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## Magnetic Fabrics and Paleomagnetism on Mesozoic Dike Swarms from São Sebastião and Ubatuba Regions, NE São Paulo State, SE Brazil

Maria I. B. RAPOSO

*Universidade de São Paulo, Instituto de Geociências, São Paulo 05508-080, Brazil*

The Mesozoic magmatism in Southern Brazil is represented mainly by the basaltic flows of the Serra Geral Formation, the tholeiitic dikes swarms from the Ponta Grossa Arch, Florianópolis, and along the coast between São Paulo and Rio de Janeiro, and several alkaline complexes that lie along tectonic features associated with the evolution of the Paraná Basin. The emplacement of the dike swarms and the alkaline complexes is related to the processes of the break-up of the Gondwanaland and opening of Atlantic Ocean.

We performed an intensive magnetic study (magnetic fabrics, paleomagnetism and rock-magnetism) in all dike swarms from the coastline of São Paulo state, in which the dikes with different chemical composition (tholeiitic, lamprophyre and alkaline) are widespread along the Serra do Mar between São Paulo and Rio de Janeiro. The principal purpose of this study is to apply magnetic fabric techniques to investigate the magma flow, to provide information on its mode of emplacement, and to investigate the relative position of magma sources and fractures, and to determine the paleomagnetic pole(s) of the dike swarms to compare it with available poles from Ponta Grossa and Florianópolis to verify whether they can be the same age since it is believed that the tholeiitic activity occurred during the Early Cretaceous and was then partly coeval with Ponta Grossa and Florianópolis dikes; the other dikes are, however, younger than the diabases. To have a good control of the magnetic carriers we also performed an extensive rock magnetism study. In this paper we show results of the dikes from the São Sebastião and Ubatuba regions.

We have studied 86 dikes (diabase and lamprophyres) that outcrop on the beaches of São Sebastião and Ubatuba

(NE of São Paulo). The dykes intrude metamorphic rocks; have thicknesses ranging from a few centimeters to 2 m for lamprophyres and up to > 10 m to the diabase. They trend predominant N40°-50°E with vertical dip. The magnetic fabrics were determined through both anisotropy of magnetic susceptibility (AMS) and anisotropy of anhysteretic remanent magnetization (AARM). The magnetic properties obtained through various experiments indicate that the magnetic mineral responsible for anisotropy and remanence is magnetite with pseudo-single domain grains. The dominant AMS fabric for the two swarms is the one expected to dikes and corresponds to magmatic flow. The analysis of  $K_{\max}$  inclination allowed to infer that the dikes were fed by horizontal flows ( $K_{\max} < 30^\circ$ ) and inclined ( $K_{\max} > 30^\circ$ ) up to vertical suggesting some movement of the South America plate or more than one magma source for diabases and lamprophyres as well. However, the AARM for the majority of the dikes is not coaxial mainly respect to magnetic lineation indicating that magnetites were able to register a posterior tectonic event indicating that AARM is younger than ASMS. The paleomagnetic data indicate two intrusive events for both diabase and lamprophyres as evidenced by the normal and reverse polarity of the geomagnetic field. These data also indicate that sources, geochemically different, were active simultaneously, and that tholeiitic and lamprophyre dikes are the same age.

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\* Corresponding author. E-mail: irene@usp.br