



AMS SIGNIFICANCE OF DYKES AND GRANITE FROM A SAME PLUTON – AN EXAMPLE FROM THE FRENCH MASSIF CENTRAL

J.-Y. Talbot, Y. Chen, M. Faure

Institut des Sciences de la Terre d'Orléans, Université d'Orléans, France
(Jean-Yves.Talbot@univ-orleans.fr)

The relationships between plutons and dykes of granite have been the topic of many studies since the hypothesis of "dyke propagation" was proposed as the main mode of ascent and emplacement of granitic plutons. However, most of observed pluton-related dykes can not be interpreted as "feeder dykes" but are fed by the magma chamber. Nevertheless, few AMS studies were carried out in both a pluton and its associated dykes to evaluate their internal fabrics. In the Cévennes area (SE of the French Massif Central), the Aigoual – Saint-Guiral – Liron granitic pluton consists of two cogenetic granitic facies. The main body is a porphyritic granodiorite facies which is common in the plutons of the Cévennes area. In the northern part of the pluton, a dyke swarm develops in the continuation of the porphyritic facies. Those NE-SW-trending dykes are composed of microgranite with locally porphyritic texture. This pluton intrudes metamorphic units dated at ca. 340–330 Ma and related to a N-S-trending shortening event. The emplacement of the pluton dated at ca. 310 Ma occurred during the late-orogenic extension of the Hercynian belt. This extension is characterized by an E-W to NW-SE-trending stretching. An AMS study was carried out on the two granitic facies of this pluton. As shown by surveys of magnetic mineralogy, such as thermomagnetism, hysteresis loops, bulk magnetic susceptibility measurements, microscopic observations, the paramagnetic minerals, that is biotite with amphibole in traces, are the main carriers of the AMS for the two facies. Microstructures indicate the lack of significant solid-state deformation in both facies suggesting that AMS fabric is of magmatic origin and that no deformation is recorded after the complete crystallisation of the magma. In the porphyritic facies, the AMS fabric pattern is characterized by an E-W to NW-SE-trending lineation with shallow or moderate plunges mainly east-

ward. In general, magnetic foliations dip moderately eastward. This pattern is consistent with the regional extensional tectonics indicating that porphyritic granite recorded this regional event. On the contrary, in microgranitic dykes, the AMS pattern shows a NE-SW to NNE-SSW-trending lineation with shallow plunges and westward dipping foliations. Thus, lineations are parallel to the trend of the dykes. This AMS fabric is considered to be representative of the magma flow in dykes and did not record the regional deformation. Therefore, the two cogenetic granitic facies display two distinct AMS fabrics. The first one, in the main body, is linked to a regional deformation while the other, in dykes, is related to the magmatic dynamics, that is the magma flow. It is likely that microgranitic dykes were fed from the main pluton.