Singals of climate changes in an ice-core obtained from Mount Ichinsky, Kamchatka

Sumito Matoba[1]; Takayuki Shiraiwa[2]

[1] P-ORC, ILTS, Hokkaido Univ; [2] RIHN

An ice-core was obtained from Mount Ichinsky, Kamchatka, Russia We obtained a 115-m deep ice core from the summit glacier of Mount Ichinsky, Kamchatka, Russia in 2006. Chemical analysis and stratigraphical observation was carried out from surface to 48-m deep. Structure of the ice-core was constructed by firn layers which was not influenced by melt water, and ice layers which was formed by melt water or rain. The ice-core is briefly *wet* ice-core. Generally, when we analyze *wet* ice-cores, perturbation of chemical signals generated by melt water is concerned. Concentrations of chemical species in ice layers were comparable to that in firn layers. Therefore, we suggest that run off of chemical species from glacier is negligible. Variation of concentrations of nitrate and sulfate correlated better in ice layers than in firn layers. Because the source of nitrate is different from that of sulfate, variations of nitrate and sulfate should not be correlated. It seems that good correlation of nitrate and sulfate in ice layers result from migration and relocation of them within the glacier generated by melt water wash out from snow layer where they were contained initially. Consequently, we suggest that it is difficult to extract signals in detail, but possible in long term from the ice-core.

The age of the ice-core was estimated by peak counting of hydrogen stable isotope ratio , and comparison of volcanic signals with an ice-core obtained from Mount Ushkovsky, Kamchatka in 1998.

The structure of the ice-core from 30 to 48-m deep consists of ice layers, and shows that snow melting in summer was significant from 1960s to middle of 1970s. The 30-m deep approximately corresponds to regime shift, when PDO index increased suddenly in 1977. The features of negative PDO index are low air temperature in Alaskan side and high in Kamchatka side, supports the change of temperature obtained from the ice-core analysis.

The values of negative peak of hydrogen stable isotope ratio were high and concentrations of sodium ion as an indicator of sea salt were low from mid-1980s to mid 1990s. During the period, AO index of winter (DJF) was high. The features of high AO index period is generally warm winter and relatively week westerly wind, and agree with the profiles of hydrogen isotope ratio and concentration of sodium in the ice-core.