



Key words: South West Indian Ocean, Trace Element and nutrient cycle, isotopes, biogeochemistry, GEOTRACES.

SWINGS is a multidisciplinary 4-year project fully dedicated to elucidate trace element sources, transformations and sinks along a section crossing key areas of the Southern Ocean (SO). SWINGS aims at 1) establishing the relative importance of sedimentary, atmospheric and hydrothermal sources of trace elements and isotopes (TEIs) in the Indian sector of the SO, 2) investigating the drivers of the internal trace element cycles: biogenic uptake, remineralization, particle fate, and export, and 3) quantifying TEI transport by the Antarctic Circumpolar Current and the complex frontal areas at the confluence between Indian and Atlantic Oceans. SWINGS will address the following 3 primary questions:

1. How is the relative importance of sedimentary, atmospheric and hydrothermal sources of TEI in the Indian sector of the SO?
2. What are the drivers of internal TEI cycles: biological uptake, remineralization, particle fate and export?
3. Can we quantify TEI transport by the Antarctic Circumpolar Current and the complex frontal areas at the confluence between Indian and Atlantic Ocean?

The SWINGS cruise will start from Durban (ZA) on January 10th, 2021 and end at La Réunion (Fr) on March 8th, 2021. Track and sampling strategy are schematically represented below.

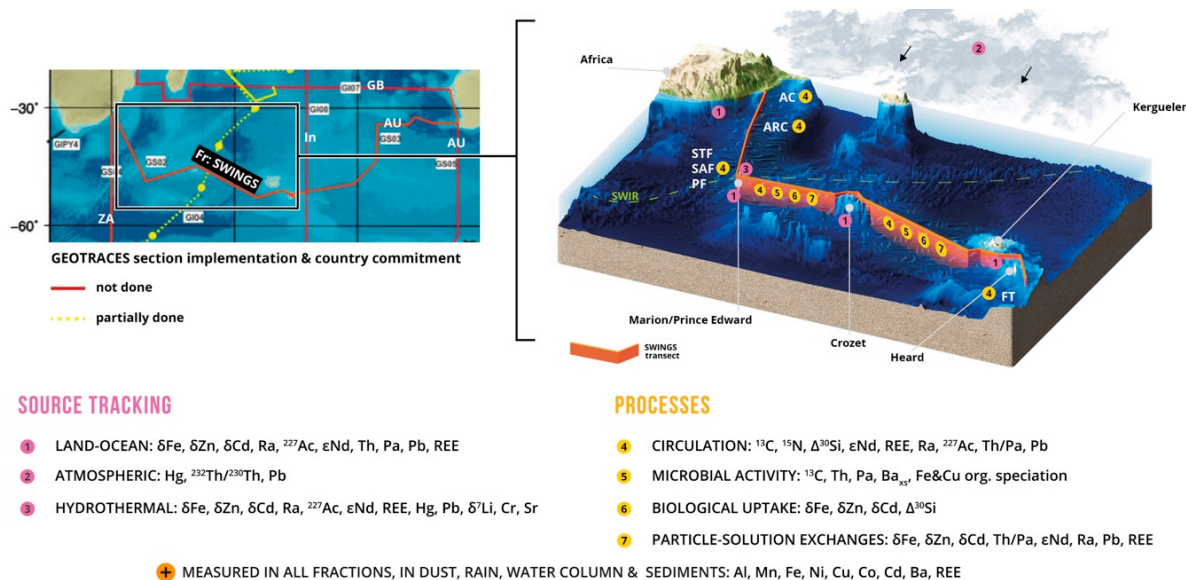


Figure 1: Left: The GEOTRACES implementation map illustrates the extremely poor coverage of the SO yet, underlining the Fr-SWINGS (GS02 section) commitment. Right: view of the SWINGS section with indicative front positions and current directions (AC&ARC: Agulhas Current & Agulhas Return Currents, STF&SAF: Sub Tropical & Sub Antarctic Fronts, PF: Polar Front, FT: Fawn Trough. External source tracking and processes with corresponding tracers to be analyzed during SWINGS: 1, Land-ocean; 2, atmospheric; 3, hydrothermal; 4, circulation transports; 5, microbial activity; 6, biological uptake; 7, particle-solution exchanges.