



# 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 :**

Observations of baroclinity at grounding lines with and without subglacial discharge: The Kamb Ice Stream

**Abstract** 27/01/2023 00:29:16

Antarctic grounding zones are a critical but poorly understood environment, hosting ice-ocean-seafloor interactions that have implications for global ocean circulation and sea level rise over the coming century and beyond. The region is where the polar ice sheets first leave continental bedrock to float over the ocean, encountering the heat content of the ocean. Due to the extreme difficulty of direct access, grounding zone environments have been sampled only a handful of times, and then usually only to obtain a brief snapshot of data. Here we present recent ocean profile and timeseries data from two locations at the Kamb Ice Stream (KIS) grounding zone of the Ross Ice Shelf. One location (KIS1) is a few km from the actual grounding line with a 30m water column beneath 600 m of ice and snow. The ocean observations reveal significant two-layer stratified flow behaviour clearly modulated by tidal processes. The second site (KIS2) is a channel incised into the base of the ice sheet, upstream of what would be considered the grounding line, and is dominated by a modest subglacial discharge. The resulting water column is around 250 m high but only 150 m wide and stratified into several distinct layers. These unique data provide new understanding of how heat is delivered to the ice base as the resultant melting within the grounding zone drives cavity-scale density-driven overturning and sets up basal boundary conditions across the entire cavity.

