

## Zircon U-Pb age and Hf isotope constraints on the Precambrian crustal evolution of the Ordos Block, North China Craton

CHENGLI ZHANG<sup>1</sup>, YONG SUN<sup>1</sup>, CHUNRONG DIWU<sup>1</sup>,  
LONGLONG GOU<sup>1</sup> AND JINGLAN LUO<sup>1</sup>

<sup>1</sup>State Key Laboratory of Continental Dynamics, Department of Geology, Northwest University, Xi'an, 71009, China

North China Craton (NCC) is one of the oldest Cratons in the world, and mainly composed of the Eastern and Western Block as well as Trans-North China Orogen (TNCO). Of which, Western Block is subdivided into north part of Yinshan Block and south part of Ordos Block. Except the Ordos Block, the Precambrian metamorphic basement are widely outcropped in other blocks, and their evolutionary history from Archean to Palaeoproterozoic was well constrained. However, the early crustal evolution of Ordos block is poorly understood due to thick covering of the Meso-Proterozoic and Phanerozoic stratigraphy.

To better constrain the Precambrian evolution for Ordos Block, we carried out in-situ U-Pb dating and Lu-Hf isotopic analyses on zircons of the granitic gneisses from the drill holes in the Ordos Block. The U-Pb dating reveals that their protolith were formed at 2.49, 2.16 - 2.14 Ga, and 2.04 - 1.99 Ga. Their  $\epsilon_{\text{Hf}}(t)$  range from -3.53 to 4.81 for 2.49 Ga gneisses with  $T_{\text{DM}}^{\text{C}}$  of 3.07~2.66 Ga, from -9.75 to 9.79 for 2.16 - 2.14 Ga gneisses with  $T_{\text{DM}}^{\text{C}}$  of 3.10~2.14 Ga, and from -12.23 to 4.39 for 2.04 - 1.99 Ga gneisses with  $T_{\text{DM}}^{\text{C}}$  of 3.13~2.27 Ga, indicating heterogeneous source material involving both older reworked and juvenile components. In addition, a 3.40 Ga inherited zircon with a characteristic of magmatic zircon was determined from the 2.16 Ga granitic gneisses, providing a direct evidence for the existence of Meso-Archean crust in the Ordos Block and implying that the Meso-Archean crust was possibly more widespread than previously thought in the NCC.

Combined with the data of the zircon U-Pb ages and Hf isotopes from other block of NCC, our new results suggested that Ordos Block possibly formed in the Meso-Archean, and became an important part of NCC at ~2.5 Ga, and then experienced similar tectonic evolution with the Eastern Block and TNCO during the Paleo-Proterozoic.