

## ***Interactive comment on “Impact of different fertilizers on the carbonate weathering in a typical karst area, Southwest China: a field column experiment” by Chao Song et al.***

### **Anonymous Referee #1**

Received and published: 2 November 2016

This study presents the responses of carbonate weathering to different fertilizer addition using the field column experiment. In this study, the authors analyzed weathering amount and ratio of carbonate rock tablets after one year field experiment. Especially, it is interesting that authors identified the variability of carbonate weathering rate under various treatment. The data interpretation and organization in this manuscript is clear. This study provides valuable data and good measurement of carbonate weathering. However, the manuscript still has some points need to be further clarified. 1. Could authors provide the ratio of the nitrate fertilizer vs. total nitrogen fertilizers in studied area, or China, or whole world? It is important for the significance of the manuscript and the experiment. 2. Could authors compare results with data by Prof. Yuan DX's group

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? 3. The manuscript need more detail for the experiment. L134-L139: Please give a detail introduction for the added amount of fertilizers in these treatments. It seems that the added amount of nitrogen is slight difference. What's the proportion of these eleven fertilization treatments in local practical use? Why choose the added amount of fertilizers are 30 times than its local practical amount? The application fertilizers in local practical may change two or three times to use. Do you think the added fertilizers by one time may affect the result? Why don't authors set different height for this experiment, which might be more interesting? Does author consider that the land use influences the carbonate weathering in the experiment? 4. The authors made three replications. So please show the data errors for each average value. 5. Could you assess the variation of nitrate fertilizer change in the column. Then understand the balance between acid producing and carbonate weathering together. 6. Line 15-17, the sentence has too many "different"s. Please revise it. 7. In section 2.2, could authors provide details about abbreviation of OM, ASI method and others when you write that at the first time. Please check that in whole manuscript. 8. L162-166 It seems Table 2 and Fig3 are repeated. 9. L182-L197 This paragraph can be removed to the introduction. 10. L213-L219 It is repeated the introduction (L49-L54). 11. Major conclusion might be revised. Ammonium fertilizer mainly includes  $\text{NH}_4\text{NO}_3$ ,  $\text{NH}_4\text{Cl}$ ,  $(\text{NH}_4)_2\text{CO}_3$  fertilizers, not includes urea fertilizer. I suggest reductive nitrogenous fertilizer could enhance carbonate weathering via nitrification.

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Interactive comment on Earth Surf. Dynam. Discuss., doi:10.5194/esurf-2016-50, 2016.

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