

Assessing the Lomagundi–Jatuli carbon isotope excursion in Fennoscandia with multiple stable isotope systems in carbonates

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Carbonates enriched in heavy carbon isotopes (bearing $\delta^{13}\text{C}$ values greater than 5‰ relative to VPDB) are a hallmark of Paleoproterozoic rocks from roughly 2.3 to 2.1 Ga. These carbonates define the Lomagundi–Jatuli positive carbonate carbon isotope excursion and appear to be broadly synchronous across several cratons, given current age constraints¹. The excursion has been variably explained by local, basin-wide mechanisms or global changes to the ocean-atmosphere carbon reservoir, but important questions remain about the nature and extent of the excursion, as well as its connection to organic matter burial, oxygen production, and Paleoproterozoic redox and climatic changes.

We examine the expression of the Lomagundi–Jatuli excursion in the FAR-DEEP cores drilled in Fennoscandia by the ICDP (International Continental Scientific Drilling Program). Previous study of these cores documented carbonate $\delta^{13}\text{C}$ values ranging from +5‰ to +15‰^{2,3}. By combining multiple stable isotope systems, including all the major stoichiometric components of the carbonate minerals (carbon, oxygen, calcium, and magnesium), we offer new ways to understand the context, preservation, and representativeness of the carbon isotope excursion in this region.

[1] Martin et al. (2013), *Earth-Science Reviews* 127, 242–261. [2] Brasier et al. (2011), *Precambrian Research* 189, 193–211. [3] Reuschel et al. (2012), *Precambrian Research* 192–195, 78–88.