



High-resolution sea-ice and ocean circulation history during 18 Ma: upper 200 m core section obtained by IODP Expedition 302 (ACEX)

T. Sakamoto (1), K. Iijima (1), and S. Sugisaki (1, 2)

(1) Institute for Research on Earth Evolution (IFREE), Japan Agency for Marine-Earth Science and Technology (JAMSTEC) (tats-ron@jamstec.go.jp / Fax: +81-46-867-9775 / Phone: +81-46-867-9803), (2) Department of Polar Science, The Graduate University for Advanced Studies, c/o National Institute of Polar Research

Arctic Ocean is a part of cryosphere that has great role on the Earth climate system. Sea-ice cover, ice sheet, and land snow in the cryosphere has a positive feedback effect on the climatic system by its high albedo. In the Arctic Ocean, especially, there is no landmass around the North Pole, large sea-ice has a significant influence on thermohaline circulation since dense and saline water (brain water) forms temporally with the sea-ice. The dense outflow of the Arctic water mass is though to have a great impact to the formation of the North Atlantic Deep Water and a cause for Northern Hemisphere Glaciation. The ice in the Arctic Ocean also has inhibitive effect on heat transportation between the atmosphere and ocean. Ice rafted debris (IRD), a series of terrigenous grains, is transported by floating ice in the sea such as sea-ice and iceberg. It is one of many useful paleoceanographic proxies to reconstruct ice history from marine sediments. Terrigenous clastic grains are incorporated into sea-ice and icebergs through fluvial supply, coastal suspension freezing, cliff-fall and so on.

In order to reconstruct and reveal the ice history in the central Arctic Ocean, we conducted new non-destructive sediment core scanning techniques, the TATSCANs, that is a code name of developing original instruments for non-destructive sediment scanning and imaging in range of millimeter and micrometer scale. Sediment cores (200 m, ~18Ma) from the central Arctic Ocean obtained by IODP expedition 302 (ACEX)

were analyzed with high spatial resolution by non-destructive transparent X-ray, spectroscopic, XRF imaging scanners, TATSCANs. In this presentation, we reported results of non-destructive measurements of TATSCANs for the upper 200m cores obtained by the ACEX on the data, we discussed about a history of sea-ice and related ocean circulation including ocean circulation and river-runoff from the land during 18 Ma.