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Comment

## ***Interactive comment on “The magnesium isotope record of cave carbonate archives” by S. Riechelmann et al.***

**S. Riechelmann et al.**

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Dear Editor, dear reviewers,

We greatly appreciate the overall very positive and encouraging reviews that will doubtlessly lead to a much improved version of this paper. Below we comment on the short list of points of criticism brought forward by the two reviewers:

Reviewer 1 (Baldini)

Reviewer 1 considers the paper well-written and comprehensive. We appreciate this statement. We agree with reviewer 1, that moving text from section 5.1. to the first pages of the paper will make the text more reader friendly. We will incorporate references regarding detrital content and make an attempt to plot  $^{232}\text{Th}$  against Mg. We

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see problems in directly comparing  $^{232}\text{Th}$  to Mg inasmuch as we rarely have Th and Mg data from the same stratigraphic interval of the speleothem. We will incorporate all technical comments as requested. Thank you for your constructive feedback.

Reviewer 2 (Tipper)

Thank you for your very positive statements. We agree that moving the fluid inclusion text and the detrius text to the methods chapter is a good suggestion and we will do so. We are aware of the recent work of the reviewer and fully appreciate the complexity of weathering rates and other processes in the soil and aquifer zone. We agree that there is no easy and direct relation between Mg and weathering and we say so in the paper. We politely disagree with the reviewer's statement regarding the lack of Sr and its bearing on weathering and source material. Buhl et al. (2007) show a combined Sr and Mg data set from Morocco (shown here) and document a very clear relation between changes in  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $^{26}\text{Mg}$ . Hence, we do show data albeit not from all case settings. Second, the probably best studied case example is Bunker Cave (Riechelmann et al., 2012) and there we do show a very detailed data set including rain water, soil water, karst water, drip water and speleothem calcite. In essence, we do NOT ignore isotopic fractionation and these data are published. At present we undertake leaching experiments using different carbonate and soil materials. In this sense, the present paper is a status report that requires updating with new data will become available. We will make sure this is absolutely clear in the revised version of the paper. We will try to clarify text in chapters 5.4 and 5.5. Thank you for this comment. We will incorporate the technical comments as far as possible.

In summary, we consider the reviewers comments both useful and feasible. Thank you!

The authors

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Interactive comment on Clim. Past Discuss., 8, 1835, 2012.

CPD

8, C868–C869, 2012

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