Observational plans of the South Sandwich Arc by R/V Hakuho Maru: Toward understanding formation and evolution of the world southernmost arc-trench system

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The South Sandwich arc-trench system, located in between South America and Antarctica, is one of the unexplored subduction zones of the world. It was originated in Mesozoic fragmentation of Gondwana, and Neogene westward subduction of South American plate causes formation of South Sandwich volcanic arc and back-arc opening of West and East Scotia Sea. The formation of Scotia Sea is closely related to the opening of Drake Passage Gateway, and thus it caused the development of the Antarctic Circumpolar Current and affected the earth’ s climate. However, detail back-arc opening process of Scotia Sea is poorly understood. Sediment accumulated in the South Sandwich Trench is expected to contain large amount of diatom and IRD (ice-rafted debris), but the nature of the sediment in the trench is unknown because of the lack of sediment cores.
On 2019 December-2020 January, R/V Hakuho Maru will visit the South Sandwich Arc and Weddell Sea as a part of around the world cruise for her 30th anniversary. During this cruise, we plan to take 1) dredge samples of forearc high of South Sandwich Arc possibly recording initiation process of oceanic island arc, as well as 2) sediment cores in South Sandwich Trench as an input to a subduction zone in polar region. By comparing the findings during this cruise to accumulated knowledge on backarc-arc-trench system around Japan, we try to understand the formation and evolution of the world southernmost arc-trench system.

