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**Late Neoproterozoic magmatism and tectonic evolution recorded in the  
Dengfeng Complex in the southern segment of the Trans-North  
China Orogen**

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**Abstract**

The Dengfeng Complex exposed in Songshan area in the southern segment of the Trans-North China Orogen (TNCO) mainly consists of Late Neoproterozoic tonalite-trondhjemite-granodiorite (TTG) gneiss, metadiorite and amphibolite. The Sanhuangzhai amphibolite records the earliest mafic magmatism ( $2658 \pm 5$  Ma) in the region, which is enriched in LREE and LILE with negative Nb, Ta and Ti anomalies, suggested to be the remnant of an arc-related juvenile mafic crust. The Shipaihe amphibolite at the end of Neoproterozoic ( $2492 \pm 7$  Ma) is characterized by flat REE pattern and slightly negative Nb, Ta and Ti anomalies, which is interpreted as large-degree partial melt of metasomatised mantle source in a back-arc basin. Zircon U-Pb dating shows two episodes of TTG magmatism (2.57–2.55 Ga and 2.55–2.50 Ga) within the Dengfeng Complex. All TTG gneisses have high  $\text{SiO}_2$  and  $\text{Na}_2\text{O}$ , but low  $\text{Mg}^\#$ , Cr, Ni,  $[\text{Yb}]_N$  and Y with high  $[\text{La}/\text{Yb}]_N$  and Sr/Y. The early TTG gneiss

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