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Climate of the Past
Discussions

Interactive comment on "Orbital forcing of terrestrial hydrology, weathering and carbon sequestration during the Palaeocene-Eocene Thermal Maximum" *by* Tom Dunkley Jones et al.

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Following the reply to my short comment, I am content that the issue of the precise timing/definition of the CIE onset is well dealt with by his detailed response to Reviewer 1.

With regard to the presence of turbidites within the SU interval, I have no evidence to suggest that there are turbidites (at least that can be discerned by visual detailed sedimentological logging) within that part of the sequence at Zumaia, and also at a number of other sites worldwide (again see Clare et al., 2015). It is conceivable that there are very fine («1mm) turbidites that are masked by weathering effects (or have

been dissolved out post-deposition???), but I agree with Dunkley Jones' response that this cannot explain the c.0.5 m scale of Si/Fe cyclicity. There are turbidites within the PETM interval at the up-dip Ermua succession (see Schmitz et al., 2011; Fig 3; Clare et al; Fig 7), but their abundance is much reduced from periods prior and after the PETM, and they are thin calciclastic turbidites (Schmitz et al., 2011); hence that should not affect the Si/Fe response in the same manner as siliciclastic turbidites.

For these reasons, I am convinced by Dunkley Jones' response to my comment, and those of Reviewer 1 and Pujalte, that his method is robust. I would simply suggest that some short additional text is added to the manuscript to explain that:

1) the Zumaia Itzurun beach sequence does feature turbidites (as shown by several prior studies) in the sequence above and below the SU, but none (at least that are visually discernible) are found within the SU there. If they are there then they cannot explain the observed Si/Fe cyclically. 2) An up-dip sequence (Ermua) does show some fine grained thin calciclastic turbidites, but it is presumed that these flows did not reach the more distal Zumaia site, or if they did they are very thin indeed- and hence would not affect the conclusions of Dunkley Jones. 3) This therefore provides a strong argument for why Zumaia (as a distal basin) is a valuable site for this study of the CIE/PETM, and why slope apron, continental slope channel sites etc may provide more complicated stratigraphies.

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