Iodine isotopes (^{129}I and ^{127}I) and species (I^- and IO_3^-) as ultra sensitive tracers of ocean circulation

The objective of this project is to establish data sets for the radioactive isotope ^{129}I and stable isotope ^{127}I as well as their speciation in seawater along a transect across the Atlantic Ocean and into the Ross Sea (Antarctica) which can serve as:

1) Basic information (temporal and spatial) about pattern, sources and processes of water mass exchange roots and rates between the North and South Atlantic Oceans.
2) First data set on the distribution of iodine isotopes and their speciation in the waters of the Southern Ocean, particularly the along the cruise track which cross the convergence zone, the marginal ice and the Ross Sea.
3) A tool for estimating magnitude of the different vertical water parcels dominance that will eventually contribute to improve predictions of ocean circulation in this region of the world.
4) Revealing dominant chemical speciation of ^{129}I in ocean water and bioavailability for ecological loading. Iodine resides in different speciation forms within the water mass and in the organic and inorganic molecules and will strongly be affected by the redox potential of the water parcels.
5) First time series that will elucidate preservation, dissipation and cycling of radioactive ^{129}I within the Atlantic Ocean and into the Southern Ocean.

We are not yet have the exact information about Oden route along the North Atlantic and thus a few alternative options can be discussed during the meeting. One of the options is to sample parts of the Gulf Stream and its branches in the North Atlantic, otherwise, sampling the North Sea and Atlantic flow along the Equatorial region is another options. The transect is then extended into the Southern Atlantic along the deep southerly and the surface and deep currents. Finally, we shall collect samples along the primary cruise track from Punta Arenas to McMurdo Sound.

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