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^{230}Th-normalized flux of biogenic components recorded in the Chilean margin since the last glaciation.

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During the last glacial maximum (LGM), the atmospheric partial pressure of CO_2 ($_pCO_{2atm}$) was quite low, 180-190 ppm and rapidly increased to 280 ppm during the last deglacation (Monnnin et al., 2001, Science, 291, 112-114). The combination of the biogeochemical (e.g. export flux, nutrient utilization) and physical processes (e.g. upwelling, stratification) has been considered to control $_pCO_{2atm}$. Considering the response of $_pCO_{2atm}$ on global climate changes, the polar ocean such as Southern Ocean is one of the most important area linking between atmosphere and ocean, because the deepest water mass can directly connects to the atmosphere and the largest carbon reservoir in the world oceans. During glacial periods, strengthened productivity and an efficient biological pump in the North Pacific, equatorial Pacific, and Southern Oceans may have contributed to low $_pCO_{2atm}$. However, there is still some controversy as to whether marine productivity was high everywhere during glacial periods. Resolving this controversy requires more data from many regions regarding temporal changes in past export fluxes of biogenic materials, especially in the eastern South Pacific Ocean including the Chilean marginal region, where active biological production is observed at present. The aim of this study was to identify changes in the ^{230}Th-normalized export flux of biogenic components commonly used as proxies for paleoproductivity-namely total organic carbon (TOC), total nitrogen (TN) and biogenic opal (Si_{opal}) from two sediment cores collected at 36 ^{o} S, off central-south Chilean covering the past 22 kyr (PC-1) and at 52 ^{o} S near the mouth of Strait of Magellan, Pacific side over the past 13 kyr (PC-3). ^{230}Th-normalized fluxes of biogenic components of sediments at 36 ^{o} S and 52 ^{o} S off the Chilean coast imply that the biological pump was effective during 14-8 kyr BP off central Chile, and after 5 kyr BP off central and southernmost Chile; and less effective during 22-14 kyr BP off central Chile and during 13-6 kyr BP off southernmost Patagonia. That is to say, off central Chile, the weakness of the biological pump during the LGM contributed to the global rise of $_pCO_{2atm}$ at that time. During 14-8 kyr BP, the increasing effectiveness of the biological pump at the PC-1 site off central Chile contributed to the global rise of $_pCO_{2atm}$. At the PC-3 site, the weakening of biological pump contributed to the rise of $_pCO_{2atm}$ during 13-6 kyr BP. After 6 kyr BP, the active biological pump did not contribute to the global rise of $_pCO_{2atm}$.

In this presentation, we will also discuss about comparing to ^{230}Th-normalized fluxes of biogenic components at the 55 ^{o} S collected from the Drake Passage (PC-9).

Keywords: Off Chile, 230-Thorium, Biogenic components, Biological pump