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Interactive comment on "Extreme marine events revealed by lagoonal sedimentary records in Ghar el Melh during the last 2500 years in the northeast of Tunisia" *by* Balkis Samah Kohila et al.

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The authors would like to thank the Anonymous Referee #2 for his valuable comments and suggestions, they will be seriously taking into consideration and corresponding corrections will be made in the next version of the manuscript. However, we present some clarification and answers (R) to his questions (Q) in the following text :

Q1 : The first issue is the chronology. Figure 7 clearly illustrates the uncertainty linked with the age model. The core GEM 4 is badly dated (where is the table with the details of the radiocarbon dates?). A chronological gap of ìť 1400 years in the middle of the core hinders any calculation of a secure age-depth model, and may suggest an

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important chronological issue. The authors must correct this point (more radiocarbon dates in the middle part of the core), otherwise, they must discuss this chronological uncertainty in the manuscript. As it stands, the core GEM 4 is too “subject to caution” to be really used here as evidence. The part “4.2.1. Age model” is clearly insufficient to answer to this issue. R1: Figure 7B determines a period of inactive deposition process or erosion so-called “a Condensed area” and not a chronological gap in the age model. Supplementary radiocarbon dates between 55 cm and 72 cm (an interval of 17 cm only) will not give more information because we have a condensed area. The GEM4 is well dated with seven radiocarbon dates. We have a 14C date every 10 cm approximatively. It is very rare to observe in the literature sedimentary archives dated every 10 cm.. Thus„ we will not realize more radiocarbon dates on this core in order to have a better chronological framework. This has never been done in coastal environments.

Q2 : The second problem is the lack of objective analyses to probe what the authors claim. Statistical analyses must be considered here. The PCA (Fig. 2) is a good start but other tests must be used. What is the software used for the PCA? With which parameters? Why the authors did not apply the same PCA on all the data from the cores? Why were only the “surface sediment sources” included in the matrix? The authors must develop this analytical part to probe their conclusions and, mostly, they must use all the data from their cores, not only the surface deposits.

R2 : In coastal environments, the principal component analysis (PCA) was usually performed on the sediment sampled around lagoons in order to characterize the different sources of sediments deposited in the lagoon and to determine the several poles related to potential sediment sources supplies. We choose the Mn, Ti, Zn, Ba, Rb, Fe, Sr, Ca, and Si elements due to their good detection by the mobile XRF. We established the calculation factors F1 61.12% and F2 11.13% of the geochemical dataset using the XLSTAT-2016 statistical software. The apply of the same PCA on al the data from the two cores is a good idea, but in our study, the tracing of sources should be done on

recent surface sediments and not on cores deposits (Degeai et al., 2015, Gaceur et., al 2017, Affouri et al.,2017, Khalfaoui et al,. 2019 ;2020). Q3 : The discussion is too weak to really be “a discussion”. This part only summarizes the results, with auto-citations, and does not compare or integrate the data in a wider perspective (climate shifts, human impacts, etc: : :). This part must be rewritten and must integrate more references, more comparisons, more “other hypotheses”. As it stands, we have the bad impression that the authors take their results as evidences and do not feel the need to compare or integrate their findings with what has been previously published on this subject. More caution is needed here.

R3 : Your recommendation will be taken into account. In the new version, we will try to reformulate this part and append a paragraph Âń 5.1. Site sensitivity to overwash deposits Âż to enrich the discussion. We will try also to integrate more references and hypotheses.

Q4 : The paper presents interesting data. Nonetheless, there are a number of problems that must be addressed before publication. R4 : Thank you very much, and we will take into account every recommendation in the next version.

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