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## X-ray ( $\mu$ )CT in turbidite research: state-of-the-art and future challenges

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### ABSTRACT

Even though X-ray ( $\mu$ )CT is becoming an increasingly widespread technique in many disciplines – among which sedimentology –, applications are still scarce in turbidite research. In the past few years we showed that medical X-ray CT scans of sediment cores can provide a wealth of information about turbidites and especially their internal structures. In Aysén fjord (Chile) as well as several Chilean and Alaskan lakes, we showed that sedimentary structures such as ripples can be used to reconstruct flow directions. When sedimentary structures are absent, fabrics (e.g. grain imbrication) can also be used. However, the resolution of medical X-ray CT scans is usually not sufficient to visualize single grains or clasts inside the sediment cores. Therefore, medical X-ray CT scans do not allow the determination of single grain orientations. Recently however, sediment cores from a Swiss and an Alaskan lake were scanned at the HECTOR (High Energy CT Optimized for Research) scanner of the UGCT (Masschaele *et al.*, 2013) to obtain  $\mu$ CT data. Processing of this data with the Octopus Analysis software package have proven valuable to detect and isolate single grains, and extract information on their exact orientation. Using UGCT-developed MATLAB® codes, it was possible to express the orientation of the grains using the – in geology widespread used - stereographic projection.

### REFERENCES

Masschaele, B., Dierick, M., Van Loo, D., Boone, M.N., Brabant, L., Pauwels, E., Cnudde, V., Van Hoorebeke, L., 2013: HECTOR: a 240kV micro-CT setup optimized for research. *Journal of Physics: Conference Series*. 463 (1), p. 012012.