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New software for rapid, semi-automated analysis of laminated climate archives - The WinGeol Lamination Tool

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Geological and biological archives showing an annually laminated internal structure are currently top priority in palaeoclimate research, as they are recognized as very high-resolution archives of environmental change. Also, the annual origin of laminations can be validated by absolute age dating or by using instrumental data for the most recent period. Microscopic laminae may span several hundreds to thousands of years and frequently reveal a high degree of internal growth variability. Quantitative examination of annual banding and laminations on the macroscopic and microscopic scale (including transmitted-light and epifluorescence microscopy) is thus a tedious task and may be partly automated. We developed software (WinGeol Lamination Tool) using C++/ capable of semi-automatically detecting and measuring individual lamina thicknesses in archives showing large internal growth variability. The Lamination Tool enables the operator to efficiently and quantitatively examine laminae down to the micron scale and it was successfully tested on a variety of annually banded samples, including lake sediments.