

**THEME 4:  
THE EARTH'S SURFACE**

**Session 4.0:  
OPEN SESSION  
(posters exclusively)**

ORGANISED BY:  
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This session presents posters on the general topic of the Earth's surface, including several on the application of specific techniques.

**4.0.P01**

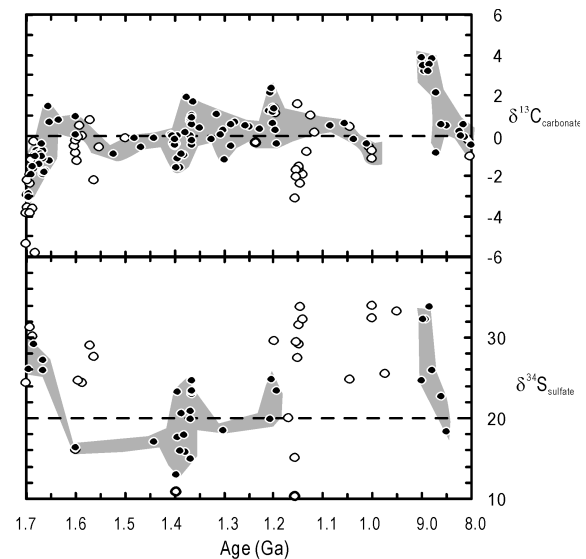
**S and C isotopic records from 1.7 to  
0.8 Ga carbonate successions of  
Jixian Section, North China**

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Marine carbonate successions from ca. 1.7 to 8 Ga, deposited on the North China Platform, were studied in order to document secular variations in  $\delta^{13}\text{C}$  and  $\delta^{34}\text{S}$  of Proterozoic seawater. All the carbonate samples, most dolostones, were collected from the Jixian Section near Beijing, in which carbonates mostly occur continuously in the upper Changcheng Group, Jixian Group, and upper Qingbaikou Group, respectively equivalent to late Paleo-, Meso-, and early Neoproterozoic. By extracting trace sulfate associated with carbonate minerals, coeval  $\delta^{34}\text{S}$  value of seawater sulfate can be obtained from the same carbonate samples with  $\delta^{13}\text{C}$  value of carbonate.

$\delta^{13}\text{C}_{\text{carbonate}}$  and  $\delta^{34}\text{S}_{\text{sulfate}}$  values display distinct stratigraphic and temporal variations (see fig.). Solid circles indicate the unaltered or least altered samples with  $\delta^{18}\text{O}_{\text{PDB}} > -10\text{‰}$  and  $\text{Mn}/\text{Sr} < 10$ . Secular variations in C and S isotopes of the Proterozoic seawater, thus, can be restricted probably through the gray areas.



For late Paleoproterozoic of ca. 1.7 to 1.6 Ga,  $\delta^{34}\text{S}_{\text{sulfate}}$  descends from 32‰ to 16‰ whereas  $\delta^{13}\text{C}_{\text{carbonate}}$  ascends from -3‰ to 1‰. Mesoproterozoic two positive shifts of ca. 1.4 and 1.2 Ga cause that  $\delta^{13}\text{C}_{\text{carbonate}}$  attains or exceeds 2‰ and  $\delta^{34}\text{S}_{\text{sulfate}}$  approaches or really exceeds 25‰. Large negative excursions, over 4‰ and 15‰ for C and S isotopic compositions respectively, occur during early Neoproterozoic of ca. 0.9 to 0.8 Ga.