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Comment

# ***Interactive comment on “Interannual variability of the atmospheric CO<sub>2</sub> growth rate: relative contribution from precipitation and temperature” by J. Wang et al.***

**Anonymous Referee #1**

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This paper analyzed causes of interannual variability in atmospheric CO<sub>2</sub> growth rate, and discussed the importance of tropical temperature and precipitation based on the analysis of Mauna Loa CO<sub>2</sub> growth rate, TRENDY terrestrial carbon cycle model outputs, and climatic parameters. The topic of the manuscript is important to give an insight to global terrestrial carbon cycles, especially in tropics. Therefore, topic of this paper is relevant to Biogeosciences.

I felt that the conclusion of the manuscript, ‘Because NPP is largely driven by precipitation, this suggests a key role of precipitation in CGR IAV despite the higher CGR correlation with temperature (P19074, L19–21 in abstract)’ is not sufficiently supported

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by the results. Therefore, this statement should be toned down (or add some more clear analysis). The authors claimed that 'NPP is largely driven by precipitation (e.g. P19074L19, P19085L12-13)', however, the statement is not based on this analysis, but based on existing literature. Important factors of tropical NPP are, I believe, still debatable and depending on the study (e.g. Clark et al. 2003 (cited in this study) suggests importance of temperature, plus many literature are listed in the introduction section). If the authors would like to clarify the importance of temperature/precipitation on NPP, further model sensitivity test is required.

Furthermore, it might be helpful to add why this study made a different conclusion compared with Wang et al. (2013) PNAS paper (cited in the manuscript) in discussion section. Wang et al. (2013) claimed importance of temperature in tropics on Mauna Loa CO<sub>2</sub> growth rate based on the datasets similar to this study. Therefore, adding some statement is helpful to understand the differences between this study and Wang et al. (2013).

I am sure that adding these descriptions significantly improve the manuscript. Therefore, my suggestion is major revision before acceptance.

Specific comments

P19074 L19: soil respiration -> heterotrophic respiration P19080 L23: (5) missing model name.

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Interactive comment on Biogeosciences Discuss., 12, 19073, 2015.

**BGD**

12, C8947–C8948, 2016

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