# Insights into the end-Permian mass extinction from high-precision U-Pb geochronology: progress and future prospects

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The last two decades have witnessed a surge in the investigations of the end-Permian mass extinction (EPME) aimed at unravelling the cause(s) of the most severe biotic crisis in the Earth history. Radioisotopic geochronology has played a pivotal role in this quest by providing invalubale insights into the tempo and rates of extinction. High-precision U-Pb geochronology by the modern CA-ID-TIMS method, in particular, has made it possible to constrain the EPME and associated events with an age resolution of 30 kyr or better. Age constraints based on the latter technique now form the basis of a well-established temporal link betweent the Siberian Traps large igneous province and the EPME, although the exact kill machanism remains inadequately understood. Recent high-resolution geochronologic studies point to the remarkable synchroneity and universal abruptness of the EPME throughout the marine realm.

Another contribution of high-precision U-Pb geochronology has been the identification of marine Permo-Triassic bounbdary (PTB) successions that are stratigraphically far more expanded compared to the extensively studied GSSP section at Meishan in eastern China. Our new results from the PTB platform succession at Penglaitan in South China reveal a detailed record of invertebrate fossils, oceanic carbon cycle, oxidation state and paleotemperatures that is >100 times more expanded than the same interval at Meishan. Despite its remarkable expansion, the Penglaitan record shows no evidence of decline in biologic diversity or early signals of ecological collapse prior to an abrupt extinction pulse. Further detailed investigations of extended PTB successions, as well as links between the marine and terrestrial extinctions, are necessary in order to shed light on the possible mechanism(s) of the EPME.