



Landscape and glacial history of the Shackleton Range, Weddell Sea Embayment Antarctica: Insights from a cosmogenic multi-isotope approach

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Studies using cosmogenic nuclide analysis in Antarctica have the potential to provide unique insights into Pleistocene ice sheet fluctuations and long term landscape evolution. Here we report one of the first attempts to integrate cosmogenic ^{21}Ne , ^{10}Be and ^{26}Al in quartz from bedrock summits and plateaus of the Shackleton Range, a part of the uplifted passive continental margin of the Transantarctic Mountains.

By analysing both stable and radiogenic cosmogenic nuclides we are able to quantify differential patterns of erosion and preservation throughout the varied geomorphic settings of the Shackleton range. The results are intriguing. The concentrations of the ^{26}Al and ^{10}Be suggest simple exposure histories with little or no prior exposure and minimal erosion. In comparison, the cosmogenic ^{21}Ne concentrations are in excess of that expected from the radionuclides, indicating substantial periods of burial with minimal erosion of some of the summits within the range.

When combined with geomorphological observations these data provide insights into the history of the East Antarctic Ice Sheet and its relationship with the landscape

evolution and tectonics of the Shackleton Range over millions of years. The results highlight the importance of integrating stable cosmogenic isotope ^{21}Ne in studies of this kind, and the limitations of interpretations based solely on the radioisotopes ^{26}Al and ^{10}Be .