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Reconstructing intermediate depths temperatures using strontium isotope data on *Lophelia pertusa* (L.) - first results

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We use cold-water coral *Lophelia pertusa* from water depths between 100 and 1000 m from four different locations along the European continental margin (Norwegian shelf, Skagerrak, Porcupine Seabight/Rockall Bank, and Gulf of Cadiz). With growth rate of 0.5 to 2.5 cm per year (Freiwald 2002) this species provides a climate archive of a few decades. However, sampling is a challenge as *Lophelia* shows a complex microstructure (Rollion-Bard et al. 2003). Samples were drilled in two different ways: (1) vertically along the growth direction of the polyps, and (2) horizontally across the different growth phases at the calyx.

Geochemical analyses concentrate on the determination of stable oxygen and carbon isotopes (δ^{18}O, δ^{13}C) as some studies already exist using these proxies to reconstruct temperatures. However, reconstructing temperatures using these two stable isotopes is insufficient and imprecise. Therefore, we also use Strontium-Calcium ratios (Sr/Ca), as well as the fractionation of Ca-isotopes (δ^{44}Ca) and Sr-isotopes (δ^{88}Sr) to support the reconstruction of temperature. Main focus will be the analysis and further development of this new geochemical and paleoceanographic proxy δ^{88}Sr (Eisenhauer et al. 2003).

Here, we present first results from *Lophelia pertusa*, sampled along the Celtic margin (Porcupine Seabight and Rockall Bank margin). These measurements are used to calibrate the isotope signatures of living *Lophelia* corals with recent bottom water characteristics (temperature, salinity, pH-value, dissolved oxygen, δ^{88}Sr, δ^{18}O and δ^{13}DIC of bottom water), and to establish *Lophelia pertusa* as a new high-resolution climate archive for intermediate water depths.

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