Dear Participant of the Cyclostratigraphy Intercomparison Project (CIP),

First of all, thank you for your interest in this project.

The main goal of this project and the 3-day workshop (30/07/2018-01/08/2018 in Brussels) is to test reproducibility, and to some extent also standardization of results and uncertainties in the field of cyclostratigraphy. This requires the analysis of 3 artificial geological case studies by multiple individual researchers. The idea is that every researcher works independently. All participants are free to determine their method of choice; however, a handful of criterions will be required as an outcome must be comparable. The different results will be compared and even more importantly, their pathways and resulting (in)accuracy will be discussed.

Participation in this project in possible in several ways:

1) Join us at the workshop (minimal condition: analyze at least one, preferentially more, case study and submit the results before 01/07/2018 + pay registration fee + email with expression of interest).
2) Analyze and submit results on one or more records. To be considered as a co-author in a potential review-style publication without participation to the workshop, all three artificial case studies have to be studied and submitted before 01/07/2018 (independently per participant!).

The registration and the form to submit your results will be opened the week after EGU 2018 (Mid April). At the EGU meeting, there will be a poster presentation on the case studies (Friday 13/04, 17h30-19h00, SSP2.1., X1.279) providing the opportunity to discuss the case studies and explain potential ambiguities.

The input data for the case studies can be accessed on the following Dropbox folder:

https://www.dropbox.com/sh/aa5ywlyibujw8uk/AADmNFJpdCDLV8R5KlUJSTgea?dl=0

Submitting your results is possible through the following Google form:

https://goo.gl/forms/TkLwU5DGMUtC916A3

For each case study certain questions are formulated. Answers to these questions will be asked in the form. Some answers are obligatory, other are not. At the end of the form you will be given the opportunity to send any feedback or additional files you would like to share (e.g. explaining your methodology, Tables containing age models, Documents elucidating your cyclostratigraphic results, Figures illustrating your strategy…). Please send those files to Matthias Sinnesael.

Identification is necessary for quality control, but all data will be treated confidentially. A selection of the CIP scientific committee (MS, DDV and CZ) will treat your submitted results anonymously at all time, and never link specific results to participants of the workshop.

Good luck!

The CIP-team

SIGNAL 1

During the summer of 2027 IODP Expedition 666 “Prelude on the Messian salinity crisis” successfully recovered a complete and continuous core. The core has a total length of 26.38 m and exists of pelagic carbonate-rich sediments which look cyclic. Correlations based on seismic profiles and biostratigraphy suggest that the core contains the Tortonian-Messinian boundary around 15-20 m core depth and does not contain any Pliocene material.

As the only shipboard cyclostratigrapher you are asked to look at the color record of the full core and provide following output to the expedition stratigraphic correlator:

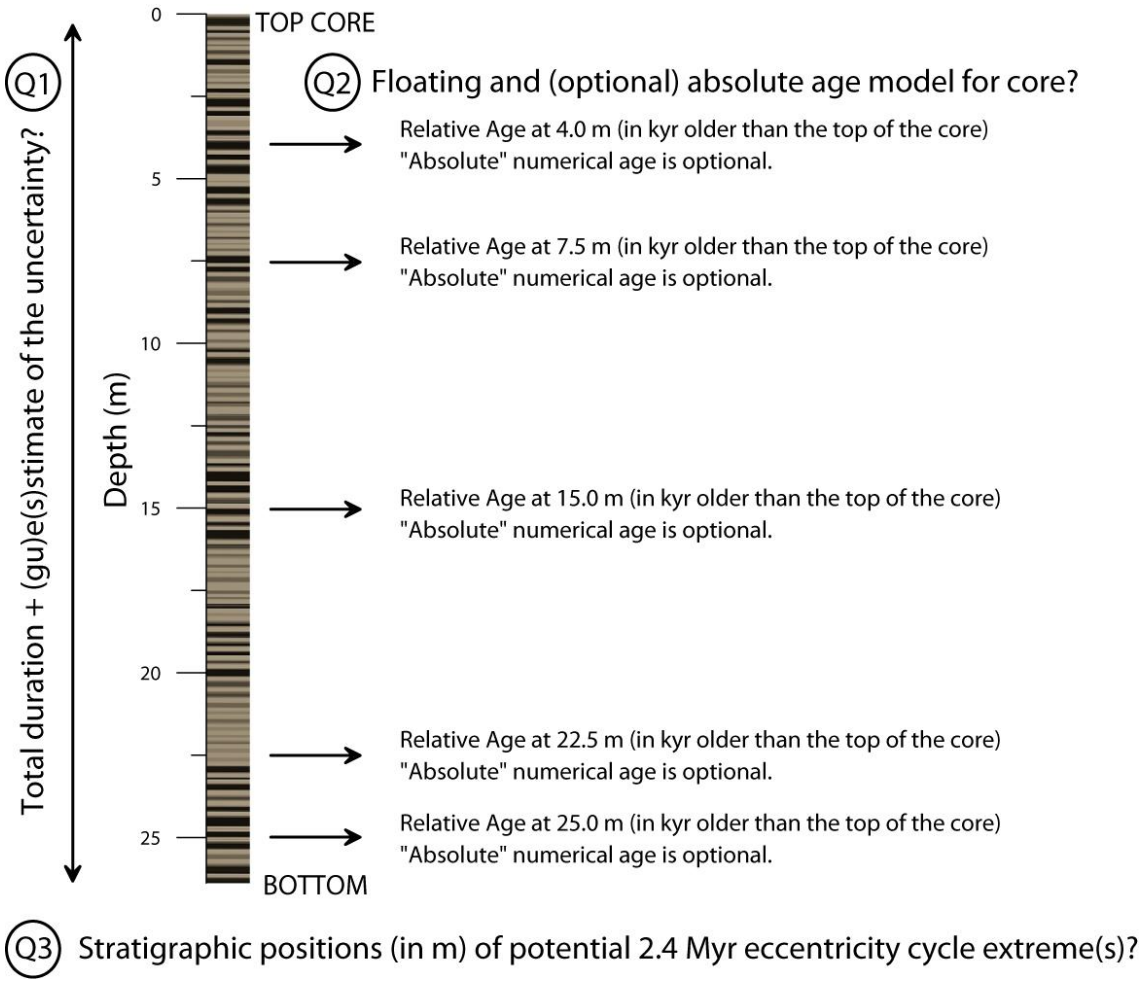
Q1: A best estimation on the total duration (in kyr) of the recovered core based on cyclostratigraphy. What is the uncertainty on this estimation? Do you suspect the presence of any hiatus(es)?

Q2a: A floating age model for following core depths: 4.0, 7.5, 15.0, 22.5 and 25.0 m. [0m = 0 kyr]. What are the uncertainties on these?

Q2b: Optional: an absolute age model for the same core depths (Tuning). Uncertainty?

Q3: Stratigraphic positions (in m) of potential 2.4 Myr eccentricity cycle extreme(s)? Uncertainty?

Data: Information from the introduction and a TIF format color image (Signal_1) of the core (also in separate file).



SIGNAL 2

During the IODP Expedition 999 “Quaternary High Latitudes”, a core showing quasi-cyclic variability in proxy data was recovered. The topmost (and thus most recent) sediment is missing for unclear reasons. It is also not clear how much sediment and time is missing. The core has a total length of 10.00 m, and exhibits pattern which seem cyclic. You have a quickly measured record of the magnetic susceptibility (signal origin unclear, but somehow related to paleoclimate/paleoenvironment). Investigation of the biostratigraphy suggests the core to represent sediments with a maximal age of 2 Ma and a minimal age of 0.5 Ma, spanning a maximum time of 1.5 Myr.

As cyclostratigrapher you are asked to look at the proxy record of the core, and provide following information:

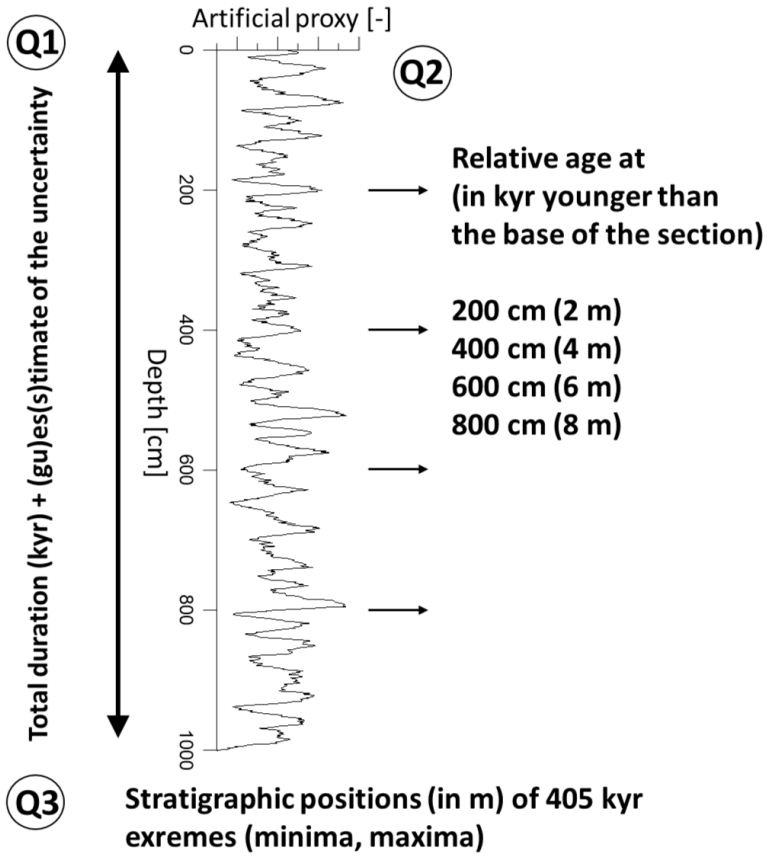
Q1: A best estimation on the total duration (in kyr) of the recovered core based on cyclostratigraphy. What is the uncertainty on this estimation? Do you suspect the presence of any hiatus(es)?

Q2a: A floating age model containing for following core positions: 2.0, 4,0, 6.0, 8.0 m. What are the uncertainties on these?

Q2b: Optional: an absolute age model for the same core positions (Tuning). Uncertainty?

Q3: Stratigraphic positions (in m) of potential 405 kyr eccentricity cycle extreme(s)? Uncertainty?

Data: Information from the introduction and an Excel data file (Signal_2) of the record (also in separate file).



SIGNAL 3

A team of motivated master students generated a high-resolution (15-cm spaced) proxy record of a 394.5 m thick Late Devonian section in Australia, entirely Famennian in age. The section was deposited in an external carbonate ramp setting. The conodont biostratigraphy of this section is known from the literature, and was constructed based on 40 conodont samples at 10-meter intervals throughout the entire section.

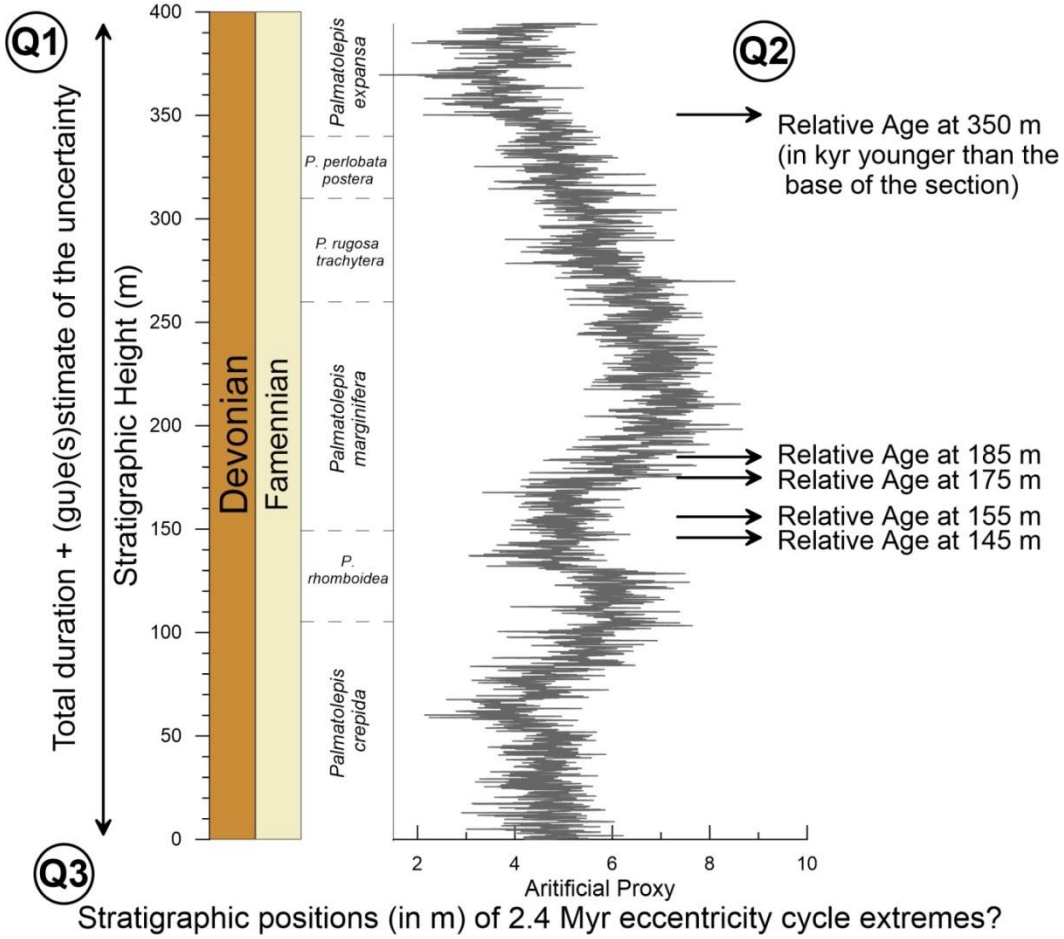
Your master students took off to other adventures, and you are left with this exceptionally high-resolution proxy record for the Famennian. Can you distill a cyclostratigraphic story for your next paper?

Q1: A best estimation on the total duration (in kyr) of the recovered core based on cyclostratigraphy. What is the uncertainty on this estimation? Do you suspect the presence of any hiatus(es)?

Q2: A floating age model for following stratigraphic levels: 145.0, 155.0, 175.0, 185.0, 350.0 m. Output is asked in age, younger than the base of the section. [0 m = 0 kyr]. What are the uncertainties on these?

Q3: Stratigraphic positions (in m) of potential 2.4 Myr eccentricity cycle extreme(s)? Uncertainty?

Data: Information from the introduction and a CSV data file (Signal_3) of the record (also in separate file), as well as Fig. 22.10 from the Geological Time Scale 2012, p. 573 (ed. Gradstein et al., 2012) which contains a Late Devonian biostratigraphical framework.



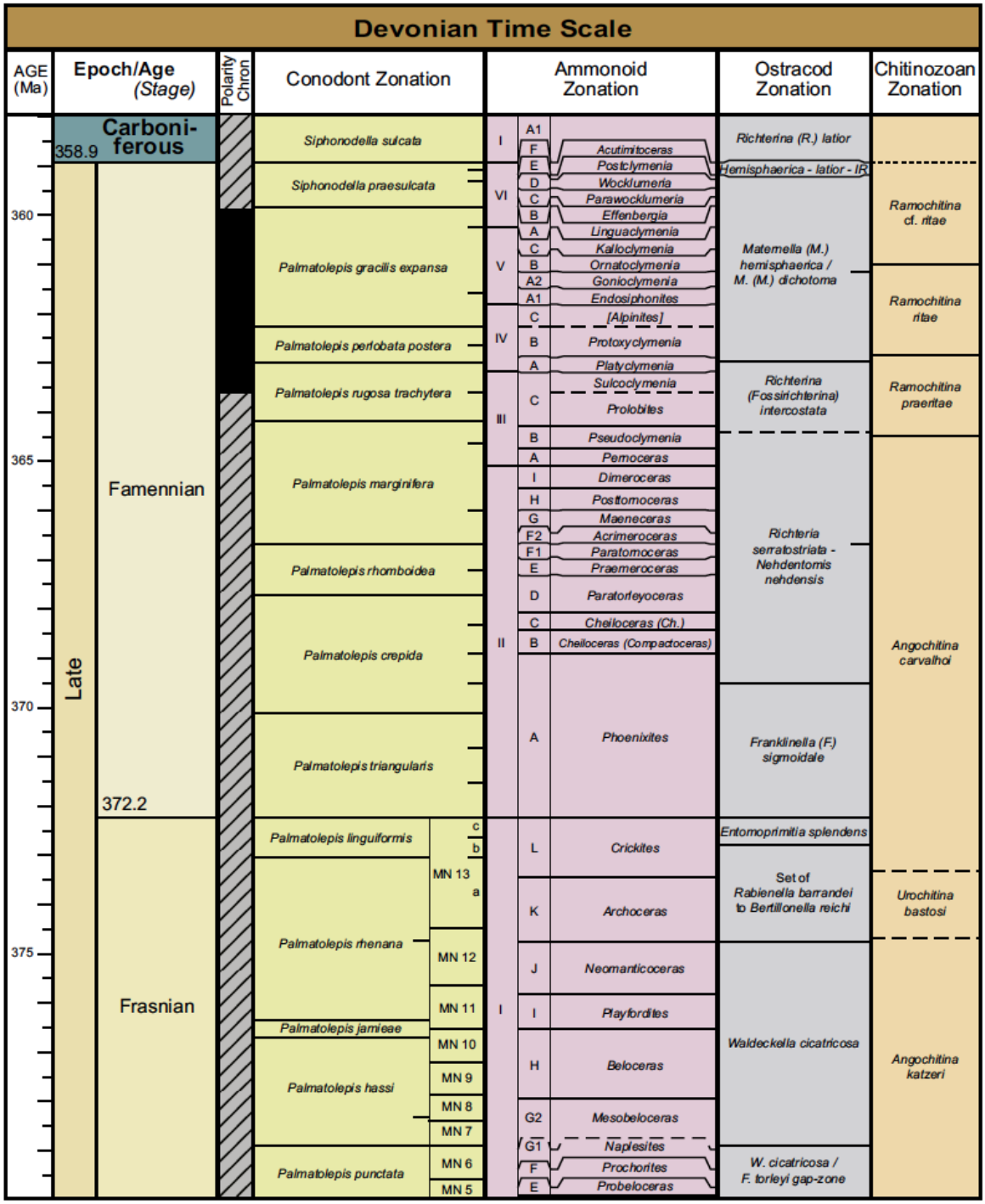


FIGURE 22.10 **Devonian chronostratigraphy and major marine biostratigraphy**. Biostratigraphic scales include conodonts, ammonoid zonation with selected guide taxa, graptolites (in the Lochkovian/Pragian), entomozoid ostracods, dacryoconarids and chitinozoans. Details are given in the text, and in House (2002) and Bultynck (2000a,b).