

The Sub-fabrics of the Shear Zone Granite, Ponte de Lima, NW Portugal

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The Vigo-Régua Shear Zone is a major structure in the parautochthon of the Centro-Ibérica Zone, NW of Portugal, whose activity is known since the early Hercynian ductile deformation.

The Shear Zone Granite forms an outcrop with two main bodies, with a very elongate form. The mesoscopic fabric of the northern-body is characterized by a superimposed linear fabric.

In the Shear Zone Granite, adjacent to the western footwall in the narrowest zone, the minerals exhibit distinctive deformation features. The feldspar grains are fractured slightly show undulose extinction. The quartz exhibits a statistically uniform sub-fabric and presents a grain size variation from 0,4mm to 2,9mm. Biotite and muscovite define unimodal symmetric distributions. At the centre of the largest transversal zone, the granite has the same kind of feldspar grains. The quartz presents a grain size variation from 0,27mm to 2,3mm and a smooth fabric, with a preferential c-axis orientation in a girdle around the Z-axis of the deformation ellipsoid. The biotite defines a unimodal sub-fabric, whereas the muscovite defines a girdle around the X-axis. The sillimanite defines a plano-linear sub-fabric with a maximum value near the zone axis of the girdle defined by the muscovite.

The Shear Zone Granite has a magmatic fabric marked by the orientation of biotite crystals. The tectonic fabric is not homogeneous, with the intensity decreasing from the inner zone to the outer zone. The muscovite and the sillimanite sub-fabrics registered the paleo-conditions of strain at high grade deformation, that will survive later overprinted deformation.