[EJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS06]Global climate change driven by the Southern Ocean and the Antarctic Ice Sheet

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The Southern Ocean and Antarctic ice sheet, which are the giant reservoirs of heat, water, and materials, have a potential to play central roles in long-term global climate change. This system is composed of the following sub-systems; ice shelf which is a place of the interaction of ice sheet and ocean, flowing iceberg, seasonal sea ice zone, Antarctic bottom water which drives the thermohaline circulation, active biological production and Antarctic Circumpolar Current. These sub-systems are interacted with each other and have significant impact on changes in the global environmental system. This session aim to summarize recent observational and simulation studies from various fields relating to the past and present changes in the Antarctic Ice sheet and Southern Ocean, which are essential elements for unraveling the changes in the global climate system. Further, future science plans for understanding of the environmental changes of the Antarctic Cryosphere is also discussed.

[MIS06-P09]Bipolar-seesaw oscillations and deglaciation with MIROC AOGCM

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During the last termination of ice age cycle (deglaciation), Heinrich event 1 as well as B/A, Antarctic Cold Reversal (ACR) and Younger Dryas occurred as millennial scale climate changes. Here we ran several deglaciation experiments as well as sensitivity experiments using a coupled atmosphere and ocean GCM (MIROC4m AOGCM) developed in Japan and analyzed the stability of AMOC and climate. The model was also run for 10000 years under many different conditions with constant Greenhouse Gas levels with glacial ice sheet and with and without freshwater flux into North Atlantic region. The results show large oscillation of AMOC and high latitude temperature change similar to B/A and D-O cycles, comparable with ice core data and deep-sea data for some cases. We show that the D-O like oscillation and B/A type change occur under limited range of CO2 and freshwater forcing. The conventional hysteresis curve of stability diagram of AMOC is also analyzed by changing gradually the freshwater flux in the North Atlantic. Implication on the mechanism of the millennial scale climate changes is discussed.