# Constraints on the Zn isotopic evolution in Early Ediacaran ocean: A Zinc isotopic study of Neoproterozoic Cap Carbonates in South China

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The Ediacaran cap carbonates deposited on continental shelves worldwide after the Snowball Earth. The $\delta^{66}Zn$ values of cap carbonates from South Australia were obtained to reconstruct the Zn isotope evolution which probability has a global consistent feature (Kunzmann et al., 2013). To determine whether the reported evolution extends to the global scale in the early Ediacaran oceans, we measured the Zn isotope ratios of the cap carbonates in the Three Gorges region, South China.

At the Jiulongwan section, the cap carbonates unit at the base of the Doushantuo Formation, approximately 6.0 m in thickness, can be subdivided into three subsequences in ascending order. The low subsequences is ca.1m-thick of cap carbonate and shows brecciated structure with irregular quartz veins. The middle part of cap carbonate (ca.3.0 m) consists of a lower, thickly-bedded laminated dolomite. The rest of cap carbonates (ca.2.0 m) is composed of thin-and medium-bedded laminated dolomictite.

The positive $\delta^{66}Zn$ values in the Jiulongwan section exist a decline from +0.68‰ to +0.47‰ in the basal 3-m interval, followed by a sharp increase to the highest value of 0.97‰ at 4.6-m depth, and the upper most part with a negative excursion in $\delta^{66}Zn$ back to +0.63‰. Similarly, a negative excursion and a positive excursion are also observed in the Nuccaleena sections (Kunzmann et al., 2013). The $\delta^{66}Zn$ of the basal 1-6m interval have a negative shift from 0.47‰ to 0.07‰, followed by a rapid positive excursion in the middle and upper part of cap carbonates elevate to the crest value of 0.87‰, and the upper most part with an obscure negative excursion compared with the Jiulongwan section.

The cap carbonates deposited in South China and South Australia with similar $\delta^{66}Zn$ values and uniform stratigraphic trend suggested that Zinc isotopes can be used as a global proxy for ocean conditions and zinc biogeochemical cycling in early Ediacaran Period.