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Late Triassic cyclostratigraphy of the vertebrate-bearing lacustrine succession in the Jameson Land Basin, East Greenland

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The Jameson Land Basin in East Greenland contains a well-exposed Late Triassic lacustrine succession in the Fleming Fjord Formation. These lake deposits have been subject to numerous stratigraphical, sedimentological and paleontological studies since the late 1970's and contain an abundant and taxonomically diverse vertebrate fauna, including dinosaurs, early mammaliaforms, phytosaurs, an aetosaur, a pterosaur, fishes, amphibians and turtles. All stratigraphic units in the Fleming Fjord Formation display a cyclic bedding mainly consisting of fine-grained siliciclastics and carbonates punctuated by siltstone and sandstone beds. Former studies reveal at least three orders of sedimentary cycles suggesting orbital control on sedimentation. This overall cyclic dominance of the sedimentation suggests that orbital forcing is a key factor in the paleoclimatic and paleoenvironmental history of the paleolakes.

The composite cyclicity of the Fleming Fjord Formation has predominantly been superficially studied, mostly with visual inspection. Only a small interval in the upper part of the unit has been analyzed more thoroughly using a range of geochemical analyzes. The aim of this study is to strengthen the cyclostratigraphic interpretation of the vertebrate-bearing lacustrine sediments of Fleming Fjord Formation with special emphasis on a red-bed succession in the upper part of the unit (the Carlsberg Fjord Beds). Multiproxy geochemical analyzes, environmental magnetism, and detailed sedimentological descriptions are combined to examine the cyclicities and reconstruct changes in the lacustrine environment. The geochemical and magnetic analyzes are a work in progress but aims to improve the estimated quantity and duration of the cyclicities. Sedimentary structures within siltstone and sandstone beds are used as additional climatic proxies (as indicators of clastic supplies to the basin during increased rainfall) and wave-ripple orientation (as indicator of the ancient wind climate).