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Emplacement Mechanism of Yuechengling Granitic Batholith of NE Guangxi, China

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The Yuechengling batholith of NE Guangxi of China is located next to the amalgamation boundary between the Early Paleozoic Yangtze and Cathaysia blocks. It is one of the best-known composite batholiths of granitoids in the Nanling Range of South China. The batholith is exposed over an area of 1390 km², extends in NNE-SSW direction into an elongated oval shape, and occurs in the core area of the Yuechengling anticlinorium. The main body of the batholith was emplaced in Caledonian (436-400 Ma) and Indosinian (224-211 Ma). The Caledonian intrusions make up most of the south part of the batholith, counting toward 76% of the total exposed area. The rest and the northern part of the batholith are made of mostly the Indosinian intrusions.

Both the Caledonian and Indosinian intrusions have similar characteristics of magnetic fabrics: the measured magnetic susceptibility ellipsoids are dominated by flattening type with E mostly ≥ 1 . The anisotropy degree P is relatively high around the contact zones and decreases towards center of the batholith. The magnetic foliation is largely in accordance with the contact zones. The pre-existing regional structures in the country rocks are considerably concordant with the contact zones due to strain accommodation during the emplacement. Evidently the main body of the batholith is syn-tectonic. The EW shortening caused by amalgamation of the Yangtze and Cathaysia blocks in the Caledonian generated nearly SN-trending Yuechengling anticlinorium. The deep-seated magmas ascended and were emplaced in the saddle reefs of the anticlinorium due to density inversion and vacuum-pumping effects caused by the saddle reefs. The Indosinian magmas were also emplaced into the subsequently doming saddle reefs due to similar Indosinian EW shortening. It is concluded that the Yuechengling batholith has a syn-tectonic doming emplacement mechanism.

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