



Meaning of remanence analysis in AMS studies of sedimentary rocks. Central-Southern Pyrenees (Aragón, Spain)

Ó. Pueyo Anchuela, A. Gil Imaz, A. Pocovi Juan, A. Arauzo, E. Guerrero, and C. Rillo
Universidad de Zaragoza. Zaragoza. Spain (opueyo@unizar.es)

Anisotropy of Magnetic Susceptibility (AMS) represents a magnetic fabric technique that is widespread applied in different settings and with different purposes. The knowledge of the ferromagnetic sources to the susceptibility is clearly understood as an essential requirement to the real understanding of the AMS meaning. The analysis of the different ferromagnetic mineral phases have been developed parallel to the paleomagnetism techniques with a very important number of applications even when they are related with changes in the remanence and not in the susceptibility. The susceptibility mineralogical techniques have started its development recently, with different systems that measure susceptibility in different conditions (field and temperature) where the change in the susceptibility related with different mineralogical sources can be quantified or, at least, rated in the same property measured during the AMS routine.

In this work, results from different paleomagnetic mineralogical techniques are compared along different lithological groups from the Southern Pyrenees and the meaning of the ferromagnetic phases to the susceptibility. The studied samples came from different cross-section from the western Southern-Central-Pyrenees. The studied lithologies range from Permian to Miocene in age and from the inner to the outer zones of the Pyrenean chain. The remanence analysis: pARM, S-ARM, sIRM and its modelization, thermal demagnetization of IRM of three axes and AF demagnetization of the NRM show very similar results in the bearing remanence particles. The main differences in the mineralogical sources came from early diagenetic processes and weathering, while the original magnetic particles are similar possible linked to the same sedimentary sources, similar diagenetic processes and the absence of metamorphism.

On the other hand, these results are compared with the meaning of the ferromagnetic particles to the susceptibility by the measurement of curves of susceptibility change with the temperature (ranging from 77 to 973 K), the measurement of the susceptibility at low and high field (0 to 2.5 T) and the measurement of the susceptibility at different frequencies.

The results show that while the ferromagnetic particles are similar along the whole chain and within the lithological group, the meaning of them in the magnetic susceptibility show a huge variability in the chain, the lithological group and even at outcrop scale.

These results indicate that the approach to the mineralogical sources to the susceptibility cannot be lonely abroad from a general point of view of the remanence analysis (that show nearly the same mineralogical phases at chain scale), while their contribution to the susceptibility and the AMS can show important changes even at outcrop scale.