

ANISOTROPY OF MAGNETIC SUSCEPTIBILITY CONSTRAINTS ON FLOW FABRIC OF THE PARANÁ MAGMATIC PROVINCE

Tamrat,E and Ernesto,MIAG-USP, Rua do Matao 1226, 05508-900, Sao Paulo, SP, Brasil

In order to infer paleoflow direction and to locate possible point sources of magma feeders we have performed a combined AMS and rock magnetic study on several lava flows of the Parana Magmatic Province (PMP) collected from six different sequences. Because magmatic flow can align suspended magnetically susceptible minerals, it can create measurable anisotropy in magnetic susceptibility even in rocks with no visible fabric. In the studied sequences the low field AMS evidenced three different and well defined fabric orientation along the PMP, indicative of the magma flow direction. One sequence from the southern part of the province, JS (27 flows), shows maximum AMS ellipsoid (k_1) trending approximately NW-SE. Two sequences of the west-central part of the province, IC (13 flows); and PA (17 flows), trends E-W direction. Three sequences of the south-eastern part of the province, CV (24 flows), BV (20 flows) and TS (31 flows) shows k_1 ellipsoid trends to NE-SW. In each case the minimum axes of the ellipsoid (k_3) is tightly grouped sub-vertically to the bedding with relatively weak degree of anisotropy, indicative of the primary origin of the magnetic fabric. Rock-magnetic parameters, such as isothermal remanent magnetization (IRM), high field hysteresis loops and thermomagnetic curves suggests that the dominant magnetic mineral is a pseudo-single to small multi-domain grain size of magnetite. These observation attests that flows emanating from different sources may align their maximum susceptibility directions parallel to drainage that channel the flow or they will inherit the direction of the preflow topography structure.