

Hyperspectral Imaging for sediment cores : a promising method for source-to-sink approach ?

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Hyperspectral imaging refers to the ability of an imaging device to measure the intensity of reflected light showing different wavelengths (from NIRS to UV-VIS) with high spectral resolution. Coupled with a core analysis bench, this device offers a rapid, non-destructive and cost-effective way to provide records of properties and composition at the micrometer-scale (40 mm) from sediment archives. With the exception of mines exploration, the use of Hyperspectral Imaging in Geosciences emerges as a innovative method to explore sediment archives for paleoclimatology / paleoenvironment purposes. By the use of two cameras (400-1000 nm; 1000-2500 nm) and from three sediments cores sampled in various sedimentary environments - lakes of Linné and Bresson (Arctic and Mediterranean area), and a paleo-lake of the Black Sea, we present new results / methodologies applied to the source-to-sink approach,. Our findings reveal that the hyperspectral imaging is proficient in i) the reconstruction of the origin of the sedimentary material along a sediment core, ii) the reconstruction of the quality of the sedimentary material along a core (e.g. sedimentary organic matter) iii) as a decision

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support to adapt the sampling strategy or to orientate the study of the considered core. The length of the sedimentary core but also the size of the watershed has obviously an implication on the proposed strategy.