

The prospect of the observation around the unexplored area in the Southern Ocean

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The primary processes and the mechanism of the various kinds of interactions should be elucidated to understand the changes in the Southern Ocean and the Antarctic ice sheet from the viewpoints of giant reservoirs of heat, water and carbon dioxide, which drive changes in the global climate and ecological system. Especially, the interactions around the boundary between ice sheet and ocean, namely ice shelf and sea ice areas, are key in the context of the Southern Ocean and the Antarctic ice sheet, and the field observation data around this area is essential. However, the field observation data around ice shelf and sea ice areas is very poor because of the difficulties with the observation. The acquisition of the field observation data in the unexplored area around the boundary between ice sheet and ocean, including the edge of sea ice, is required to understand the interactions between the Southern Ocean and the Antarctic ice sheet, and the developments of the observation instruments are also important element to obtain the data.

The underwater robots such as ROV (Remotely Operated Vehicle) and AUV (Autonomous Underwater Vehicle) are widely used in the oceanographic observation in recent years associated with the development of robotics. Introduction of unmanned research vehicles, such as ROV, AUV and USV (Unmanned Surface Vehicle), is urged to obtain the oceanographic and geological observation data around unexplored field, under ice shelf, sea ice and the surrounding areas, and the observation instruments accompanied with the unmanned research vehicles must be developed. The outline of the introduction of unmanned research vehicles and the development of the observation instruments around the boundary between ice sheet and ocean, including the edge of sea ice, is presented, and the future perspective is discussed.

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