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## Detrital Zircon U-Pb Ages of the Proterozoic Metaclastic-Sedimentary Rocks in Hainan Province of South China: New Constraints on Depositional Times, Provenances, and Tectonic Implications

HU Guocheng<sup>1,2</sup>, WANG Zhilin<sup>1,3</sup>, XU Deru<sup>1,\*</sup>, CAI Jianxin<sup>4</sup>, WU Chuanjun<sup>1,2</sup>, YU Liangliang<sup>1,2</sup>, SHAN Qiang<sup>1</sup>, HOU Maozhou<sup>1,2</sup>, CHEN Huayong<sup>1</sup> and Monika Agnieszka KUSIAK<sup>5</sup>

*1 Key Laboratory of Mineralogy and Metallogeny, Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China*

*2 University of Chinese Academy of Sciences, Beijing 100049, China*

*3 School of Geosciences and Info-Physics, Central South University, Changsha 410083, China*

*4 Laboratory of Oceanological Geology, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou 510301, China*

*5 Institute of Geological Sciences, Polish Academy of Sciences, Warszawa 00-818, Poland*

Shilu Fe-ore deposit, one of the most renowned Fe-ore deposits in China, is hosted in two Precambrian strata, i.e. Shilu Group and overlying Shihuiding Formation, from Changjiang County, western Hainan Province (Xu et al., 2013, 2014). However, the compelling depositional time-intervals for these Precambrian successions, as well as the depositional tectonic settings and potential sources for precursors of these successions, have been controversial (e.g., SCISTCAS, 1986; Yao et al., 1999; Li et al., 2008). This is attributable to the rareness of the precise and accurate geochronological data as well as the multistage, polyphase structural deformation and metamorphism of up to amphibolite even granulite facies, which mask desired information on protoliths to the Precambrian successions in Hainan Island (SCISTCAS, 1986; Xu et al., 2013, 2014). In this contribution, abundant detrital zircons from the two Precambrian sedimentary successions have been carried out for LA-ICP-MS and SHRIMP U-Pb dating, which provides an inference about their spatio-temporal correlation, maximum depositional time, erosional provenances, depositional tectonic settings, and paleogeographical reconstruction of Hainan Island (e.g., Li et al., 2008; Zhao and Cawood, 2012).

Most of the detrital zircons from both the Shilu Group and overlying Shihuiding Formation are subrounded to rounded in morphology and characteristic of having an age spectrum between 1.9 and 1.0 Ga enclosed by one

predominant peak at 1486-1328 Ma, two subordinate peaks at 1734 Ma and 1068 Ma, and two minor peaks at 1831 Ma and 1221 Ma. There are also two less important age clusters between 3150 Ma and 2300 Ma with the peak at 2451-2591 Ma, and between 2100 Ma and 1950 Ma with the peak at 1994 Ma. Angular or subangular detrital zircons occur only in minimal amount but also have a spread of ages as well. The similarity in age distribution, which is distinct from that of South China (e.g., Yu et al., 2008; Shu et al., 2011), but mainly resembles that from the Laurentian continent (Hoffman, 1991; McAteer et al., 2010 and references therein), suggests a similar or same depositional system for both the Shilu Group and the Shihuiding Formation. In line with the geological and paleontological evidences (SCISTCAS, 1986; Yao et al., 1999; Xu et al., 2013), the latter is better re-interpreted as the top, Seventh sequence of the Shilu Group and thus, the name of the Shihuiding Formation should be discarded.

At least two erosional sources were involved in deposition of the studied detrital zircons, one nearby to provide the least abraded zircons and the other remote or recycled to input the largely abraded zircons. The predominance of texturally mature over immature zircons implies a tectonic setting relatively stable when deposited. The youngest zircons which were dated at ca. 1.2-1.0 Ga with a peak at ca. 1066-1011 Ma may define the maximum deposition time of the Shilu district and interbedded host rocks as the Latest Mesoproterozoic. Given the

\* Corresponding author. E-mail: xuderu@gig.ac.cn

Precambrian tectonics of Hainan, a retroarc foreland basin is proposed for accumulation of the Shilu district and related strata during this period of time (Xu et al., 2013, 2014). The present zircon U-Pb dating results, however, reveal that Hainan Island has not the same crystalline basement as either the Cathaysia or the Yangtze Blocks of South China, and thus the Island as an independent fragment was most likely attached or close to Laurentia before the Rodinia breakup.

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