鮮新統安房層群安野層の古地磁気ー酸素同位体複合年代層序
Pliocene magneto–oxygen isotope stratigraphy from the Anno Formation, Awa Group, central Japan

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The Pliocene climate is one of the best analogs for the climate of a globally warmer future. Here, we present a new Pliocene integrated chronostratigraphy from the Anno Formation in the uppermost Awa Group, which is distributed throughout the Boso Peninsula, central Japan, based on paleomagnetic and benthic foraminiferal oxygen isotope records. This new chronostratigraphy provides valuable constraints for paleoceanographic and paleoclimatic studies in the northwestern Pacific Ocean, where the number of paleoceanographic records is limited due to the lack of calcareous microfossils from deep-sea sediment cores, with the exception of some plateaus at water depths above the calcite compensation depth (CCD).

We performed progressive Alternating field and thermal demagnetizations for each specimen in order to remove secondary remanence. Additionally, we conducted thermomagnetic, low-temperature magnetic, magnetic hysteresis, and FORC analyses as rock-magnetic experiments to assess stability of paleomagnetic signal which specimens have acquired. The paleomagnetic and rock-magnetic experiments indicate that primary remanences are carried by magnetite in pseudo-single domain size as detrital remanent magnetization. The progressive AF demagnetization is, however, unsuitable to remove secondary remanence in specimens from polarity transitional horizons due to magnetically hard mineral, such as goethite. Therefore, thermal demagnetization is necessary to obtain primary remanence from the Anno Formation.

Paleomagnetic results by the thermal demagnetization indicate that the Anno Formation corresponds to the period extending from the Nunivak normal polarity subchronozone (4.493–4.631 Ma) to Chron C2An.2n (3.116–3.207 Ma). Although foraminifera are not found in the middle Anno Formation, our oxygen isotope records from the upper and lower Anno Formation demonstrate the recording of glacial–interglacial cycles. However, the amplitude of our $\delta^{18}O$ profile is much larger than that of the LR04 stack, with similar to slightly lower glacial values and much lower interglacial values. This trend is suppressed after 3.4 Ma. These observations imply that the bottom water had lower $\delta^{18}O$ values and/or a warmer water mass during interglacials until 3.4 Ma compared with global average deep-water regions.

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