2006 Joint Assembly
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Your query was: **kletetschka**

HR: 16:45h
AN: **GP24A-03**
TI: TRM in Low Magnetic Fields: a minimum field that can be recorded by large multidomain grains

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AB: Thermally acquired remanent magnetization is important for the estimation of the past magnetic field present at the time of cooling. Rocks that cool slowly commonly contain magnetic grains of millimeter scale. This study investigated 1mm-sized magnetic minerals of iron, iron-nickel, magnetite, and hematite and concluded that the thermoremanent magnetization (TRM) acquired by these grains did not accurately record the ambient magnetic field less than 1 microTesla. Instead the TRM of these grains fluctuated around a constant value. Consequently, the magnetic grain ability to record the ambient field accurately is reduced. Above the critical field, TRM acquisition is governed by an empirical law and is proportional to saturation magnetization (Ms). The efficiency of TRM is inversely proportional to the mineral's saturation magnetization Ms and is related to the number of domains in the magnetic grains. The absolute field for which we have an onset of TRM sensitivity is inversely proportional to the size of the magnetic grain. These results have implications for previous reports of random directions in meteorites during alternating field demagnetization, or thermal demagnetization of TRM. Extraterrestrial magnetic fields in our solar system are weaker than the geomagnetic field by several orders of magnitude. Extraterrestrial rocks commonly contain large iron-based magnetic minerals as a common part of their composition, and therefore ignoring this behavior of multidomain grains can result in erroneous paleofield estimates.

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SC: Geomagnetism and Paleomagnetism [GP]
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