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Paleomagnetic and AMS properties of a 100m long core drilled from Miocene lake sediments in the Turiec basin

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A 100 m long core was drilled from the Late Miocene deepwater lake sediments of the Turiec Basin for sedimentological, paleontological and magnetostratigraphic study. For the latter, 79 samples were selected, packed in folia and kept refrigerated till the laboratory measurements started. The samples were not oriented azimuthally, neither with respect to each other, except five pairs from a depth 36, 51, 69, 85, 97 m, which served to check the degree of consistency of the paleomagnetic signal. For the test several specimens were drilled from each of the 10 samples, NRM and AMS measured, and stepwise thermal demagnetization accompanied by susceptibility monitoring carried out till the NRM signal was lost. This invariably happened by 400 °C, while the susceptibility, after a considerable decrease started to increase dramatically at this temperature. All these features pointed to magnetic iron sulphide, probably greigite, as the carrier of the NRM. Both the paleomagnetic signal and the AMS fabrics revealed a high degree of consistency. Following the test experiments a large number of core segments were subjected to similar treatment. In some of them thin intercalation of silty and sandy material indicated the bedding dip in a range from 8° to 15° in the otherwise homogenous deepwater grey carbonatic clay. The dip direction and angle showed fairly good agreement with the magnetic foliation plane, thus the latter can be a proxy for the former, when silty intercalations are lacking. By reorienting the cores with respect to each other azimuthally (Fig.1.) and eventually to the dip direction observed nearby surface outcrops, we are hoping to define a paleomagnetic direction for the locality of the drill core.

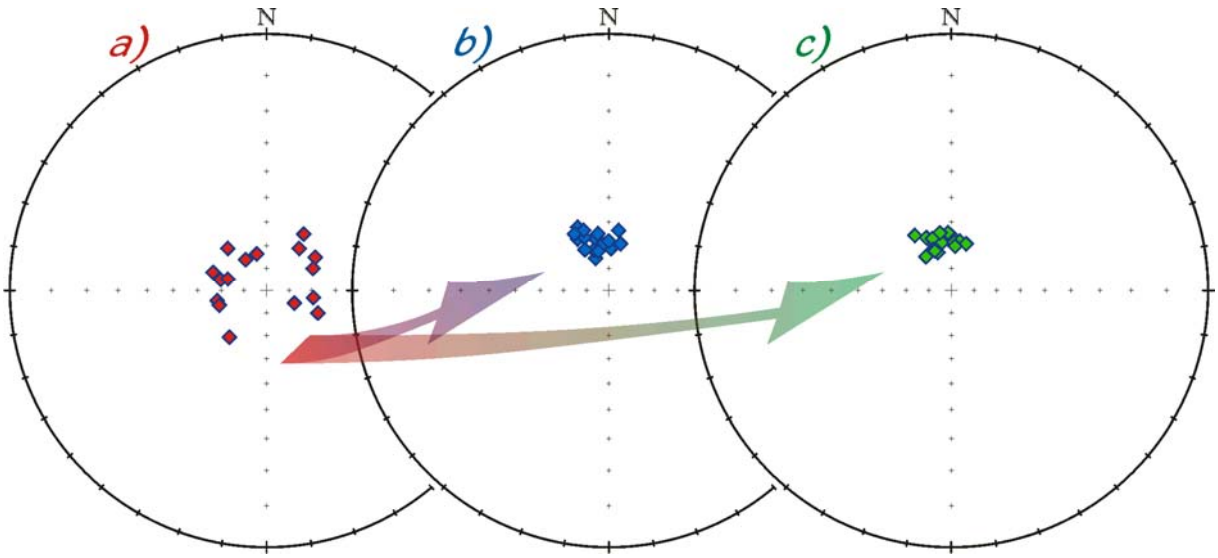

Figure 1: Preliminary reorientation of some core segments. Paleomagnetic mean directions of sixteen core segments on stereographic projection. 'In situ' mean directions (a). Mean directions after reorientation of the core segments, based on the dip measured on the proper core segments (b) and based on the dip calculated from the magnetic fabric of the proper core segments (c).

Concerning magnetic polarity, the majority of the so far studied cores have normal magnetization, with indication of two short reversals in the uppermost 20 m. As the study is not yet finished, the so far unexplored segments may modify the polarity pattern.

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