

## ***Interactive comment on “Clumped isotopes in near surface atmospheric CO<sub>2</sub> over land, coast and ocean in Taiwan and its vicinity” by Amzad H. Laskar and Mao-Chang Liang***

### **Anonymous Referee #1**

Received and published: 13 May 2016

This study provides excellent dataset for almost all of CO<sub>2</sub> isotopologues in the atmosphere. Air samples were collected quite extensively, from open ocean, coasts, mountain, forest, grassland, sub-urban and urban traffic. Moreover, closed terrarium experiment and collecting exhaust from cars were conducted as well. Research plan and obtained results are very nice.

While authors provides very valuable dataset, the individual discussion seems not always nice. My major comments on their discussion are; 1) They apply Keeling plot to most cases for source identification. If the case is simple two-source mixing, Keeling plot must be effective. However, this is generally not applicable for the case that source and sink coexist, except that both are the same isotopic composition (fractionation) and

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fluxes. I guess greenhouse experiment and grassland observation may be the cases. When Keeling analysis does work well, then authors seek the reason of inconsistency and develop some discussion. Some of these discussions are not so effective. Authors should pay attention that Keeling plot is not a universal tool. 2) On a related matter of 1), developed discussions about D47 results are mostly concluded to "unknown" enzymatic reaction during photosynthesis. Therefore, any quantitative discussion, such as estimating individual fluxes from/to the urban CO<sub>2</sub>, is not offered. Another approaches may be possible, I guess.

I think this manuscript is worth-publishing to the journal Biogeosciences after addressing specific comments supplied as a separate file. Specific comments involve these issues, too.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2016-106/bg-2016-106-RC3-supplement.pdf>

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Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-106, 2016.

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