Boron based reconstruction of atmospheric CO_2 during the Plio-Pleistocene

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In the context of present global warming, understanding the response of climate to changes in atmospheric CO_2 is an urgent requirement. Investigating past climate conditions is necessary to explore how climate responded to CO_2 variations close to modern levels. To exploit this palaeoclimate archive, we need reliable methods for reconstructing CO_2 beyond the ice-core record into intervals during which global warmth approached that projected for the future (such as the warm Pliocene and the Early Eocene Climatic Optimum). The boron isotope proxy applied to foraminiferal calcite is one of the most promising proxies for reconstructing past CO_2 but it has been validated against the ice-core CO_2 record only in a few locations and at limited temporal resolution (typically lacking the full orbital cycles). The first step of this study is to rigorously test the performance of the boron isotope-CO_2 proxy against the ice-core record where past CO_2 is known with high confidence. Secondly, we aim to reconstruct CO_2 over a key period of global warmth: the mid Pliocene from marine isotope stages M2 to KM3 (3300-3150 ka). We present results of CO_2 data calculated from boron isotopes measured on the planktic foraminifer *Globigerinoides ruber* at different locations (ODP 871 and ODP 999) with the aim of generating a multi-site, sub-orbitally resolved boron isotope-based CO_2 record for the Plio-Pleistocene.