

Interactive comment on “Cross-continental age calibration of the Jurassic/Cretaceous boundary” by Luis Lena et al.

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See relevant comments on text General stratigraphic remarks Magnetostratigraphy, a key element in J/K definition, is lacking at the two sites described in this typescript. In the Andes, Las Loicas has no magnetostratigraphy, but Arroyo Lonconche does. The text should perhaps say that there is no possibility of magnetic calibration of Las Loicas with the many Tethaan sites where it has been documented; and, further, that the ammonite zonations applied at the LL and AL do not agree – a big problem. The calpionellid assemblage noted at Las Loicas is anomalous: such a mixed assemblage (with apparently derived Tithonain calpionellids) does not define or mark the base of the Berriasian. It should be made clear what is definitively lower Berriasian and what is not. The nannofossil literature cited as the justification for some of the text’s discus-

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sion and conclusions is rather old - Bralower and Casellato references are now 10 -30 years old. Many Tethyan sites have since been documented, and that make some of the species FADS and the zones discussed obsolete. Some Italian localities cited in the text are seen as anomalous in the positions of their nannofossil FADs. Thus it is not clear why these localities are selected by the authors for comparison with the LL and M sites, especially when they are not the best/most representative. The dating of the magnetozones needs to be highlighted and discussed at more length in the Discussion. Also, the assumptions (as seen in most publications) about using the magnetostratigraphic scale as a time scale could be laid out fully in the Introduction. It would help the reader if the authors could distinguish between ICS chronostratigraphic charts and others. Notably, Ogg et al 2016 is not at all 'official' and is not attributable to ICS, but this is not clear from the text. Structure Some of the material now in the Discussion should appear in the Introduction. The chronostratigraphic and biostratigraphic background should be made clear before consideration of any new data on radiometric dates. [As an aside, chronostratigraphy at the J/K boundary (or any other boundary) is not reliant on geochronology.] Correlations in the J/K interval has been advanced in recent years by the combination of magnetostratigraphy and calpionellid biostratigraphy, plus ammonites and nannofossils. The extrapolation of the GMPTS to onshore localities is central. The paper is concerned with attaching radiometric dates to a biostratigraphic framework. But it says very little about how radiometric dates match the timescale used by, for instance, Gradstein et al 2012: a time framework linked to the oceanic magnetostratigraphic record, the GMPTS. The last is hardly mentioned. This imbalance should be corrected. The core of the paper could usefully be a careful examination of the calibration of the dated ash horizons and the levels with the key biostratigraphic markers – listing them in sequence, level by level. At present, the text does not give such a clear description. Precision, accuracy, meaning, English language There are numerous examples of rather problematic phrases and sentences which are not written in good English. But more critical is the lack of precision or looseness in language and terminology. This lets down the submission very badly. It is the thing that

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needs most attention in a revision by the authors. The factual content of the paper is currently often undermined casual wording, and lack of focus on the essential elements in the data, or rather feeble or vague discussion of the facts (numerous markings on the text). Attention to biostratigraphic/chronostatigraphic accuracy are recommended for a revision: the text would then do justice to the new data being presented The loose wording of the Abstract's and Introduction's first sentences. No, the age of the J/K boundary is very clear. Lena et al. talk only about radiometric dating. They should say that the start of Berriasian age/base of Berriasian stage has been more or less fixed for some years [the authors actually quote several relevant papers that show this]. The typescript describes 'absolute' dates that are useful in constraining the boundary, or at least the boundary interval: it is such radiometric dates that have been lacking. Thus, the chronostratigraphy is clear, but sound geochronology is new. Repetitions could be removed. Every time a site is mentioned it is always "in the xx section". At A and at B would be welcome change for the reader. There are lots of alternative words to section: outcrop, exposure, profile, "JKB" is not standard terminology. It appears hundreds of times in the text. "J/K boundary" is the norm. Alternatives for use are: the base of the Alpina Subzone, base of Berriasian Stage, Tithonian/Berriasian boundary, or, less precisely, the J/K interval, the boundary interval. Care is required is using the phrase J/K boundary. Anything that is not exactly correlated with the base of the Alpina Subzone can be said to be in the J/K interval, but not at the boundary. The reader is sometimes not sure what interval is referred to, or what horizon. Many times a fossil or date is somewhere in the J/K interval, but, to be accurate, nowhere near the actual boundary. Frequently, fossil names are incorrectly spelt. Also - palaeontology, metre. Verb is to "crop out" not to "outcrop".

Conclusion I recommend this text for publication after substantial improvement. The underlying data is sound, but the structure of the account and, even more, the prose are in need of work. The description and the discussion do not do justice to the factual content.

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Please also note the supplement to this comment:

<https://www.solid-earth-discuss.net/se-2018-57/se-2018-57-RC1-supplement.pdf>

Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2018-57>, 2018.

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