

Cyclo-stratigraphy of the Pliocene-Miocene interval in the Japan Sea sediments and timings of paleoceanographic changes

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Middle Miocene - Pliocene paleoceanographic changes have been reconstructed using deep-sea sediments from Atlantic and southern Pacific at high-resolution [e.g., Westerhold et al., 2005]. The results revealed a close linkage between changes in ice volume and changes in orbital parameters. However, an orbitally-tuned continuous age model for the Middle Miocene to Pliocene has not been yet established in the North Pacific. Therefore, high-resolution age model is necessary to correlate to other climate record and reconstruct paleoceanographic change in this period.

Since the Middle Miocene the Japan Sea has been a semi-closed marginal sea. Because the sea has been connected with the north Pacific by relatively shallow sills, its paleoceanographic condition has been sensitive to glacio-eustatic sea-level changes.

In this study, we utilize Integrated Ocean Drilling Program cores recovered from Sites U1425 and U1430 during Exp. 346. We constructed continuous sedimentary records at these two sites by revising the shipboard splices. Based on revised splices and a biostratigraphically-based age models [Kamikuri et al., in press], we converted GRA data from depth series to time series, extracted ca. 400- and 41-kyr cyclicities. Then, we tuned them to 400-kyr eccentricity cycle and 41-kyr obliquity cycle, respectively, to construct orbitally-tuned age models.

Based on this orbitally-tuned age model, we examined temporal changes in element composition of the sediments analyzed by XRF core scanner (ITRAX) to explore its paleoceanographic implications.

In the presentation, we will discuss the timings of paleoceanographic events observed in the Japan Sea and their relation with other paleoclimate events.

Keywords: Miocene-Pliocene, the Japan Sea, Cyclo-stratigraphy, XRF core scanner, IODP Exp.346