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Salt tectonics controls on carbonate platform growth (Northern Calcareous Alps, Austria)

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Mid Triassic carbonate platforms in the Northern Calcareous Alps (NCA) grew diachronously on the Neo-Tethys shelf beginning in the Middle Anisian and ending in Lower Carnian times. The platforms grew isolated and developed out of deeper marine conditions. Calculated growth rates are high, reaching 1.5 to 2mm per year in order to accumulate the observed thicknesses of 1500 to 2000 m in relatively short time spans (1-2Myr time).
Based on field observations, cross-section construction and subsidence analysis of selected mini-basins, we propose a mechanism for the rapid growth of Mid Triassic isolated carbonate platforms based on salt withdrawal. Within a general deep-water environment, carbonate platforms start to grow only on wide zones of inflated salt. Once the inflation of salt elevates a pre-kinematic layer of deeper marine carbonate to the photic zone, carbonate producers create the first layers of reefal/lagoonal carbonates. A feedback loop of carbonate growth (creating a load gradient) and subsidence by salt evacuation initiates. An initial phase of fast carbonate aggradation ends once the salt below the platform is fully evacuated and primary welding takes place. From this point onward, lateral progradation of the platform is postulated.
This mechanism of self-controlled growth of carbonate systems on salt allows a completely new perspective to understand a number of long-standing discussions of the NCA carbonate platforms, such as the accumulation of thick carbonates (>1.5 km) without basement faulting, the isolated growth of platforms, or the transition of aggradational to progradational growth (as observed in the in the NCA as well as in the Dolomites) and can potentially shed light into other salt-controlled carbonate systems developed on rift to passive margins basins.