

## ***Interactive comment on “The first luminescence dating of Tibetan glacier basal sediment” by Zhu Zhang et al.***

### **Anonymous Referee #2**

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#### General comments:

The Manuscript by Zhang et al. is interesting, original and well written and suitable for publishing in the cryosphere after a few minor adjustments.

#### Specific comments:

- 1)The inconsistency in chronology between the Guliya ice core record and the Kesang stalagmite mentioned in the introduction, should be described.
- 2)It seems that the dating has been performed on basal ice, however it is a little unclear and should be more clear!
- 3)"Ice content" and "water content" seem to be used randomly. This should be more

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clear.

4)The influence of the ice matrix on the dose-rate should be accounted for in detail and explained and an evaluation of dose-rate for each scenario should be performed.

5)The photograph of the Core 2 show a very clear transition to basal ice in the core, however Core 4+5 are retrieved at a different place at the ice-cap where the contour-lines in the map of Figure S1 suggest more ice dynamics, and the bottom part of the cores can be much more mixed. The 4-11 micro-metres fin-grained quartz used for the dating could be eolean material deposited onto the ice and therefore younger than the ice-cap. If this is the case, the grains would recieve most of their dose after mixing with the basal ice. The authors should discuss this possibillity.

6)In the conclusion the authors suggest collecting more suitable glacier basal sediment. It should be explained what "suitable" means.

Technical corrections:

page 1, line 9: more than one order of magnitude younger page 1, line 15: interpretation of this information. page 5, line 5-6: The sentence "We have no information about the behavior of ice in the sediment" should be refrased.

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