

## Highly precise depth control method for precise correlation of paleoclimate records

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Considering the spatio-temporal variation of paleoclimate, it is important to establish precise age depth model independent from proxy data and correlate each data and location precisely. In terms of the age, absolute / relative dating methods are used and developed to minimize the error of age estimation and correlation.

On the other hand, it is necessary to estimate the error of the depth itself to connect paleoclimate data (paleoclimate vs. depth) and age data (age vs. depth) precisely.

In the case of sediment core, there are cases when the part of the core is lacked or the shape is changed in a scale of ~cm caused by drilling, splitting and time course. The depth errors caused by these events correspond to 10 - 10000 years in the age scale. This error cannot be ignored relative to reduced error of age estimation methods. Therefore, precise depth control and evaluation of these errors are important to constrain the age error of paleoclimate data.

In the KR15-10 cruise carried near Wakasa-Bay, we corrected piston core samples in multiple locations with different depth to establish the correlation network between sediment cores taken from Japan Sea and Lake Suigetsu. In this cruise, depth control method established in Lake Suigetsu drilling projects (SG06/12/14) is applied to reduce the error of the depth.

Based on high resolution photographs of half split cores and description of the position of marker layers in each processes of the sediment core, correlation, mutual complement and depth conversion is conducted between multiple sites, holes, half-split cores and sub-samples on software. As a result, a composite depth scale is established which is compatible to each core and its data in 1mm precision which corresponds to 10 years in the sediment of Japan Sea.

This depth control method is also applied to micro tephra sampling and analysis which enables us to correlate multiple locations and other core sites.

In this presentation, we would provide the method of depth control applied in KR15-10 cruise and future prospects.

Keywords: Japan Sea, Lake Suigetsu, Age depth model