

## **Do the sedimentary archives of the São Francisco and Amazonian cratons record early Paleoproterozoic glacial events?**

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Sedimentary reconstructions in North America, Australia and South Africa indicate that the rise of atmospheric O<sub>2</sub> during the Great Oxidation Event (GOE, 2.5 to 2.3 Ga ago) was coeval with at least 3 and possibly 4 glacial events, some of which of global extent (snowball Earth). Evidence for such glacial conditions are missing in cratons of similar age from Brazil. Here, we provide a refined geochronological and stratigraphic framework for the Minas and Carajás basins of the São Francisco and Amazonian cratons, respectively.

In the Minas Basin, detrital zircon U-Pb dating shows an unexpectedly long ( $\geq 60$  Myr) stratigraphic hiatus during the early Paleoproterozoic, which is overlapping most of the time window during which the main glacial events occurred. In the Carajás Basin, no conclusive geochronological evidence for early Paleoproterozoic deposits has been found so far. This also argues for a long stratigraphic hiatus between 2.7 and 2.3 Ga. These stratigraphic gaps in Minas and Carajás basins could have been induced either by regional tectonic events (Transamazonian orogeny) or by sea level variations related to the glaciations. To test these hypotheses, we carried out provenance analyses using mixture modeling to determine the number, age and contribution of individual zircon populations in each sedimentary succession. Modeling results suggest a tectonic origin for the stratigraphic gap of the Minas Basin, while the one from the Carajás Basin is better explained by sea level variations, possibly linked to glacial events.