IV ROSS SEA CONFERENCE 2023

Università degli Studi di Napoli "Parthenope"
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Topic: Ocean-ice-atmosphere interactions

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ABSTRACT Subject :

Water masses beneath the Ross Ice Shelf

Abstract 13/02/2023 21:18:01

In December 2022, an ocean glider made an unauthorised foray beneath the Ross Ice Shelf, surveying the upper 200 m of the water column in high resolution beneath an ice shelf base at about 80 m. 12 dives were obtained beneath the sea ice adjacent to the ice shelf, followed by 64 dives beneath the ice shelf, followed by 4 further dives beneath the sea ice; these provide a fascinating comparison of the two under-ice environments. Each dive yields two profiles, from the descent and the ascent, sampling right up to the ice base, revealing details of the boundary layer beneath the ice. The glider carried sensors measuring temperature, salinity, dissolved oxygen, chlorophyll fluorescence and optical backscatter. We observe solar-warmed water penetrating beneath the ice shelf with elevated chlorophyll fluorescence, optical backscatter and oxygen, and low salinity. We explore mechanisms for the advection of this water beneath the ice shelf. Also beneath the ice shelf we observe water colder than the surface freezing point, lower in oxygen, higher salinities and no chlorophyll, likely to contain ice shelf meltwater. Here we discuss these water masses and the processes that these observations reveal.