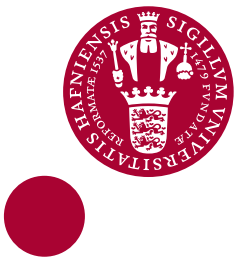

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*Published in:*
Geophysical Research Abstracts

*Publication date:*
2019

*Document version*
Publisher's PDF, also known as Version of record

Geophysical Research Abstracts
Vol. 21, EGU2019-14038, 2019
EGU General Assembly 2019


# An imprint of astronomical climate forcing in the Baltoscandian Middle Ordovician 'orthoceratite limestone'?

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The Middle Ordovician (∼460-470 Ma) in Baltoscandia is mainly represented by the so called 'orthoceratite limestone'. This is a geographically wide-spread condensed sedimentary succession of a few tens of meters thickness consisting of fine-grained limestones deposited at middle paleolatitudes. These successions have a long history of detailed litho- and biostratigraphical research, which in recent years is complemented with chemostratigraphical investigations (mainly stable carbon isotopes). New mm-resolution XRF elemental core scanning data from the Tingskullen-1 and Kårehamn P4 cores from the island of Öland, Sweden, reveal the potential to further test the hypothesis of the presence of Milankovitch scale cyclicity in these records. This new high-resolution data also resolves the regular occurrence of hardgrounds in this 'orthoceratite limestone', as for example expressed in minima in carbonate content and peaks in detrital elements. These dissolution surfaces have been suggested to be related to carbonate production-dissolution alternations. It is interesting that many of the relative changes in the elemental profiles seem to be related to these dissolution horizons and show a certain regularity in occurrence on different spatial levels. The ratio between the different periods, in combination with specific patterns of amplitude modulation - both visually and statistically inspected - suggests the presence of a precessional scale variability, bundled in eccentricity cycles. Besides the existing integrated stratigraphical framework, these interpretations can be tested by ongoing geochronological work (CA-TIMS U-Pb dating of zircons from volcanic ash layers present in these successions). The prospective of building an astronomical timescale for the Middle Ordovician can shed new light on its climate dynamics and associated tempo and duration of important events such as the Great Ordovician Biodiversification Event (GOBE) and the middle Darriwilian carbon isotope excursion (MDICE).