# Seawater Ca and stable Sr isotope records during Pliensbachian – Toarcian boundary

Q. LI*[1], M. F. THIRLWALL[1], J. M. MCARTHUR[1]
[1]Dept. of Earth Sciences, Royal Holloway Univ. of London, Egham, Surrey, UK. qiong.li@rhul.ac.uk

Marine biogenic calcite has been used to reconstruct the Ca and Sr isotope profiles in seawater over geological time owing to their resistance to diagenesis. The two systems show similar secular trends over the Phanerozoic and may be controlled by similar processes [1-4]. Nevertheless, short-term variations of these records have only had speculative explanations [e.g. 1, 4]. Using belemnites, we profile seawater Ca ($\delta^{44/40}$Ca) and stable-Sr isotopes ($\delta^{88/86}$Sr) across the Pliensbachian – Toarcian (P-T) boundary of the Peniche, Portugal, to investigate reports of rapid, short-term variations in the former and its cause [5].

Values of marine $^{87}Sr/^{86}Sr$ decline through the Pliensbachian and rise through the Toarcian, with a minimum of around 0.707060 at the P-T boundary (182.7±0.7Ma). The turnaround has been attributed to increased weathering connected in some way with Karoo-Ferrar volcanic activity. Marine carbonates (an oceanic sink for Ca and Sr) fractionate Ca and stable Sr isotopes during precipitation, and small-scaled excursions in both isotope records have been associated with changes in continental weathering and ocean anoxia [2-3]. The combination of stable-Sr and Ca isotope systems may help shed light on the above hypothesis.

Both Ca and Sr isotope measurements are conducted on IsotopX Phoenix X-62 TIMS at Royal Holloway University of London. We will present stable Sr and Ca data from well-preserved belemnites spanning the Pliensbachian – Toarcian boundary.

[1] Farkaš et al., *GCA*, 2007a, 71(21), 5117-5134.
[2] Farkaš et al., *EPSL*, 2007b, 253(1), 96-111.
[3] Blättler et al., *EPSL*, 2011, *309*(1), 77-88.
[4] Vollstaedt et al., *GCA*, 2013, 128, 249-265.
[5] Suan et al., *EPSL*, 2010, 290(3), 448-458.