



The use of FORC diagrams in environmental magnetism: recent developments

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First-order reversal curve (FORC) diagrams have proven to be a valuable tool for characterizing magnetic minerals in geologic materials, especially when ambiguous mixtures of two or more magnetic components need to be resolved. Since their introduction to the paleomagnetic community and until very recently, FORC diagrams have been used in a qualitative manner for distinguishing magnetic contributions according to the domain state of the associated particles. However, the large amount of information provided by high-resolution FORC measurements enable fully quantitative analyses, and, at least in some cases, a precise numerical separation of magnetic components (e.g. authigenic vs. detrital/aeolic contributions). Although high-resolution FORC measurements are extremely time consuming and therefore not systematically applicable to large numbers of samples, the information provided by the analysis of few reference samples supports the calibration of much faster techniques, such as magnetic unmixing based on hysteresis loops. Quantitative analyses of FORC measurements are made possible by a dedicated software (VARIFORC, see poster EGU2015-ASC-2015-14199 in this session), as shown with examples based on the identification of magnetofossil signatures in pelagic carbonates.