

MICROSTRUCTURES AND QUARTZ C-AXIS FABRICS OF MYLONITES FROM THE PUTUNÃ SHEAR ZONE, SOUTHEASTERN BRAZIL

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Resumo: The Putunã Shear Zone is an unknown major orogen-parallel transcurrent structure outcropping in the Lauráceas Park, Paraná State, Southeastern Brazil. This shear zone shows kilometeric scale and NE direction, parallel to the Lancinha Fault, one of the most important Neoproterozoic structures occurring in the Southeastern Brazil. Mylonites formed along the Putunã Shear Zone comprise deformed amphibolite facies garnet-mica schists locally with staurolite, quartzites, and biotite-muscovite leucogranites. These mylonites display a subvertical NE-trending foliation and a subhorizontal stretching lineation. Well developed SC fabrics and several types of kinematic criteria (sigma and delta-type porphyroclasts with strain shadows and mantled porphyroclasts, micafish, isolated objects, sigma objects, oblique fabrics, and asymmetric boudins) systematically indicate sinistral movement. Quartz aggregates display variable microstructures indicating that different dislocation creep mechanisms operated during dynamic recrystallization. Some aggregates are formed by relatively coarse-grained and equant quartz crystals with lobate and very irregular shaped grain boundaries indicative of high-temperature grain boundary migration recrystallization. Other aggregates show strongly elongated porphyroclasts of quartz mantled by very fine-grained quartz crystals (few micrometers of size), with subgrains of the same dimension preferentially developed along the rims or internal deformation bands parallel to the mylonitic foliation. These microstructures combined with the grain size and proportions of the newly formed grains suggest combination of bulging and subgrain rotation recrystallization mechanisms. Deformed leucogranites along the shear zone vary from protomylonites to ultramylonites as a result of variable strain ratio. Feldspars in the ultramylonites were almost completely replaced by sericite and epidote, although rounded porphyroclast relics are also present. Strong crystallographic preferred orientations were developed in quartz aggregates of deformed leucogranites. The majority c-axis fabrics display consistent sinistral asymmetries concordant to others mesoscopic and microscopic shear sense indicators, although some symmetrical fabrics occur. Two main types of fabrics were observed: single girdles with Y and Z-maxima, and point maxima distributions with concentrations along the Y-axis and intermediate between Z and X-axis of finite strain ellipsoid. Both fabrics resulted from combinations of basal $\langle a \rangle$, rhomb $\langle a \rangle$ and prism $\langle a \rangle$ quartz slip systems.

Palavras-chave: microstructures; c-axis fabrics; dynamic recrystallization.