# NEOPROTEROZOIC GLACIAL EVENTS IN THE AMAZON CRATON AND IN THE PARAGUAY BELT.

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Two Neoproterozoic glacial incursions related to the Marinoan (~ 630Ma) and Gaskiers (~570Ma) glacial events have been registered below the sediments of Parecis Basin on the Southeastern border of the Amazon Craton (Della Giustina et al., 2005). Limestone and dolostone occur both on Neoproterozoic and Paleozoic sedimentary sequences (Alvarenga et al., 2004, Alvarenga & Dardenne 2004). For instance, drill 2-SM-MT (Petrobrás – Salto Magessi), with 5749 m long, has crosscut two carbonates units separated by 550 m of pelites and diamictites of unknown age. The sequence lacks fossils and others elements to allowing dating. Also supported by C, O and Sr isotope data, this study aims to correlate the lithostratigraphic sections recognized along the Neoproterozoic outcrops on the border of the Amazon Craton with the sedimentary rocks observed in the drill of the Parecis Basin.

The lower part of the Parecis Basin sequence between 3900 and 5779 m, has been divided from the base to the top, into five intervals (Fig. 1). The first interval (5779 – 5610 m) is represented by arkose sandstone. The second interval (5610 – 5150 m) comprises a sequence of dolostone and limestone showing nodular anhydrite that is locally replaced by calcite and gypsum. The $\delta^{13}C_{PDB}$ values for samples along this interval ranges between –1.7 and +5.0‰, and the $^{87}Sr/^{86}Sr$ ratios vary from 0.70708 and 0.70747. The third interval (5150 – 4580 m) consists manly of black shales interlayered with diamictite, sandstone and conglomerate. The fourth interval (4580 – 3975 m) is composed by limestone and dolostone with anhydrite and columnar stromatolites. The $\delta^{13}C_{PDB}$ values of this last interval are negative with incursion varying from –6.9 to –0.1‰ and the $^{87}Sr/^{86}Sr$ ratio around 0.70776. The fifth interval is characterized by siliciclastic rocks ranging from sandstone to conglomerate.

Two Neoproterozoic carbonate sequences have been described along the southwestern border of the Parecis Basin. A lower carbonate sequence occur within the Neoproterozoic Araras Group, as a thin cap dolomite (~20m) overlying the inner shelf glacial Puga Formation. The cap dolomite has strong negative $\delta^{13}C_{PDB}$ values that range between –10,5‰ and –2.7‰. The limestone and mudstone place above the cap dolomite presents carbon isotope values ranging from –3.8‰ at the base to +0.1‰ at the top and $^{87}Sr/^{86}Sr$ ratios ranging from 0.70740 to 0.70780 (Alvarenga et al., 2004, Alvarenga et al., submitted). This sequence is followed by a thick (1100 m) shallow-water dolostone marked mostly by uniform positive $\delta^{13}C_{PDB}$ (+1.9‰) and by narrow interval of positive carbon isotope values (up to +9.6‰) at the top of the sequence (Alvarenga et al., 2004). These data characterize the Marinoan Glacial event in the Paraguay Belt.

An upper carbonate sequence occurs as lenses within pelite that overlies the diamictite of the Serra Azul Formation. These rocks have negative $\delta^{13}C_{PDB}$ values, with incursion from –6.53‰ to –3.21‰, and $^{87}Sr/^{86}Sr$ ratios between 0.70860 and 0.70880 (Figueiredo, 2006 and Figueiredo et al., 2006). These new data allow to recognize the Gaskiers glacial event in the Paraguay Belt.

Based on lithostratigraphic features C-O-Sr isotopic data we suggest that the two carbonate sequences identified along the 2-SM-MT drill (Parecis Basin) may be correlated with the two Neoproterozoic carbonate sequences observed in the Paraguay Belt.

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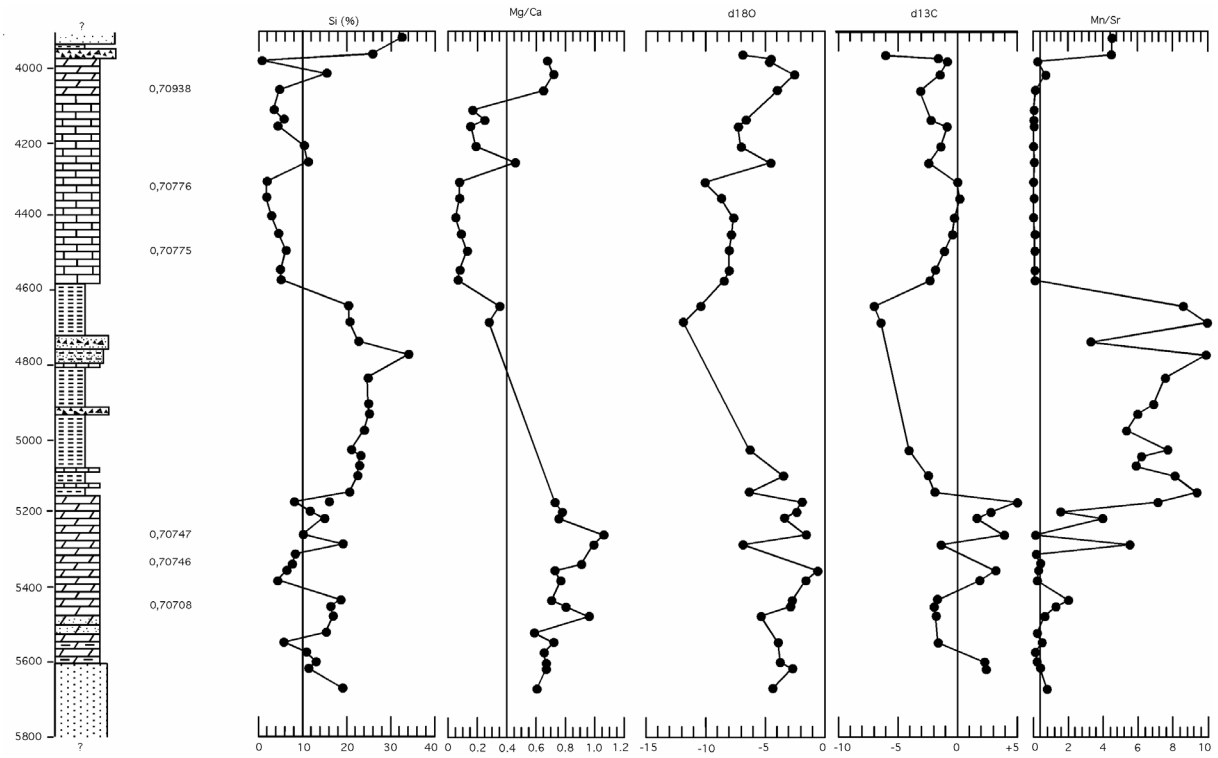


**Figure 1:** Stratigraphic section and variations of $\delta^{13}C_{PDB}$, $\delta^{18}O_{PDB}$, $^{87}Sr/^{86}Sr$ and geochemical data of Carbonates from Parecis Basin (Amazon Craton).