FLAME PERTHITES AND ALBITE-SPHENE SYMPLECTITES: EVIDENCE FOR COAXIAL DEFORMATION IN THE ESTRELA GRANITE COMPLEX, CARAJÁS REGION, BRAZIL

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The Estrela Granite Complex is a Late-Archean A-type syntectonic granite that outcrops to the east of the Carajás Range. During its crystallization, three successive surfaces developed: an igneous layering (S0) parallel to the contact of plutons (stage of ballooning); an axial planar subvertical schistosity (S1) (N-S shortening); and high-T mylonite zones (S1m). Strain analysis shows that the two latter surfaces developed in response to flattening stress. Two microtextures are observed in deformed monzogranites.K-feldspar porphyroclasts exhibit microperthites overprinted by flame perthites. Microperthites are homogeneously distributed within K-feldspar, whereas flame perthites occur as tension gashes perpendicular to S1, or as conjugate en-echelon sets oblique to S1. Pryer and Robin (1996) have shown that the orientation of flame perthites is a palaeostress-direction indicator.Hornblendes at the contact with feldspars are partly replaced by albite-sphene symplectites, which appear in strongly strained rocks. Symplectites are parallel to S1 and, as hornblende have their c-axis oriented close to the schistosity, they developed parallel to the prismatic faces of hornblende. The sphene lamellae, hosted in an albite matrix, are perpendicular or strongly oblique to S1, similarly to myrmekites observed by Simpson and Winsch (1989).The growth and orientation of flame perthites and sphene lamellae were controlled by subsolidus coaxial deformation and reflect cooling under increased oxidation conditions. Both microstructures may be employed as kinematic criteria.