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Magnetic fabrics and rock magnetism of Archaean and Proterozoic dike swarms in the southern São Francisco Craton, Brazil.

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Magnetic fabric and rock magnetism studies were performed on three mafic dike swarms (total of 38 dikes) from the southern most part of the São Francisco Craton (SFC) (Minas Gerais State, SE Brazil). They cut archaean granite-gneisse-migmatite and paleoprototerozoic terrains. These swarms are classified as basic-noritic (Sm-Nd age$\sim$2.65Ga), basic (Rb-Sr age$\sim$1.87Ga) and metamorphic (Rb-Sr age$\sim$1.87 Ga) suites, in which the second is the most important. Magnetic fabrics were determined by applying both anisotropy of low-field magnetic susceptibility (AMS) and anisotropy of anhysteretic remanent magnetization (AARM). In most sites AMS is dominantly carried by ferromagnetic minerals, however, in some sites the paramagnetic contribution exceeds 70% of bulk susceptibility. Mainly coarse to fine-grained Ti-poor titanomagnetites up to pure magnetite carry the magnetic fabrics.

Three primary AMS fabrics are recognized which all are coaxial with the AARM fabric. *Normal* AMS fabric is dominant in the basic suite (16 in 20 analyzed dikes) and occurs in 4 and 3 dikes from basic-noritic and metamorphic suites, respectively. This fabric is interpreted as magma flow in which the analysis of K_{max} inclination permitted to infer that the majority of dikes were fed by inclined flows ($30^{\circ}<K_{max}<60^{\circ}$), although 50% of dikes from the basic suite were fed by horizontal or sub-horizontal flows ($K_{max}<30^{\circ}$). *Intermediate* AMS fabric was found in 50% of dikes from basic-noritic and metamorphic suites, but in only 2 dikes from basic suite. It is interpreted as due to vertical compaction of a static magma column with the minimum stress along

the dike strike. *Inverse* AMS fabric is a minority (2 dikes from each suite). The parallelism between AMS and AARM tensors for dikes with abnormal fabrics suggest a primary origin for them. Gyroremanent magnetization (GRM) effect was negligible for the majority of dikes, but it was found in two dikes from basic suite with *normal* AMS fabric.

Magnetic fabrics recognized for the three studied swarms do not depend on neither magnetic mineralogy, nor geochemical composition, nor dike strikes, nor the age of the swarms since the same magnetic minerals and magnetic fabric types are found in dikes from all suites. Inclined and horizontal flows allow us to infer that most dikes were close and a few of them were far from their respective magma source.