Title: Oceanic circulation at seamounts from observational data and comparison with theory

Short description:

Seamounts are common and prominent features of the world's underwater topography, and are known to influence the deep ocean circulation. Their abrupt topography may perturb large-scale oceanic flows by generating Taylor caps, rectified flows, upwelling along the flanks and internal tides. Most of this knowledge comes from idealized numerical simulations or limited in-situ data. We propose in this thesis project to compare in-situ data collected during a cruise in summer 2025 along a seamount chain with theoretical knowledge about seamount circulation. Data include 27 CTD/Lowered-ADCP profiles, two 21-day-lasting mooring equipped with up- and downward looking ADCPs (+6 Aquadopps for one mooring) and two shipborne ADCPs, that can be used to characterize the stratification and the current flow field around seamounts. The use of the recently launched altimetry satellite SWOT is also possible, as well as outputs from a realistic numerical simulation of the area, to complete analyses.

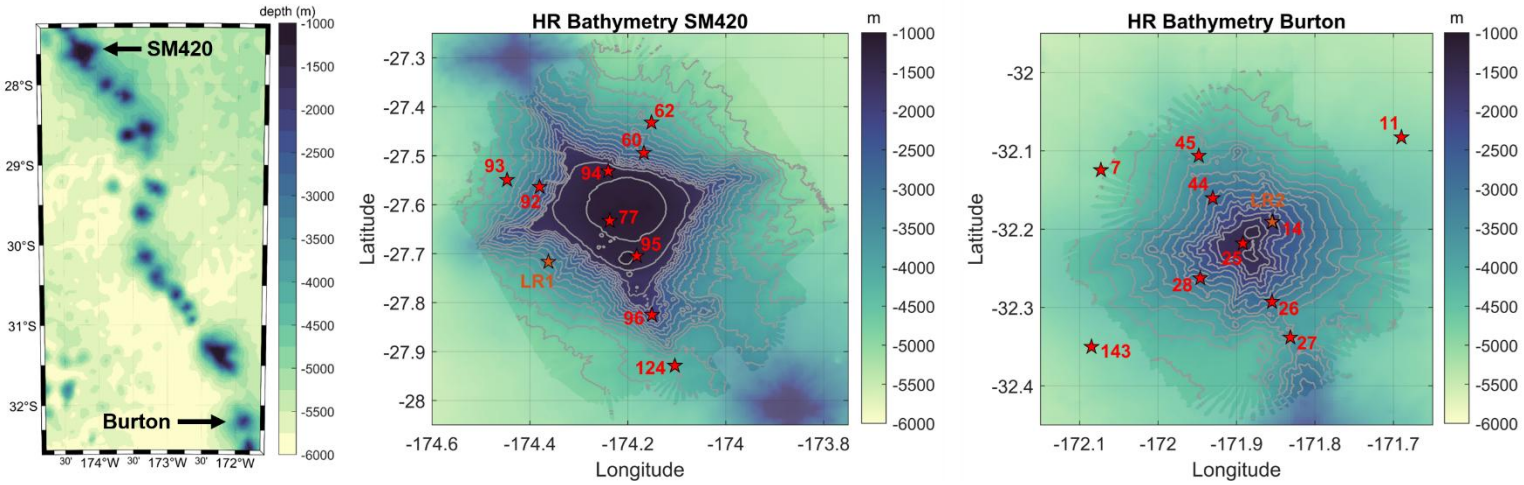

Fig. 1: Bathymetry of the Louisville Ridge seamount chain sampled during the cruise (left). Bathymetry of the seamounts 420 (center) and Burton (right). CTD/LADCP stations are indicated in red. Mooring locations are indicated in orange.

Skills needed:

Good programming skills in Matlab or Python, interest in working with observational data. Experience in working with in-situ data is an advantage.

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