# Climatic controls on paleo-erosion rates in mid-latitude monsoon regions

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Erosional processes influence atmosphere geochemistry through $CO_2$-consuming weathering reactions. Therefore, reconstructing paleo-erosion rates, and thereby to constrain climate effect on erosion rates, is important to understand the feedbacks within the Earth system. Recently, in situ cosmogenic nuclides in ancient fluvial sediment have been successfully applied to estimate glacial-interglacial changes in erosion rates [1, 2, 3]. However, this method is limited to fortuitous settings. Here we present an alternative approach to reconstruct paleo-erosion rates using depth profiles of in situ cosmogenic nuclides. In order to quantify the relationship between monsoon intensity and erosion, we focused on the Sefuri Mountains, Japan, where mean annual precipitation exhibited a marked increase at onset of Holocene. Since deeper samples contain low levels of $^{10}$Be and $^{26}$Al, some requirements have to be fulfilled for accurate measurements. In this presentation, we first report $^{10}$Be/$^{9}$Be values of the carrier solutions and then present depth profiles of $^{26}$Al. We focused on $^{26}$Al because the background of $^{26}$Al is much smaller than that of $^{10}$Be, which allowed us to conduct accurate AMS measurements even though the ratios were low. The measured concentrations are lower within upper sections and higher within lower sections than the theoretical curves for constant erosion. This indicates that the erosion rates during the last glacial in the study area were lower than those of Holocene. On a global perspective, comparison with other records from mid-latitude monsoon regions to high-latitude regions that experienced glacial and periglacial activities suggest contrast patterns of paleo-erosion rates across a glacial-interglacial cycle.

[1] Schaller & Ehlers (2006) *EPSL* **248**, 153-167. [2] Hidy *et al*. (2014) *EPSL* **390**, 209-221. [3] Marshall *et al*. (2015) *Sci. Adv*. 1:e1500715.