

# Lead isotope dating of marine sedimentary cores

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Laboratories from 14 countries (with different levels of experience in radiometric measurement of radionuclides in environmental samples and in the application of the  $^{210}\text{Pb}$  dating method) participated in an

interlaboratory comparison (ILC) exercise related to the application of the  $^{210}\text{Pb}$  sediment dating technique. The exercise was conducted in the framework of a research project coordinated by the IAEA.

The participating laboratories were given aliquots from various strata of a marine sedimentary [core](#) collected from a bay near Sao Paulo, Brazil, and were asked to provide the mass activities of various radionuclides in each core stratum and an age vs. depth assignment based on the radiometric results obtained, using the  $^{210}\text{Pb}$  dating model considered most appropriate by each [laboratory](#).

The results of this exercise show that the participating laboratories are highly skilled in the process of radiometric determinations, while, on the other hand, the dating results were not as successful, in part because the participating laboratories have widely varying experience with dating. The interlaboratory comparison [exercise](#) made it possible to evaluate the difficulties faced by laboratories using  $^{210}\text{Pb}$  dating, and also made it possible to observe certain limitations in providing reliable chronologies. The application of the  $^{210}\text{Pb}$  [sediment](#) dating method is far from a routine technique and requires expert knowledge and multidisciplinary experience.

The  $^{210}\text{Pb}$  sediment dating method is an excellent tool to establish recent chronologies of sedimentary cores. Its proper application is essential for a large number of environmental studies. However, this dating method cannot be used as a routine tool, as each core requires a different approach and sufficient information to support the proposed chronologies. A correct understanding of each  $^{210}\text{Pb}$  dating model used, its assumptions and limitations in each environment is essential to providing robust and useful chronologies.

**More information:** R. Garcia-Tenorio et al. From radiometry to chronology of a marine sediment core: A  $^{210}\text{Pb}$  dating interlaboratory

comparison exercise organized by the IAEA, *Marine Pollution Bulletin* (2020). [DOI: 10.1016/j.marpolbul.2020.111490](https://doi.org/10.1016/j.marpolbul.2020.111490)

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