

High resolution remanent magnetization scanner for long cores

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Superconducting rock magnetometer reaches saturation when measuring magnetic moments higher than $5 \cdot 10^{-5}$ Am². Due to the distance of the sensor from the measurement zone, the spatial resolution is low for continuous measurements led on U channel or cores. To solve these problems, we designed a core logger dedicated to the measurement of remanent magnetizations. Based on a fluxgate sensor located very close to the sample, the spatial resolution of the core logger is infra-centimetric. The fluxgate sensor is also able to detect magnetic fields of few nT produced by magnetic moments of the order of few 10^{-8} Am². As the equipment does not reach saturation, we measured isothermal remanent magnetization of highly magnetic samples. This magnetization was acquired perpendicularly to the long axis of U-channels from Cassis paleo-lake (Romey et al., 2015) and of cores from Haughton impact structure (Zylberman et al., submitted) using Halbach cylinders (Rochette et al., 2001). To interpret local magnetic fields in terms of magnetic moments, we performed an inter-calibration with the superconducting rock magnetometer and signal inversion. This development led to the filing of a patent (FR.16/53142) and is funded by the ECCOREV project MESENVIMAG.

References:

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