

Interactive comment on “Astronomical Calibration of the Ypresian Time Scale: Implications for Seafloor Spreading Rates and the Chaotic Behaviour of the Solar System?” by Thomas Westerhold et al.

Anonymous Referee #3

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The manuscript describes an impressive effort to establish a coherent astronomically calibrated Ypresian time scale using new and previously published XRF, isotope, nanofossil and magnetic data from Walvis Ridge cores. I will restrict my comments to the paleomagnetic data and analysis, as this is my area of expertise. The processing of samples and data at the individual specimen level appears to be well done with no major issues. As previous workers have found, the interpretation of the data in terms of a magnetostratigraphy is more challenging. I don't necessarily object to the final interpretation, but my concerns lie in the lack of clarity in how the error bars were assigned and how the final magnetostratigraphy was selected. The authors are very

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vague on how this was done. There is no description of how error bars were placed on the beginning and end of each polarity interval (Fig. 2, Fig. 4). In some cases, the placement appears to be highly subjective. As one extreme example, it is stated in the text that there is no interpretable signal below 260 rmcd at site 1263, yet they identify polarity boundaries along with error bars within this interval (Fig. 2a). It is traditional to use a gray bar (instead of black or white) to denote intervals of ambiguous polarity. This might be helpful here to make it clear which parts of the record are truly unresolvable in the authors' opinion. It is also unclear how errors from each individual site were propagated into the final magnetostratigraphy and/or how this stratigraphy was decided upon. They merely say that it was “based on the integration of all data and evaluation of errors.” I think you need to be more explicit.

I was unable to find any of the supplementary tables, so I can't evaluate what's reported there. Perhaps the tables clarify how the final stratigraphy was selected?

In (main text) tables 1 and 2, I think there is an issue with the age and time units. The ages are reported in millions of years, but the uncertainty is reported in what? I assume that 47.723 Ma +/- 118 Myr is not accurate?

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