Cyclo and chemostratigraphic characteristics of the Middle Silurian in Gotland, Sweden

M.C.M. Arts1, B. Cramer2, M. Calner3, C. M.Ø. Rasmussen45, A. M. Bancroft5, S. C. Oborny2, E. Hartke2,

E. Biebesheimer₂, A.C. Da Silva₁

Sedimentary Petrology, Geology Department, Liège University, Belgium corresponding author: michiel.arts@uliege.be ² Earth and Environmental Sciences, University of Iowa, U.S.A.

Introduction

The Silurian Period which was once thought as warm and climatically stable time interval is in fact punctuated by numerous paleoenvironmental perturbations or events. These Silurian events follow a similar pattern where an extinction event precedes a carbon isotope excursion (Jeppsen 2000 & 1997). Many theories have been brought forward to explain these events ranging from glaciations, to changes in precipitations patterns, ocean currents, volcanism induced ocean anoxia and SEDEX formation. Constraints on the duration and timing of these extinction events are weak, which hampers a full understanding of the processes at play. The Altajme well drilled in South Central Gotland in Sweden in 2015 spans the latest Ordovician to Homerian succession of Gotland. The data from the Altajme core provides us with a unique opportunity to look at climatic perturbations during the Silurian. The Altajme core spans both the Sheinwoodian Ireviken event and the Homerian Mulde event. The Altajme core dataset includes a litholog, high-resolution $\delta 13C$ data, correlated bentonites with U-Pb dates and a new highresolution XRF core scan. The new high resolution (0.5-1cm resolution) XRF-dataset was gathered in December 2019. The δ13C data in combination with the high resolution XRF scan gives us insights into the changes in the ocean before during and after the events, while the XRF data and U/Pb dated bentonites give cyclostratigraphic age constraints for the events and for core as a whole.











