Geophysical Research Abstracts, Vol. 8, 09969, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09969

Cooling rate effect as a major cause of within-site scatter for Single Spot-Reading Cooling Units

J. Morales and A. Gogichaishvili

Laboratorio de Paleomagnetismo y Geofisica Nuclear, Instituto de Geofisica, UNAM,

Cooling rate effects on the acquisition of thermoremanent magnetization (TRM) was considered long time ago in the initial studies of rock magnetism and has been documented for archaeomagnetic materials, where cooling in laboratory conditions is generally much faster compared to natural cooling rates. This later condition also applies to volcanic rocks, however, cooling rate correction on volcanic rocks is not a common practice and only few studies take this dependence into account. Moreover, many studies have been devoted to understand the significant variation of absolute Thellier-paleointensity often observed within a single lava flow. Attempts to find possible correlation between these variations and some physical/magnetic parameters have been unsatisfactory. Explanations proposed are mainly based on distinct oxidation states of opaque minerals throughout the profile or on the chemical alteration of the sample during the heating. Systematic scatter and overestimating of PI values obtained in a single lava flow are significatively reduced when using cooling rate correction to raw selected data. Moreover, precision of individual determinations is substantially increased. Cooling rate effect upon acquisition of TRM in volcanic rocks seems to be as critical as in archaeomagnetic investigations.