

Construction of a device for rapid cellulose extraction from wood for applications in isotope dendrochronology and organic biogeochemistry

Kevin J. Anchukaitis (kja@ldeo.columbia.edu)  
Tree-Ring Laboratory, Lamont-Doherty Earth Observatory

Stable isotopes offer a powerful approach to extracting high-resolution climate and ecological information from trees. They can serve as tracers of – or evidence for – various physiological, ecological, or climatological phenomena. The methodology for development of stable isotope records from tree rings involves first subsampling the wood from standard increment cores, then the extraction of the stable cellulosic component from the raw wood, and then the measurement of the isotope composition of the cellulose using continuous flow isotope ratio mass spectrometry. It is the extraction of the cellulose component from whole wood, however, that is considered the true rate limiting step in the process. Here, in collaboration with the staff of the Instrument Lab at Lamont-Doherty Earth Observatory, I propose to construct an apparatus for rapid chemical processing of organic samples for use in bulk stable isotopic studies. The intent is to provide a system that is flexible enough to use various chemical protocols and is available to any investigator in need of rapid sample preparation, separation, and extraction.