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## **Cenozoic climate evolution revealed by clumped isotope thermometry**

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When it comes to paleoclimate data-model integration, temperature is arguably the most important parameter. Although a range of temperature proxies has been developed over the decades, many of the available methods suffer from large calibration uncertainties, in particular when applied on deep-time intervals. Clumped isotope thermometry is based on thermodynamic principles and therefore can provide accurate temperature constraints for the deeper geological record. Recent analytical developments allow now the analysis of relatively small sample sizes and the application in paleoceanographic studies becomes more feasible. I will present new clumped isotope based temperature estimates for the Atlantic deep-sea across the Cenozoic. I will also show that the analysis of small samples now allows us to even resolve seasonal sea surface temperature estimates from high-resolution archives. Deep-sea temperatures as well as seasonally resolved surface temperature estimates are particularly useful for data-model comparison.