

## ***Interactive comment on “Internal structure of event layers preserved on the Andaman Sea continental shelf, Thailand: tsunami vs. storm and flash flood deposits” by D. Sakuna-Schwartz et al.***

**Anonymous Referee #1**

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This paper reports an ambitious work for distinguishing shallow-marine tsunami deposits from other possible event deposits in sediment cores taken after the 2004 Indian Ocean tsunami from the Andaman Sea shelf. Its output would help integrated assessment of geological evidences for past coastal disasters caused by tsunamis. I thus believe that this paper should be eventually accepted for publication in NHESS, but a number of points should be addressed before that. These points are listed below, and most critical is the reliability of Pb-210 dating. Generally, it is not easy to use this technique in such a heterogeneous succession as the Pb-210 density is also related to grain size. Although you only mention the average sedimentation rate throughout the

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core, the sedimentation can be intermittent, and thus would be much faster or slower in places. You do not validate your correlation of facies A&C and C in cores 030310-C3 and 050310-C2, respectively, which occur deeper than tsunami deposit in other cores. If these facies are not 2004 Indian Ocean tsunami deposit, the conclusions might be revised. This validation could be a bit tricky but at least you have to mention it. The manuscript is generally not written clearly and in many places confusing although it appears not to contain serious failures.

L26-27, P7228: The Ayeyarwady-Salween river, not possible to show in Fig. 1?

L26-27, P7229: Where are flash flood from?

L19, P7231: insert “(SAR)” after “accumulation rates”

L1, P7238: As the input of terrigenous material is supposed to be important for distinguishing tsunami from storm deposits, the Ti/Ca profile should more clearly described and examined in detail.

L15, P7238: Following the initial description of sediment facies observed in cores, you need to add a section that summarizes the classification of facies, especially A-C.

L21, P7238: Given that some fine-grained layers are from flash floods, how do you exclude the possibility that the rest of them were formed by tropical storms.

L5, P7239: You have to clarify which particular river mouth (or even estuary mouth) is responsible for generating the flash flood in study area.

L20-21, P7239: This depends on the depth of bioturbation and thickness of the layer deposited.

L1, P7240-L6, P7241: Not clear how many layers were formed and preserved after these historical storms. It seems more storms occurred than the number of preserved layers. You also assume the measured sedimentation rate at other core sites. This is likely misleading, as the rate is highly variable in inner-shelf environment. Although I

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do not request you to add more dataset, this assumption should be presented clearly not to mislead readers.

L17, P7240: the age could be older than 50 yrs if you adapt the rate 0.54 cm/y.

L7, P7241: While the depth of the tsunami deposit appears consistent in cores 030310-C2, 050310-C4, and 030310-C7, it is variable in other three cores. How do you exclude the possibility of storms for forming facies A and C in cores 030310-C3 and 050310-C2? How old are these tsunami layers estimated according to Pb-210?

L16-17, P7241: You have not mentioned that Ti/Ca ratio is lower in the tsunami deposit.

L27, P7241: These data show, if I understand correctly, the limited extent of sediment transport, and do not exclude the possibility that tsunami deposit occur in deeper water.

L3-18, P7242: This paragraph is largely unclear. It is even not easy to understand what is inversed and what is normal. Should be restructured.

L4-5, P7242: an inverted sequence is found in core 030310-C3: The inferred tsunami deposit in 030310-C3 seems too deep relative to other cores. You do not mention the rationale of validity of Pb-210 for this core.

L10-11, P7242: Please make sure if this is concordant with L27, P7242.

L16-18, P7242: Just two waves may be enough to account for the inversion.

L22, P7242: You said "several" in L17 and here specified three?

L23-25, P7242: Cross lamination is very common even other types of sandy deposits. This argument is not meaningful as the cross lamination observed here is not bi-directional and has not information useful for the interpretation.

L15, P7244: Again, check L16-17, P7241.

L23, P7244: I cannot imagine how "ephemeral channels" look like. This seems not be a common terminology of coastal terminology. Is there any satellite image showing the

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development of this type of channel in study area?

Figure 3: Not clear to find where these images were taken in Fig. 1.

Table 5: Occurrence (max water depth): How can you constrain the maximum water depth of these facies occurrence just based on the six cores. Especially, flash flood has never been studied in this region as you mentioned in L27, P7229.

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