

Interactive comment on “A Global Compilation of U-series Dated Fossil Coral Sea-level Indicators for the Last Interglacial Period (MIS 5e)” by Peter M. Chutcharavan and Andrea Dutton

Barbara Mauz

mauz@liverpool.ac.uk

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I do appreciate this data compilation and the effort to update the Hibbert et al. (2016) database. I am wondering however, why Medina-Elizalde (2013; EPSL) was not referenced? Yes, it is true, when screening the existing data, Medina-Elizalde did not consider spike calibration and this may well have a significant impact on the accuracy of the ages used for inferring sea-level fluctuations. When looking at the screening protocol employed here, I do find the ‘flexible’ protocol only in the table and this means that age inaccuracies may also be part of the database. There is no mention on spike calibration in the text and the relevant column is empty. Expanding the limit of d234U value

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to 140-152 ‰ is a prudent decision. It reflects the desire to include more (or any?) data, given the general experience that the modern $d_{234}\text{U}$ value of 146.8 ± 0.1 ‰ (Andersen et al. 2010) is indeed hardly obtained. The unresolved bias in inter-laboratory comparison, as the authors put it rightly, is a key issue here. My concern here would be if age data generated on the basis of this approach are used to infer sea-level fluctuation(s) within the LIG time interval. I think the paper should make this very clear. One way to stress the implication of the flexible protocol would be to change the uncertainty of the age by adding a systematic error of 4% to the analytical error of the measurement where the 4% would reflect the $d_{234}\text{U}=146 \pm 6$ ‰ used here. It is good practice in dating techniques to account for known, but hard to quantify errors associated with the dating procedure, in particular when the age uncertainty is based on counting statistics only. With the sea-level fluctuation(s) in mind I would go even further. I think a new, updated database should address the uncertainty calculation in great detail by listing systematic errors (e.g., reference material, instrumental reproducibility), counting error and other analytical errors. In this way the bias in inter-laboratory comparison would be addressed and the age estimation would approximate what we do today already when estimating the elevation, i.e., summing up all errors associated with the value.

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