「最古の氷」に対する$^{26}Al/^{10}Be$放射年代決定の可能性：ドームふじ第二期深層コアからの洞察

On the possibility of radiometric dating on the “oldest ice” using cosmogenic $^{26}Al/^{10}Be$ ratio: Insights from the Dome Fuji second deep (DF2) ice core

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Deep ice core records have been playing a crucial role in paleooclimatology. However, there are no records that have reached over ca. 800 ka. To overcome this problem, several research groups are planning to recover the “oldest ice” (~1.5 Ma) from near the bases of ice-sheets overlying inland Antarctica (see e.g. Schiermeier, 2016). Nevertheless, it may be not an easy task to obtain an accurate chronology from such deepest parts of ice cores, because layer inclination and/or folding may prevent us to construct accurate stable-isotope chronologies, which usually rely on normal stratigraphy.

Cosmogenic ^{26}Al and ^{10}Be are produced by interactions of comic rays with specific elements in the atmosphere. Because the atmospheric production is similar between ^{26}Al and ^{10}Be, an exponential decrease of the $^{26}Al/^{10}Be$ ratio with time, in ordinary cases, should represents the difference of the decay constants of the nuclides ($T_{1/2}$ of the $^{26}Al/^{10}Be$ ratio is 1.45 Myr). In this presentation, we show the profiles of the $^{26}Al/^{10}Be$ ratios of certain stratigraphic intervals of the Dome Fuji second deep (DF2) ice core, plotted against the latest age model for this core (Dome Fuji ice core project members, 2017). By investigating these data, we discuss about the possibility of the radiometric dating on the “oldest ice” of an age of up to 1.5 Ma.

