

## ***Interactive comment on “Novel method for determining $^{234}\text{U}$ - $^{238}\text{U}$ ages of Devils Hole 2 cave calcite” by Xianglei Li et al.***

### **Anonymous Referee #1**

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General Comments: This is an interesting and excellent study that uses the correlation observed between the cave calcite  $\delta^{234}\text{U}_i$  and stable isotopes in the core from Devils Hole 2 to establish a multilinear model for prediction of the  $\delta^{234}\text{U}_i$ . This model allows the authors to predict much precisely a value of  $\delta^{234}\text{U}_i$  and thus to improve the precision of  $^{234}\text{U}$ - $^{238}\text{U}$  dating method. Major Comments: 1) It lacks a figure in the MS to show the  $\delta^{234}\text{U}_i$ ,  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  time-series. 2) For the regression analysis, the authors split the observed  $\delta^{234}\text{U}_i$  into three groups according to the age range and the precision. However, it will be better to find a weighting method, which can help to take into account all of the observed values of  $\delta^{234}\text{U}_i$  over the past 590 ka. 3) The figure 3 shows the variability of the residual and  $\delta^{18}\text{O}$  versus  $^{230}\text{Th}$  age, but its significance was poorly explained. Minor Comments: 1) It will be better to add some

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information about the relationship between U-concentration and  $\delta^{234}\text{U}_i$  in the results. 2) It is difficult to identify the difference in precision between the  $^{234}\text{U}$  ages and the  $^{230}\text{Th}$  ages from the figure 4. It will be better to provide some detailed comparisons of the two dating ages in terms of precision. 3) In the conclusions, the authors should acknowledge that the conclusions are based on the regression analysis of the  $\delta^{234}\text{U}_i$ ,  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  datasets over the past 309 ka, but not over the past 590 ka.

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