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Dating of impure carbonates – Utilizing laser ablation MC-ICPMS to reconstruct initial $^{230}\text{Th}/^{232}\text{Th}$ ratios

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Uranium series dating is a valuable and well-established tool for age determination of carbonates in paleoclimatology. However, detrital contamination can alter results. A correctional term is commonly used to account for additional Th introduced into the sample material as detritus. This correction requires to make assumptions about the initial $^{230}\text{Th}/^{232}\text{Th}$ ratio of the detrital material, since it is not possible to extract it from an individual measurement. Laser ablation multi collector ICPMS equipped with multiple ion counting detectors offers the possibility to use an isochrone technique to extract the initial $^{230}\text{Th}/^{232}\text{Th}$ value from heterogeneous samples with a high detrital content. This decreases systematic errors and uncertainties introduced by the detrital correction term and therefore improves the possibility of dating impure carbonates.