表層係留系を用いた夏季の南極海における経時観測

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Time-series observations using surface drifters in the Antarctic Ocean in summer

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To understand carbon cycling processes in relatively a short time scale, a newly developed surface drifter was deployed at a station (60ºS, 110ºE) in the Antarctic Ocean in austral summer during the JARE (Japanese Antarctic Research Expedition) 52 and 53 (from the beginning to the end of December). The array of the drifter system consists of GPS buoy, a photic zone carbon observing system (PZCOS) at 25 m depth and an export flux observing system (EFOS) at 75 m depth. We successfully obtained time-series data on various environmental and biological variables with high time-resolution (a few days interval). The drifters were primarily transported with ACC (Antarctic Circumpolar Current) moving eastward, and often met with irregularly distributed gyres. The present Lagrangian observation during the JARE52 showed a marked change in salinity and in situ fluorescence at 25 m depth found in the middle of December, probably due to the disturbance of counterclockwise gyre (about <50 km in diameter) (Fig. 1). The small-scale physical disturbance ~~of~~ with ~~relatively~~ less saline surface water induced the increase of phytoplankton abundance. This suggests that the drifter developed in this study can be used for Lagrangian observations with multiple purposes, although we should pay attention to small-scale physical disturbances that affect the primary productivity.

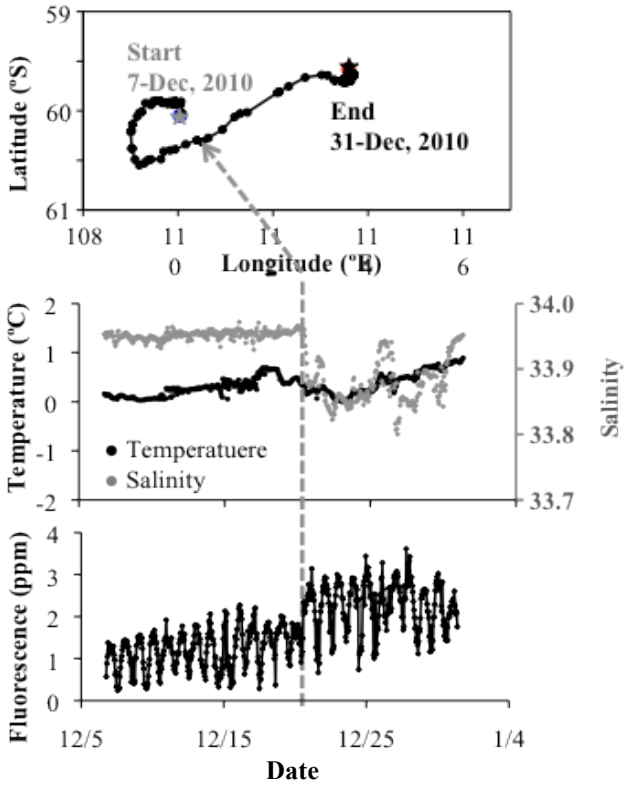

Fig. 1. GPS track of surface drifters (upper) and temporal changes in temperature, salinity (middle) and in situ fluorescence excited at 435 nm (lower) at 25 m depth during the JARE52. An arrow with a dashed line indicates the position and time of changing water properties.