

## *Magnetic analyses on Oligocene tonalites along the Giudicarie fault system*

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Numerous larger and smaller magmatic bodies are known along the Periadriatic line (PAL) and are spatially and temporally associated with the activity of the fault system. Magmas were channelled from the base of the thickened continental crust (at a depth of 40-50 km) into the narrow mylonitic belt of the PAL (Rosenberg 2004).

To provide more information concerning the activity of the bended central part of the PAL, formed by the Giudicarie fault system (GFS), tonalitic lenses along the GFS and the Adamello Pluton have been sampled. Both the anisotropy of magnetic susceptibility (AMS) and the remanence were measured.

Between Maulls in the north and Meran in the south the magnetic foliation resulted to be parallel to the GFS. The magnetic fabric is oblate but often a horizontal magnetic lineation is defined. In overlying Austroalpine mylonites with a nearly identical fabric orientation a dextral sense of shear could be observed overprinted by a down dip stretching lineation. This argues for a ductile deformation of the tonalites along a dextral strike-slip fault. Further to the south between Meran and the conjunction of Tonale Line and GFS the tonalitic lenses provide also a mostly oblate fabric, but the magnetic foliation is not longer parallel to the adjacent fault. Additionally all these sites yielded different magmatic foliation and lineation. This indicates that the lenses have been boudinaged and rotated during the brittle deformation along this part of the GFS. On the easternmost end of the Tonale line the magnetic foliation within the Adamello Pluton is again oriented parallel to the adjacent fault, which bends from the general W-E in a SW-NE orientation and terminates in a NNE-SSW trending brittle segment of the GFS. The NW dipping oblate fabric provided by the AMS data is in perfect agreement with the general foliation of the Adamello Pluton in this area.

Curie temperature analyses indicate that the magnetisation is carried mostly by magnetite yet the intensity curves during stepwise thermal demagnetisation show a rapid decrease at low temperatures (200-350°C depending from the site), untypical for magnetite. According to these observations the magnetic information can probably be interpreted as viscous or partial thermoremanent magnetisation. This implies very slow initial cooling of the magmatic body down to the blocking temperature, followed by faster cooling. The mean vectors calculated for the single sites form a NW oriented group (Mean 333/54;  $\alpha_{95}$  14.2°). These counter-clockwise rotated declinations are in agreement with Late Oligocene to Middle Miocene data from the whole Southern and Eastern Alps and the internal massifs of the Western Alps reported in several other studies (see Thöny et al. 2006 for a compilation).

### References:

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