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Intrusion of Circumpolar Deep Water over the continental shelf in the central Amundsen Sea

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The Amundsen Sea sector is the most rapidly changing region of the Antarctic ice sheets. It has been claimed that the rapid retreat of the glaciers (or ice sheets) is primarily related to the intrusion of warm Circumpolar Deep Water (CDW) which acts as an oceanic heat source. The Amundsen shelf troughs were suspected to be main conduits supplying warm CDW onto the continental shelf, eroding the underside of the ice sheets and glaciers.
Despite the critical role of CDW in the continental shelf of the Amundsen Sea, vital information is still lacking concerning the spatial-temporal variability of CDW. This is mainly because the Amundsen Sea is remotely located and the harsh weather and sea conditions limit the access to its inner shelf. This pronounced lack of data hinders the evaluation and prediction of physical processes and associated biogeochemical processes in the Amundsen Sea.
Using the icebreaker R/V Araon, three institutes (KOPRI, UGOT and BAS) launched a resource-sharing program for monitoring the distribution of CDW and associated rapid melting of glaciers in the Amundsen Shelf. During the 2012 Amundsen Sea cruise, 52 CTD stations were visited, and a total of 6 moorings were successfully recovered and 15 moorings were newly deployed at the shelf break, troughs and ice shelf front. During the presentation, preliminary data and results archived during the 2012 Araon cruise will be presented in terms of CDW intrusion and its synoptic circulation on the Amundsen shelf. The mechanism of external forcings (e.g., wind) controlling the inflow or outflow of CDW will be also discussed.

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Seasonal variations in terminus position of outlet glaciers in Greenland: insights from 10 years of near-daily remote sensing observations

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Many of Greenland's marine-terminating outlet glaciers have undergone rapid retreat in the last decade, accompanied by accelerated flow speeds and dynamic thinning. Superimposed on this secular pattern of retreat, these glaciers undergo seasonal variations in terminus position, corresponding