Emplacement mechanism of Late Triassic granitic Dushan pluton, North China and its tectonic implications

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To better understand the Late Triassic tectonic setting in the northern North China Craton (NCC), a multidisciplinary investigation, including structural geology, geochronology, anisotropy of magnetic susceptibility (AMS) and gravity modeling, has been carried out in the Dushan pluton. The Dushan pluton consists of monzogranite and biotite-rich facies along the pluton margin without sharp contact between them. The granite varies southwestwards from isotropic texture to arcuate gneissic structures, with locally mylonitic structures. The intensity of solid-state deformation increases southwestwards across the pluton, leaving preserved magmatic fabrics in the northeastern part. The compatible outward dipping magmatic and solid-state magnetic fabrics, together with mesoscopic fabrics, define an elliptic dome-like pattern with a NE-SW oriented long axis, despite the fabrics dip inwards in the southeastern margin of the pluton. Combining gravity modeling, the Dushan pluton presents an overall tabular or tongue-like shape with a northeastern root. The magnetic lineations nearly strike NE-SW, concordant with the stretching lineations observed in the mylonitic zones. We propose the emplacement mode that the Dushan pluton emplacedsouthwards through the feeder zone in its northeast, beginning probably with a sill. The later successive magma batches may laterally and upwardly inflate, deform and even recrystallize the former cool-down magma. This inflation forms an arcuate, gneissic to mylonitic foliation in the southwestern margin. The Dushan pluton is considered as typically post-tectonic in emplacement, recording a Late Triassic post-tectonic setting of the northern NCC.