

LONG-TERM VARIABILITY OF SEA-ICE / ICE-SHEET ALBEDO AND ITS RELATIONSHIP WITH CLIMATIC VARIABLES OVER ANTARCTICA

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ABSTRACT... Antarctica is important area of global climate change. Recent researches indicate the regional paradox of Antarctic climate variables. However, in situ data has not a dense distribution over Antarctica for understating the paradox of the area. Therefore, satellite observation data is easy to know the long-term variation over Antarctica, because the data obtain periodically a wide area. In addition, albedo is key parameter for understanding the energy budget and climate change of Cryosphere such as South Pole, due to it mainly covered by ice and snow with high albedo value. In this study, our purpose is to analyze that long-term variation to albedo sea ice and ice sheet, also investigate the correlation between albedo and climatic factors for understanding that climate and environmental changes over Antarctica. We used broadband surface albedo data by Satellite Application Facility on Climate Monitoring (CM SAF) and several climatic variables data such as temperature, Antarctic oscillation and sea ice concentration during 1983 to 2009. Time series analysis and correlation analysis were performed through liner regression and harmonic analysis using albedo and climatic variables. Results of this research, albedo has two trend each trend ocean and continent over the Antarctica. Most of the western side has negative trend of albedo (about $-0.07 \sim -0.15$ % yr-1) and the other side has positive trend of albedo (about 0.06 % yr-1) over Antarctica. In addition, Weddell sea and Ross sea section has positive trend of albedo (about $0.04 \sim 0.26$ % yr-1) and Bellingshausen Amundsen sea has negative trend (about $-0.14 \sim -0.25$ % yr-1).

KEY WORDS: Antarctica, Albedo, Cryosphere