3 ppm difference between the average methods may not always bias the model simulation.

3) P7067 and P7070. Annual increase rate should be rather consistent with global or regional background. For example, you can compare with Yonaguni as a nearest WMO site. Even globally, we observed over 3ppm/y in 2010. If you compare the increase rate from 2009 to 2010 using Table 1, growth rate for REBS and AUX are too small (i.e. 2ppm/y), showing existing of some bias. On the other hand, increase rate from 2010 to 2011 for three methods except BC, showed too large values. Globally increase rate decreased to below 2ppm/y. Could you explain any reasons for that?

4) P7071. Local signal showed both higher bias and lower bias than regional signal. If you average these values as local CO<sub>2</sub> events, it is hard to explain their characteristics. Could you evaluate these bias separately?

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