TRM in low magnetic fields: a minimum field that can be recorded by large multidomain grains

1

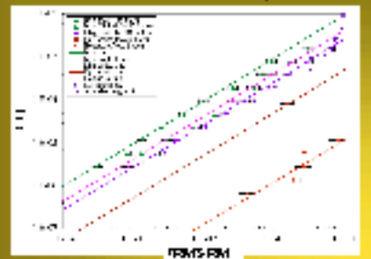
TRM theory (SD grains)

$$B = \frac{B_c(T_b)}{50}\frac{M_s(T)}{J_s(T)} \qquad B_c(T_b) = 0.21\mu_0 J_s(T_b)$$

$$B = 0.0042\mu_0 J_s(T_b)\frac{M_s(T)}{J_s(T)}$$

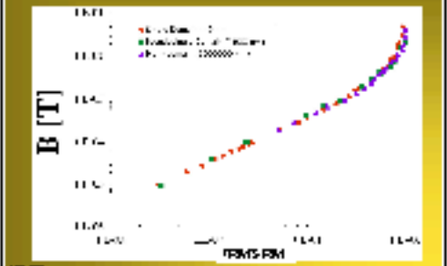
2

Composition dependent TRM acquisition



3

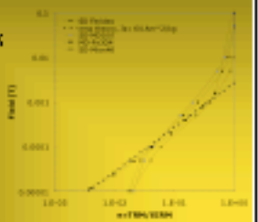
Grain size independence



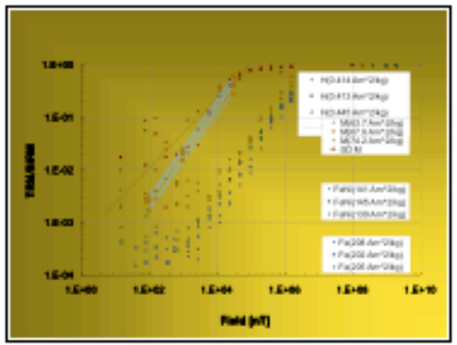
4

TRM acquisition of SP (spherical nanoparticle size magnetite (magnetite ?)

- SP magnetite becomes SD at 80K
- TRM acquired follows the empirical law
- Deviation below 40K is due to poor shielding

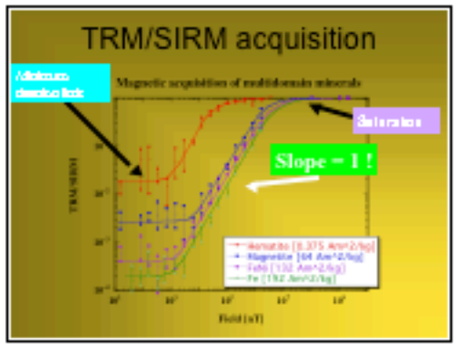


5



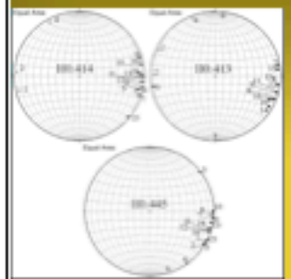
6

TRM/SIRM acquisition



7

TRM acquisition directions (hematite)



8

Conclusions

- There is a finite plateau (magnetization level) starting at 1 microtesla below which the acquired TRM is unreliable
- This threshold may be consequence of the number of domains within the mineral volume
- Similar threshold seems to be observed in meteorites

9