Characteristics of H-O isotopes in water masses and implication for spatial variations of freshwater in Amundsen Sea, West Antarctic

HEBIN SHAO[1], JIANFENG HE[1], GUANGFU LUO[1], SHUNAN CAO[1], MUSHENG LAN[1]

[1]MNR Key Laboratory for Polar Science, Polar Research Institute of China, Shanghai, 200136, China (*correspondence: shaohebin@pric.org.cn)

We analyzed the H and O isotopic compositions of 301 seawater samples collected during the 34th Chinese Research Expedition of Antarctic in 2017. The main objectives are to: 1) identify the nature of H-O isotopes of water masses in Amundsen sea, West Antarctic; 2) combine the conductivity-temperature-depth (CTD) data and H-O isotopic data to address the water masses structure and distribution of freshwater in this area.

A hydrographic survey in Amundsen sea showed a melt-laden outflow from the continent to South Ocean. The waters in the survey region can be divided into surface (~100 m depth), subsurface (~100-400 m depth) and deep waters (>400 m depth) by temperature and salinity. Ice shelves melting provides large amount of fresh water into the surface water, and decreasing with depth. The freshwater (sea ice and ice shelf melting) might reach to the 63°S. While the fresh water distribution along the heavy sea ice boundary shows the west higher than the east regions. The meteoric water (MW) northward transporting is not continuous but interrupted by oceanic waters, possibly resulting from wind-driven gyres.