

## ***Interactive comment on “Paleodepth variations on the Eratosthenes Seamount (EasternMediterranean): sea-level changes or subsidence?” by S. Spezzaferri and F. Tamburini***

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I am sorry but can not see the significance of this manuscript. The authors argue for influence of GLOBAL sea level changes on the paleodepth of tectonically active Eratosthenes Seamount (Mediterranean Basin), comparing a paleodepth curve for that location with an oxygen isotope stack (i.e., a proxy estimate of sea level change as a result of changing polar global volume assuming no change in deep-sea temperature). There is no attempt to establish the statistical significance postulated correlations between the two. Of course, global changes in sea level must affect sea level everywhere in the world, by definition, but the authors do not present evidence that this effect has

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been of any significance at Eratosthenes Seamount.

There is a glaring problem: the maximum amount of change in sea-level as estimated from the isotope curve is somewhere in the order of somewhat more than 100m, less than 200, certainly: general estimates of total sea level change since last glacial maximum (major most recent swing) are on the order of 115-120 m. All the smaller changes in the curve thus suggest sea level changes of a few tens of meters at most. Clearly this is a different order of magnitude than changes in the sea level curve, and this effect is pretty much negligible as compared to the much larger changes in paleodepth, thus (correctly) argued to be due to tectonic changes by the authors; nothing new there, and I see no support for the argument (lines 1-5, p. 124): However, it is clear that minor shifts in paleodepth are causally linked to global sea level changes.

The margin of uncertainty in the paleodepth estimates (Fig 2) appears to be VERY large, so I do not really see that the authors make a valid point when they say that the estimates for the most recent part of the paleodepth curve agree with present day depth of ~2.5 km: uncertainty appears to run from ~1300-5000m so that this curve can document changes in relative sea level of a few tens or hundreds of meters.

I do not quite understand the arguments regarding effects of global sea level change across the Mio/Pliocene boundary. At that time the sea level appears to go up by a few hundred meters at most on Eratosthenes. I can not understand how this could have any linkage to GLOBAL changes in sea level: if at that time the Mediterranean flooded after drying out to a large extent during the Messinian, than should not any sea level effects locally at Eratosthenes at least to some extent have been influenced by this flooding, rather than by any change in GLOBAL sea level?

The authors do not discuss the relatively large change in sea level at about 0.5 Ma, which appears much larger than many earlier changes.

The authors say that the oxygen isotope stack has an overall trend similar to that of paleodepth between 4.0 and 2.,5 Ma (lines 22-25, p. 122). I do not see a convincing

similarity in fig. 3b, and no statistical test of significance of this alleged correlation is presented.

I do not understand how figure 2 can agree with Table 1: in the figure there are many (~20 or so) species which have a upper depth limit of about 1300m. I see only 1 species in table 1 with an upper depth limit of 1300 m, not 20. Maybe the authors could have explained this by including the value of the 'dot' in figure 2, or if they had explained exactly how the data in fig 2 and table 1 can be compared (add species names in fig 2, maybe)?

What is the source of the data in Table 1? Each species should have a reference to where that depth estimate comes from, e.g. Hohenegger 2005, or one of the different sources given on p. 118, lines 18-25. This is important, because depth range may be different in mediterranean from elsewhere, as stated by the authors, and several species have in my experience not exactly that range (e.g. *S. complanata* ranges deeper in some locations).

Which species were eliminated from the estimate (p. 119, lines 1-4)? How many were eliminated? Any other (independent) evidence (e.g., damage to tests) that they had indeed been transported?

Overall, it does not appear to me that the authors have made the point that global sea level change has had any significant influence on the paleodepth at Eratosthenes Seamount.

I did not check all references, but the important reference by Hohenegger does not have the correct title and does not give page numbers. Typo in reference by Whiting (subsidence). Typo in name of *U. pygmaea*, table 1.

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