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Numerous bioevents prior the end Triassic mass-extinction co-occur with a stable carbon cycle under orbital control

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We established a new high-resolution carbonate isotope record from the lower Norian to the late Rhaetian in the Northern Calcareous Alps in Austria. The new curve has an excellent biostratigraphic control based on ammonoids and conodonts. The middle Norian to lower Rhaetian is composed of Hallstatt-type limestone. The following Zlambach Formation is represented by alternating marls and micritic limestone, episodically overlain by allodapic carbonate. The Zlambach sequence was deposited in a toe-of-slope to basin environment. The carbon isotope curve display a gentle decrease from the late early Norian (3.5‰) to the base of the Rhaetian (1.8‰) with two accelerated steps, in the middle Norian and just after the Norian-Rhaetian Boundary. This last 1‰ decrease corresponds however to a change in lithology. The values show then a small increase during the early Rhaetian, with a maximum in the middle Rhaetian (at 2.4‰). The general stability of the curve even through the different Late Triassic bio-events describes a stable oceanic structure prior to the mass extinction.

Superposed to this long-term trend, the $\delta^{13}C$ isotopic curve in the Zlambach Formation records distinctive cycles. Results of the spectral analyses reveal 400 kyr. cyclicity, which correlates with Milankovitch long eccentricity changes. Cycles occurring in our record suggest that a link between orbital forcing and carbonate cycling existed in the Late Triassic time. These 400kyr cycles in the Late Triassic could have been linked to sea-level changes influencing the carbonate export from the platform or, as during the Cretaceous, be related to a fluctuating monsoonal regime.