Climate change and U isotope excursion during Carnin Event in South China

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The Mid-Carnian Event (MCE) is the most significant climatic event of Triassic period, with dramatic changes recorded in sedimentary records from many different regional basins. However, many key aspects of the MCE remain unknown, including the precise timing, duration, global extent, and triggering mechanism. Here we provide a high-resolution U isotope record from marine carbonates spanning the Carnian stage in South China in order to characterize changes in global marine redox conditions associated with the MCE. Our $\delta^{238}U$ record reveals that the late Julian was characterized by persistently low $\delta^{238}U$ values (averaging ~ -0.4‰). A positive shift is observed at the MCE, followed by a rapid shift back to relatively low $\delta^{238}U$ values in the Tuvalian. A simple U isotope mass balance model suggests the global area of anoxic seafloor expanded substantially during the late Julain, which might explain the biotic crisis at this time. However, the area of anoxic seafloor likely contracted sharply in the early Tuvalian. Our $\delta^{238}U$ record shows a good first-order correspondence to the published conodont apatite $\delta^{18}O$ curve. Peak anoxia and its subsequent sharp decrease coincided with the late Julian hyperthermal event and the following cooling of SST, respectively. We hypothesize that the Wrangellia LIP eruption was the trigger for the MCE. The temperature of the atmosphere and sea surface rose, which may have affected ocean circulation or influenced primary productivity. We are currently exploring other sections to verify the global nature of these trends.