Development of a methodology for correcting meteoric 10Be inventories for incomplete retention in acidic soils

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Résumé

Understanding soil processes is important for soil survey, ecological and biogeochemical modelling, agronomy, soil fertility and land-use management. Meteoric 10Be isotope (10Bem) is commonly used as a geochemical tracer of soil processes over long time scales ($>$ 103 years), and allows one to quantify physical erosion, and soil weathering rates based on 10Bem inventories. Despite the large potential for soil studies, the use of 10Bem in soils is not yet well constrained. The 10Bem can be lost by leaching and deep percolation in well-developed, acidic soil profiles. It is therefore important to explore the potential incomplete retention of 10Bem and correct for it while using meteoric 10Be to constrain soil processes. Along a climosequence in Santa Cruz island (Galapagos archipelago), 11 soil profiles have been sampled to explore the mobility of 10Bem in the soil system. A large range of soil development and acidity is observed along the climosequence. Several sites covering the geochemical variability along the climatic gradient will be used to develop a methodology based on 9Be chemical mass balances to correct 10Bem inventories for incomplete retention.

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