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## Identification and impact of early diagenesis on U-Th systematics of coral and *Tridacna* spp. carbonate archives

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Coral carbonates represent important paleo-proxy archives as environmental conditions are recorded geochemically during carbonate genesis. Combined with U/Th age dating climatic variability spanning geological time scales can be determined. The accuracy of the U-Th proxy approach is largely dependent on the degree of diagenesis experienced, as corals have to be considered as open systems with regard to uranium and thorium.

General improvements are reached by combining micro-CT pre-investigation with micro-sampling techniques in order to identify and subsample pristine remains of the primary coral skeleton.

This approach is supported by electron micro probe, scanning electron microscopy and epi-fluorescence microscopy to identify skeletal parts characterized by secondary mineral precipitation and organic components, indicating mineral alteration by the activity of endolithic organisms. Applied on recent to subrecent coral micro atolls and fossil *Tridacna* spp. from Zanzibar (Tanzania), this study reveals small-scale heterogeneities in U-Th systematics of different time scales.

Besides the aspect of long-term diagenesis and secondary mineralization this study investigates the impact of biologically-driven geochemical carbonate alteration during and shortly after corals live span.