

## ***Interactive comment on “Refined estimate of China’s CO<sub>2</sub> emissions in spatiotemporal distributions” by M.-M. Liu et al.***

**Anonymous Referee #2**

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The paper investigates an important issue about China's emission uncertainties by adding new contributions about emission sources and trends from spatial and temporal dimensions. The paper is well structured and well written. The results are clearly presented and I would recommend a publication as soon as possible. There are a few minor issues I would like to draw attentions from the authors. 1. The Fig 3 is very messy. I understand the authors are trying to show the trends for 31 provinces in China, but the presentation can be better improved by selecting a few important provinces for illustration. Alternatively, the authors may like to use 'shade' to group the provinces in terms of geo-economic conditions (e.g. South West, East Coast etc). 2. In many other researches, Tibet (XZ) is excluded from the study due to the data limitation. In this paper, Tibet is analysed but without much discussion. Explanations about the data

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sources for the unusual regions can be useful. 3. Section 2.3, line 15-25, there are discussions about power plants emissions as LPS, how many plants did you included here, and equal to x% of total production capacity? 4. Under section 3.3 (Temporal distribution), the discussion for the December as the most energy consumption intensive month is a bit rough. I am not convinced about the reasons listed in the texts. Perhaps, it will be good to back up the argument by using the physical production outputs (e.g. steel, electricity production etc)? The argument about annual quotas at end of the year is casual. I would not use that as an explanation. 5. A couple of place talking about the importance of CDIAC as a data source, you may need emphasize once only. For example, page 17460, line 5, you can delete the content in the brackets. 6. Figure 8a, more explanation about why your data and CDIAC can match very well from 2001 – 2008 April, but strong variation in later half of 2008? 7. There are several paragraphs about the implication of data variation to climate models / air pollution models. For example, in page 17459 lines 10-15; and section 3.4. I very much appreciate the discussion, but it may need another paper to tackle this issue in full. I would suggest the authors reconsider whether you would like to include the info into this manuscript.

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