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Kinematic evolution of the Mbakop Pan–African granitoids (Western Cameroon–Domain): an integrated AMS and EBSD approach

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Abstract

This study integrates anisotropy of magnetic susceptibility, microstructural and crystallographic preferred orientation (CPO) data from the Mbakop granitic pluton (MGP; Pan-African age) in order to decipher its kinematic evolution. The MGP lies close to NE-SW branch of Central Cameroon Shear Zone (CCSZ) and is emplaced in gneissic basement. High mean magnetic susceptibility and presence of multi–domain magnetite is recorded. Quartz CPO measured using Electron Backscatter diffraction reveals dominance of rhomb <a>, prism <a> and prism <c> slip in different samples, which is consistent with microstructures developed under upper greenschist/amphibolite facies conditions. Quartz CPO along with other kinematic indicators (feldspar porphyroclasts/mineral fish) indicates non-coaxial deformation was important during tectonic evolution of the MGP. Contrasting sense of shear is recorded implying multi-stage mylonitization in the Western Cameroon Domain. Top-towards-south sense of shear is related to regional D_2 deformation (613–585 Ma), while top-towards-north is related to D_3 (585–540 Ma). The magnetic fabric in MGP records D_3. The