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Neoproterozoic tectonics: insight from the deformation of the Archean basement of North China Craton

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The controversy over the Archean tectonic regimes has lasted several decades focusing around horizontal and vertical tectonics, the two classical tectonic models for Archean times. Thus, more studies of the early crustal growth and tectonic evolution are requisite for better understanding geodynamic regimes in the early Precambrian. The North China Craton is one of the major Archean to Paleoproterozoic cratons in the world and oldest craton in China, which preserves a large amount of ancient basement and abundant structures showing the early earth tectonics.

In this study, we have carried out detailed structural analysis of two down-slip ductile shear zones which developed in eastern Anshan area and provided an example for revealing of Neoproterozoic vertical tectonics in the study area. There were also develop many structures of dome and keel style in the North China Craton, such as Qian'an, Qingyuan areas.

Based on abundant structural evidence and previous studies, we infer that the vertical tectonics is still the dominant model for Neoproterozoic crust growth and tectonic evolution in Anshan area. The formation of dome and keel structure, and the deformation of the down-slip ductile shear zones may have resulted from the sagduction of the banded iron formations and synchronous Archean granite dome emplacement, supporting a vertical tectonic regime in Archean times.