The Dupal Peak Isotopic Characteristics of Paleo-Asian mantle domains

XI-JUN LIU[1]*, LIN GUO[1], PATERNO R CASTILLO[2], WEN-JIAO XIAO[3], JI-FENG XU[1,4], YU SHI[1] AND BIN XIONG[1]

[1]Guangxi Key Laboratory of Hidden Metallic Ore Deposits Exploration，Guilin University of Technology, Guilin, 541004, China (*Correspondence author: xijunliu@gmail.com)

[2]Scripps Institution of Oceanography, UCSD, La Jolla, CA, USA

[3]Xinjiang Research Center for Mineral Resources, CAS, China

[4]State Key Laboratory of Isotope Geochemistry, GIG, CAS, China

The DUPAL anomaly has been investigated in the Paleozoic Paleo-Asian oceanic sub-mantle and this anomaly can trace earlier to 370Ma, even to 570 Ma ago. Combine previous studies indicating the DUPAL mantle isotope signatures of Neo-Tethys and Paleo-Tethyan sub-oceanic mantle, suggest the DUPAL is the largest scale and longest existed isotopic anomaly in Earth's mantle. We compile the Pb isotope data from Modern Pacific, Indian MORB, Neo-Tethys ophiolite (90-150Ma), Paleo-Tethyan ophiolite (190-350Ma) and Paleo-Asian ophiolite (300Ma-570Ma), to trace the isotopic evolution of the DUPAL mantle domain with time. Found a very interesting finding that there was a "DUPAL peak" existing during 300Ma-400Ma for both Paleo-Tethyan and Paleo-Asian mantle domains (Fig 1). Owing to the high temperature required for deep mantle plume or shallow mantle of SCLM delamination to produce the extreme DUPAL peak, we suggest the "DUPAL peak" probably related to a certain ancient thermal event during 300Ma-400Ma of earth's history.

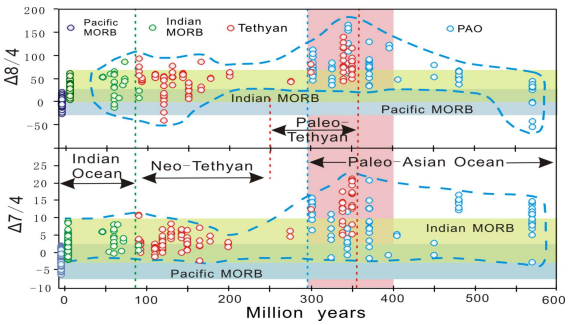

Figure 1: the Pb △7/4 and △8/4 evolution with the time

Acknowledgement: This work is supported by NSFC funds (No. 41302041, 41302155), Guangxi NSF (No. 2012GXNSFCA053007), China Postdoctoral Science Foundation Grant (2013M530440), 2013 Bagui Scholar Innovation Project of Guangxi Province (to Xu JF) and Lijiang Scholar Innovation Project of Guilin (to Xiong B).