

Clim. Past Discuss., author comment AC2  
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## Reply on RC1

Yoav Ben Dor et al.

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Author comment on "Hydroclimatic variability of opposing Late Pleistocene climates in the Levant revealed by deep Dead Sea sediments" by Yoav Ben Dor et al., Clim. Past Discuss.,  
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### Response to Report #1

By Anonymous Referee #1

#### Response to general comments:

We appreciate the reviewer's comments and overall positive attitude towards the manuscript. We will adjust the discussion to address the comments made by the reviewer, such as the possible role of different precipitation sources on the hydrologic and the isotopic signal of the studied sediments. We will also improve the introduction and discussion sections addressing laminae formation, and make sure that our conclusions are distinct from any conjectures, and that they are directly supported by the data and its analyses. Considering the other reviews, we acknowledge the notion that no distinct periodical component is clearly identified in our records, and we will adjust the discussion and conclusions accordingly.

#### Response to specific comments:

**Comment:** This maybe in the other papers by the author team, but can you distinguish between a detrital laminae with sub-layers and a period with no aragonite laminae deposition? From this paper it appears the assumption is that you will always have an aragonite sub-layer?

**Response:** The nature of the sediments and the way that we understand their formation, according to modern analogues and previous detailed investigations of available exposures, suggest that detritus-aragonite couplets are deposited annually, thus forming varves. This is further supported by our microfacies analyses based on continuously sampled thin sections, in which we observe even slight changes in the sediments in details. This is further supported by previous studies of the Dead Sea sedimentary record (e.g., Stein et al., 1997; Marco et al., 1996), the study of modern lakes by monitoring and recent cores, and the agreement between laminae counting and independent radiometric dating such as  $^{14}\text{C}$  and U-Th (Prasad et al., 2009; Haase-Schramm et al., 2004). Thus,

because no deposition of alternating aragonite and detritus takes place under modern conditions in the Dead Sea (e.g., Ben Dor et al., 2021), the interpretation of alternating aragonite and detritus facies as annual deposits is, to some extent, a (pretty solid) assumption, as it cannot be directly determined for the studied interval Lake Lisan (e.g., Prasad et al., 2004; Ben Dor et al., 2019). We will make sure this is clear in the introduction of the revised version.

**Comment:** Please make it clear throughout which data are new here and which are from Ben Dor et al., 2018 e.g. Figure 1 looks very similar to figure panels from that paper.

**Response:** We will clarify which parts of the data are new. The only previously published data is the annual flood frequency, which was published in Ben Dor et al., 2018. We will readjust the figures and their captions accordingly.

**Comment:** Is it possible to be more precise with the ages? This may be discussed in the other paper in more detail, but a bit more detail of the chronology would be useful for readers who approach your work through this paper.

**Response:** We will elaborate on the age-depth model in the introduction of the core and its determination.

**Comment:** As I suggest above, I'm not convinced by the wavelet analysis presented in Figure 7 as a strong support for your hypotheses of persistent cycles, even in wetter periods.

**Response:** Thank you for pointing this out. We will revise the manuscript according to this comment and also in light of the comments made by the other reviewers. As suggested by the other reviewer, we will calculate the area-wise false positive detection estimation and the wavelet coherence to examine the reliability of the wavelet analyses. We will further adjust the emphasis made in the text on these analyses in accordance with the results of the revised calculations.

#### **Response to technical corrections:**

All technical corrections will be corrected accordingly.

#### **Cited references:**

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