IV ROSS SEA CONFERENCE 2023

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PHYSICAL OCEANOGRAPHY

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ABSTRACT Subject :

Current observations in the Ross Sea

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The Ross Sea is a crucial region of the Earth's Climate. Approximately 25% of Antarctic Bottom Water (AABW) originates from the Dense Shelf Water (DSW) produced on its continental shelf. Changes in AABW properties and formation rate propagate into the global ocean and affect stratification, sea level, heat content, and the carbon cycle. Understanding the long-term variability of the Ross Sea DSW physical properties and its controlling factors is critical to assessing the AABW variability. The Italian Marine Observatory in the Ross Sea (MORSea) project, funded by the Italian National Program of Research in Antarctica (PNRA), has a network of moorings in crucial areas of the Ross Sea, collecting multi-decadal physical observations, Since 1995. Many studies have analyzed the DSW properties changes of the Ross Sea, but few have focused on continental shelf circulation. Here using mooring and LADCP data we present a study on the Ross Sea circulation and its role in the dense water formation. In particular, we analyzed the circulation in Terra Nova Bay where the saltiest AABW precursor is formed and then compared the current-meter time-series of the mooring situated in the polynya with the other MORSea moorings located close to the shelf break in the western and central Ross Sea. Recent studies have suggested that the tides are the dominant source of currents in the Ross Sea, and have a central role in shaping the AABW outflow, therefore we have performed and compared spectral and tidal analyses of the current measurements registered on those moorings.

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