

Interactive comment on “Drilling disturbance and constraints on the onset of the Paleocene/Eocene boundary carbon isotope excursion in New Jersey” by P. N. Pearson and E. Thomas

S. J. Gallagher (Referee)

sjgall@unimelb.edu.au

Received and published: 10 November 2014

This is a very interesting technical review of the sampling of an important section preserving the Paleocene/Eocene boundary event. A critical period of time associated with a significant carbon isotopic excursion (CIE). The issue investigated by this contribution by Pearson and Thomas centres on the relative timing of this excursion and how this is recorded in the Marlboro Clay in New Jersey. If the event was near instantaneous (13 years) according Wright and Schaller (2013) due a meteorite impact or volcanism causing methane release or if it was “rapid” in the order of millennia with other causes such as the release of methane due to ongoing volcanism, organic sediment oxida-

C1886

tion and melting of permafrost among (among other causes coherently reviewed by Pearson and Thomas in the MS).

As a response to Wright and Schaller (2013) and working with these authors Pearson and Thomas have comprehensively reviewed the stratigraphic and geological evidence of the rapidity of this event. Pearson and Thomas convincingly illustrated evidence of significant disturbance of the cores where “biscuiting” has occurred. When one looks at the original core photos (Fig 1) presented by Wright and Schaller, the regularity of this disturbance and presence of mud smearing as described by Pearson and Thomas suggests a mechanical cause for these ‘cyclic’ sediments. Comparisons with other sections in Tanzania illustrate the pervasiveness of this drilling artefact. In fact this feature is a typical outcome of coring semi-consolidated mudrocks.

This is as useful well-written technical contribution to the debate on this key PETM section and notwithstanding the problems of the interpretation of Wright and Schaller (2013) it is important to follow up their work on the New Jersey Marlboro clay with further careful drilling, sampling of outcrop and integrated analyses.

Interactive comment on Clim. Past Discuss., 10, 3303, 2014.

C1887