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Solid Earth Discussions

Interactive comment on "Ammonoid multi-extinction crises during the Late Pliensbachian – Toarcian and carbon cycle instabilities" *by* J. Guex et al.

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The Pliensbachian Toarcian history is highly complex from many point of views: Evolutionary crises related to major ecological disturbances, climatic changes from ice-house to super-greenhouse, eustatic sea-level changes, probable relationships between these events and the Karoo magmatism. In the original version of our paper, we try to illustrate these imbricated historical pattern by referring to them in a somehow intricated way. This induced some confusion to the reviewer and we managed to restructure the text to avoid that problem.

It should also be stressed that we proceded to a new correlation between the Toarcian

of the Pacific Realm and the classical NW European ammonite zonation. Our new curve is correlated to the ammonite zonations thanks to totally new biostratigraphical data: the ammonites discovered in the Palquilla section are found for the first time in Peru. It is thanks to these new precise ammonite data that we can be certain of the ages of the different negative trends observed in the d13C curve. In general, the absence of biochronological control over an isotope curve leads to false age assignments (see below: the case of the "chaotic" carbon excursions near the Triassic Jurassic boundary).

More details about the comments of Reviewer 1: 1) it is crystal clear in our original text the we do not confuse the small CIE at the Pliensbachian – Toarcian boundary (ice house conditions) and the main lower Toarcian CIE (greenhouse conditions). 2) the diagenesis problems have been discussed with more detail in the revised ms. Korte and Hesselbo's paper has been added in the references. 3) the hiatus at the Pliensbachian Toarcian boundary is obvious in the Palquilla section: this is discussed in our text. 4) Svensen 2007 explains the lower Toarcian anoxic event by the metamorphism of organic rich sediments in the Karoo dated 182.7. In the reference requested by reviewer 1 Svensen 2009 makes no reference to the problem of U-Pb dating of the Toarcian OAE. 5) Cecca and Macchioni 2004 : we quote their work of 2002 where the double extinction is already discussed but we have also added the 2004 reference.

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