

# ***Interactive comment on “Maastrichtian carbon isotope stratigraphy and cyclostratigraphy of the Newfoundland Margin (Site U1403, IODP Leg 342)” by Oliver Friedrich et al.***

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The authors present a new isotope- and cyclostratigraphy of the upper Maastrichtian from the W. North Atlantic. Geochemical data, based on XRF –Scanner analyses, were used for the establishment of a new cyclostratigraphy, C-isotopes were used as a chemostratigraphic tool, oxygen isotope data were interpreted as a proxy for paleotemperature. The paper is well written, data are clearly presented and a comparison with data from the Zumaya section broadens the contents of the paper and it provides information on correlation potential of the new data set. In the following paragraphs I add a few comments which may help to further improve this manuscript: (1) Not everybody is familiar with the details of Maastrichtian stratigraphy. A graph showing the state

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## Interactive comment

of the art in Maastrichtian bio- and chemostratigraphy (and magnetostratigraphy) and highlighting the interval which is studied by this research group will be very useful. (2) Chemostratigraphy: Again, the authors chose the short upper Maastrichtian interval in their correlation graph, it would be easier to read the correlation, if a longer segment of the the Zumaya curve would be shown, starting, for example, at the Campanian-Maastrichtian boundary (with corresponding CIE). This graph would further indicate that the observed fluctuations in the Upper Maastrichtian record are mostly of very small amplitude. It is not surprising, that fluctuations around 0.2permil or even less are not of any reliable use in chemostratigraphy. The authors correctly mention the importance of regional factors controlling this isotope pattern. Here, reference to variations in the isotopic composition in modern oceans could/should be made. (3) Oxygen isotopes – the oxygen isotope data are, correctly, used as a proxy for paleotemperature and the authors correctly point at possible alteration during diagenesis (all limestones/chalks consist, by definition, of original marine calcite and of cement formed during burial diagenesis). However, the authors may make a comparison with other oxygen isotope data sets from the literature and they may even comment of ranges in paleotemperature calculated from them in comparison with other data, assuming that, despite of diagenesis, the pattern of change is still preserved. Another question concerns the impact of changing lithologies on the oxygen isotope pattern. Do samples with lower carbonate content show any lithology-related changes in carbon or oxygen isotope composition? Did you make a carbonate content – oxygen isotope data cross-plot? This plot does not have to be published, but you may mention, if any correlation between carbonate content and oxygen isotope composition is recognized. (4) A summary graph showing the new isotope data within a larger set of data from different localities could nicely round up this paper.

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