



## **Continental temperature change during Early Eocene hyperthermal events**

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Carbonate clumped isotope thermometry has great potential for solving long-standing questions in paleoclimatology as it provides temperature estimates that are independent from assumptions regarding the isotopic or elemental composition of water from which the carbonate precipitated. The clumped isotope group at ETH has worked towards decreasing the sample size requirements and derived new calibrations for the Kiel method based on synthetic and natural calcites. Here we present results of clumped isotope based continental temperatures across the Paleocene-Eocene Thermal Maximum (PETM). The Bighorn Basin of northwestern Wyoming provides hundreds of meters of excellently exposed river floodplain strata of Paleocene and early Eocene age. Records of the the largest greenhouse-warming episode in this interval of time, were recovered soon after their discovery in deep marine sediments. This has allowed intensive study of the major impact this greenhouse warming event had on continental interior climate. Recently, records of four successive, smaller, transient greenhouse warming events in the early Eocene - ETM2/H1/Elmo, H2, I1, and I2 - were located in the fluvial rock record of the basin. We show that the (summer) temperature excursions during hyperthermal events in continental mid-latitudes were amplified compared to marine temperatures and proportional to the size of associated carbon isotope excursions.