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# Dynamic Evolution of Marine Chemistry during the Mid-Ludfordian Glaciation and the late Silurian Lau/Kozlowskii extinction events

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The Silurian was one of the most climatically unstable periods of the Phanerozoic as evidenced by several large positive carbon isotope excursions (CIEs) associated with extinction events. The primary triggers of these globally recognized CIEs and their links to the global carbon cycle and/or coeval changes in paleoenvironments, paleoecosystems, and palaeoclimate remain highly disputed. Attempts to test various hypotheses on the origin of the CIEs have been hampered by the lack of combined high-resolution geochemical/isotopic data and detailed sedimentological, paleontological, and biostratigraphic records from the same section.

One of the largest Phanerozoic CIEs, the mid-Ludfordian CIE (MLCIE; +8 to +12‰ in $\delta^{13}C_{carb}$), was associated with the Mid-Ludfordian Glaciation, both recorded from different regions located in temperate as well as tropical paleolatitudes [1]. The MLCIE was preceded by a globally recognized sea-level fall and the Lau/Kozlowskii extinction events. Based on new and published high-resolution geochemical records ($\delta^{7}Li$, $\delta^{13}C_{carb}$, $\delta^{13}C_{org}$, $\delta^{18}O_{apatite}$, $\delta^{34}S_{py}$, $\delta^{44/40}Ca$, $\delta^{53}Cr$, $^{87}Sr/^{86}Sr$, $\delta^{138}Ba$, $^{187}Os/^{188}Os$, and redox-sensitive trace elements, [1,2,3,4]) from the Kosov section (Perunica, peri-Gondwana), which represents one of the most complete and well-studied MLCIE sections with detailed sedimentological, palaeontological and biostratigraphic records in the world, we explore the links between the evolution of marine chemistry and coeval changes in palaeoenvironment, palaeoecosystems, and palaeoclimate.

[1] Frýda et al. (2021), *Earth-Science Reviews.* **220**, 103652. [2] Frýda et al. (2021), *Palaeo3*. **564**, 110152. [3] Sproson et al. (2022) *Earth and Planetary Science Letters,* **577***,* 117260. [4] Zhang et al. (2022) *Earth and Planetary Science Letters.*