



## **Palaeomagnetic results from the Palaeozoic of Istanbul: A hypothesis for Remagnetization**

Nalan Lom (1), Mathew Domeier (2), Semih Can Ülgen (1), Turgay İşseven (3), Ali Mehmet Celal Şengör (1,4)  
(1) Istanbul Technical University, Eurasia Institute of Earth Sciences, 34469, Maslak-Istanbul, Turkey (lom@itu.edu.tr), (2) Department of Geosciences, CEED, University of Oslo, 1028 Blindern 0316 Oslo, Norway, (3) Istanbul Technical University, The Department of Geophysical Engineering, Istanbul, Turkey, (4) Istanbul Technical University, The Department of Geological Engineering, Istanbul, Turkey

The Istanbul Zone in northwestern Turkey is a part of a larger continental fragment called the Rhodope-Pontide Fragment. The Istanbul Zone differs from its surroundings by its continuous, well-developed sedimentary sequence extending from the early-medial Ordovician to the early Carboniferous.

The İstanbul Zone has a complicated deformation history related to the Hercynide (or Scythide), Cimmeride and Alpidic orogenies. Although the region of Istanbul shows essentially no metamorphism and only a weak cleavage development, constraining the entire history of the deformation in the İstanbul Zone marginal fold and thrust belt is a difficult task, primarily due to the multiple deformation phases. But yet it is not impossible. The Palaeozoic sequence is cut by late Cretaceous plutonics together with dacitic and andesitic dykes. This arc magmatism is ascribed to the north-dipping subduction of the Neo-Tethyan ocean along the İzmir-Ankara-Erzincan suture. The Palaeozoic sequence is unconformably overlain by Permian and younger sedimentary strata.

In this study a total of 523 samples were obtained from 48 sites around İstanbul and Kocaeli. 465 samples collected from Palaeozoic sedimentary rocks and 58 samples belong to the dykes that cut these sediments. Specimens were demagnetized in the laboratory by using both AF and thermal treatments depending on their effectiveness. After demagnetization treatments, 290 specimens showed stable demagnetization patterns and majority of these samples have a characteristic remanent magnetization component close to the present day geomagnetic field. Demagnetization studies demonstrate variable degrees of overprinting in a large number of samples. After the application of the tilt correction, %70 of the specimens failed the fold test at site level (early Ordovician siltstones; late Silurian-early Devonian limestones; late Devonian limestones; early Carboniferous turbidites). Rest of them clearly got scattered with increasing  $\alpha_{95}$  and decreasing k values (mid Ordovician conglomerates; mid-late Devonian shales; late Ordovician-early Silurian sandstone and siltstones). This secondary magnetization, acquired during or after the folding event, constitutes evidence of pervasive remagnetization that can be caused by regional re-heating related to the Cretaceous arc magmatism. This suggestion contradicts the previous palaeomagnetic studies and requires further and detailed investigation on Palaeozoic sequence.