

# A study of (<sup>234</sup>U/<sup>238</sup>U) disequilibrium and comminution dating boundary conditions along the Antarctic Peninsula

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## Abstract

Comminution dating is a novel dating approach based on the disequilibrium of U decay series in fine clastic particles. This method provides an estimate of the length of transport time of sediments from source to sink and can potentially constrain the rates of continental weathering processes, including rate of sediment discharge in icebergs. One of the primary caveats of this method is lack of understanding of the initial boundary conditions of the U decay series in freshly eroded continental material.

Here, it is proposed to conduct a systematic survey of the initial (<sup>234</sup>U/<sup>238</sup>U) conditions and their downstream evolution along the Antarctic Peninsula, a major source of sedimentary material in the Weddell Sea and the Southern Ocean. In addition, a high-resolution study of several semi-enclosed basins on the eastern margins of the Antarctic Peninsula (Fig. 1) will include a quantitative comparison between sediments and proximal source bedrock. The compiled (<sup>234</sup>U/<sup>238</sup>U) data will be used to establish a systematic description of the composition and evolution of (<sup>234</sup>U/<sup>238</sup>U) ratios in continental environments, and subsequently, to constrain and refine the comminution ages of Weddell Sea sediments (Fig. 2).