Examples: Imagery-correlated high precision stable isotope analysis
Speleothem calcite

Laser confocal microscope image enhances annual growth bands

10 µm pits for oxygen isotope ratio

growth direction

Orland et al. 2009
Correlated: CL, $\delta^7$Li & U-Pb age in zircon

$4113 \text{ Ma}$
$4064 \text{ Ma}$

$\delta^7$Li correlates with CL domain

Ushikubo et al. 2008
Example: zoning of oxygen isotope ratios in quartz overgrowths

\[ \delta^{18}O \ (Qt) \ \%_{\text{VSMOW}} \]

Distance from detrital grain (\(\mu\text{m}\))

- 15 micron spots
- 3 micron spots

Pollington et al. 2011
Fish otoliths

BLG-012

10 keV Cs⁺ (~10 μm spots)

Bluegill

Bluegill

Weidel et al. 2007

Daily growth bands

δ¹³C

δ¹⁸O

13C labeling of lake

Weidel et al. 2007