MAGNETIC FABRIC, PETROFABRIC AND STRUCTURAL GEOLOGY OF THE CARLOS CHAGAS ANATEXITE, ARAÇUAÍ BELT (EASTERN BRAZIL)

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Geophysical and geological investigations (seismic and magnetotelluric profiles) suggest that the middle to lower crust is not completely in the solidstate and that considerable volumes of plutonic bodies are emplaced within these partially molten rocks (Nelson 1996). Tibetan and the Andean plateaus are the most striking examples. The Araçuaí belt, formed during the amalgamation of West Gondwana by the collision of the Sao Francisco and Congo cratons, represents a Neoproterozoic orogenic sector that shares similarities with a sub-crustal asthenosphere. Thermochronological data indicate that this sector remained hot for dozens of millions years (580-530 Ma). It is a domain over 300 km in length and c. a. 100 km in width where a huge plutonic-migmatitic complex crops out comprising tonalites, granodiorites, granites and charnockites emplaced within the Carlos Chagasanatexite. This complex is interpreted as a partial to almost complete melting product of the middle crust. Along all its extension, the complex isthrust to west over the metasediments of the São Francisco Craton. A high temperature-low pressure metamorphism occurs associated with deformation and partial melting (Oliveira *et alii* 2000). Experimental studies point out that small amount of melt volumes (7%), the rock strength drops drastically (Rosenberg, Medvedev & Handy 2005). The Carlos Chagas unit is exposed in the vicinity of Ecoporanga and Barra do São Franciso towns, in the Espirito Santo state. This unit is composed by a peraluminous anatexite with abundant sillimanite, feldspar, garnet, cordierite and biotite.

U-Pb data indicate that its crystallization occurred c.a. 574 ± 3 Ma. The main feature of this pluton is the presence of a pervasive magmatic foliation.This fabric is marked by the preferential alignment of mafic and felsic minerals, especially biotite, alkali feldspars and plagioclase. In grain scale, quartz shows interstitial growth and few solid state fabrics are observed. Magnetic foliations and lineations obtained with the anisotropy of magnetic susceptibility technique (AMS) suggest two main geometrical-kinematic patterns. The northern portion shows shallow lineation plunges (02° – 20°) to SE (140°-120°) or NW (340°-300°), while the foliation strikes NW-SE with shallow dips (03°-10°) some subvertical dips (70°) are due to some shear zones that trend NE and SW. The southern region shows complex magnetic fabric patterns. Magnetic lineation plunges range from 05° to 58°, in all directions, while the foliation strikes from NW-SE to NE-SW with low to high dips, lacking a statistical preferred orientation. This orientation dispersion in foliations and lineations is probably related to the intrusion of granites and charnockites of a late magmatic event (540-480 Ma). In hot lithospheres such as the orogenic sector studied here, strain localization is not efficient and rocks are deformed homogeneously. Preliminary data from field and AMS studies indicate that in the anatectic sector of the Araçuaí belt, as well as in adjacent segments, E-W compression resulted in a complex deformation pattern with little or no strain localization, involving huge volumes of rocks deformed homogeneously in the magmatic state.