

Parameter correlations in paleoclimatics – PIXE, PIGE and RBS

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Physics-based techniques have been well applied in lake sediment research, but the innovative use of new approaches has been limited. Basic measurements are commonly used, but attempting modern applications has been seen too risky and unfamiliar to experiment for most researchers.

This research focuses on physics-based approaches to be applied in paleoclimatics. By the means of modern approaches novel knowledge of climate change and lake anoxia can be attained. This study obtains parameter correlations between basic, commonly used and modern physics-based applications.

In addition to basic magnetic measurements and techniques, such as susceptibility, remanent magnetization and varve analysis, the application studied in this research is particle induced x-ray emission (PIXE), that is a non-destructive total element analysis method that is considered to be highest on its accuracy. Measurements were made as co-operation with accelerator laboratory at University of Jyväskylä. Furthermore, proton induced gamma-ray emission (PIGE) and Rutherford backscattering spectroscopy (RBS) that have only been used in modern physics will be attempted on varved lake sediments.

The correlation in parameters may suggest different accuracies in studied applications and therefore inaccuracy in parameter values.

References:

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