

# Proceedings of the NIPR Symposium

on

## Polar Meteorology and Glaciology

No. 8

Papers presented at the "16th Symposium on Polar Meteorology and Glaciology" held at the National Institute of Polar Research, Tokyo, August 4–5, 1993

### CONTENTS

A qualitative assessment of height dependent interannual variability of polar stratospheric ozone. Part 1: Long-term variability and stratospheric ozone depletion ... <i>Hartwig GERNANDT, Klaus DETHLOFF and Hiroshi KANZAWA</i> ...	1
Relationship between atmospheric CO <sub>2</sub> and CH <sub>4</sub> concentrations at Syowa Station, Antarctica .... <i>Shuhji AOKI, Takakiyo NAKAZAWA, Shohei MURAYAMA, Akira SHIMIZU, Masahiko HAYASHI and Kunimoto IWAI</i> ...	14
Aerosol optical depth observations by JARE-33 and JARE-34 in 1991 and 1992 ... <i>Susumu KANETO, Takayuki KISHI and Meteorological Staff of 33rd and 34th Japanese Antarctic Research Expeditions</i> ...	19
Transport of Pinatubo aerosols to the Arctic region: Lidar measurements at Alaska, winter 1991/1992 ..... <i>Yasu-nobu IWASAKA, Masahiko HAYASHI, Takashi SHIBATA, Katsuji MATSUNAGA, Masahiro NAGATANI, Hiroshi NAKADA, Ikuko MORI, Tetsuro OJIO, Motoo FUJIWARA, Eiji AKIYOSHI, Satoshi YASUMATU, Koji YAMAZAKI, Kouji KONDOH and Hideaki NAKANE</i> ...	27
Tropical influence on the South Pacific double jet variability ..... <i>Akio KITO</i> ...	34
Wind variation features of Syowa and Asuka Stations, East Antarctica <i>Susumu KANETO, Hiroshi IGARASHI and Kazumasa MATSUHARA</i> ...	46
The relationship between the thermal belt on the slope of the ice sheet on the Sôya Coast and the surface inversion layer over Syowa Station ..... <i>Kiyotaka NAKAGAWA and Hiroko SHIMODOORI</i> ...	53
Micrometeorological observation over the fast ice at Ongul Strait near Syowa Station ..... <i>Kiyotaka NAKAGAWA</i> ...	66

The influences of the sea ice and the wind field on the winter air temperature variation in Hokkaido <i>Meiji HONDA, Yoshihiro TACHIBANA and Masaaki WAKATSUCHI...</i>	81
Interaction between Antarctic sea ice and ENSO events ..... <i>Simei XIE, Chenglan BAO, Zhenhe XUE, Lin ZHANG and Chunjiang HAO...</i>	95
Study on the oscillation relationship between sea ice of the Arctic and Antarctic ..... <i>Simei XIE, Chenglan BAO and Chunjiang HAO...</i>	111
Determination of polycyclic aromatic hydrocarbons in the ice core samples from Greenland ..... <i>Kimitaka KAWAMURA, Ikuko SUZUKI, Yoshiyuki FUJII and Okitsugu WATANABE...</i>	129
Growth process of air-hydrates and diffusion of air molecules in deep ice sheet ..... <i>Tsutomu UCHIDA, Shinji MAE, Takeo HONDOH, Vladimir Ya. LIPENKOV, Paul DUVAL and Jun-ichi KAWABATA...</i>	140
Using a mobile radio echo sounder to measure bedrock topography in East Queen Maud Land, Antarctica ..... <i>Hideo MAENO, Kokichi KAMIYAMA, Teruo FURUKAWA, Okitsugu WATANABE, Renji NARUSE, Ken'ichi OKAMOTO, Takeshi SUITZ and Seiho URATSUKA...</i>	149
A technique of continuous analysis of sea ice distribution using video images taken from a ship ..... <i>Ken'ichiro MURAMOTO, Kohki MATSUURA, and Tatsuo ENDOH...</i>	161
A method to analyze the meteorological radar echo observed at Syowa Station, Antarctica <i>Hiroshi TAKEYA, Masahiko HATANAKA, Takeshi SAKAGUCHI, Akira NISHITSUJI, Mitsuo HOSHIYAMA and Makoto WADA...</i>	169
Ground based measurements of column amounts of NO <sub>2</sub> over Syowa Station, Antarctica (abstract) ..... <i>Yutaka KONDO, W. A. MATTHEWS, Makoto KOIKE, Hideaki NAKAJIMA, Kenta TSUKUI, Masahiko HAYASHI, Takashi YAMANOUCHI, Shuhji AOKI and Kunitomo IWAI...</i>	178
Seasonal variation of low molecular weight dicarboxylic acids in the Arctic atmosphere (abstract) ..... <i>Hideki KASUKABE, Kimitaka KAWAMURA and Leonard A. BARRIE...</i>	179
Infrared absorption measurement of HCl, HF, and N <sub>2</sub> O at Syowa Station (abstract) ..... <i>Isao MURATA, Kazuyuki KITA, Naomoto IWAGAMI and Toshihiro OGAWA...</i>	180

Atmospheric distributions and changing trends of CFCs and halons in the Northern and Southern Hemispheres (abstract)	
..... <i>Yoshihiro MAKIDE and Takeshi TOMINAGA</i> ...	181
Snow particle size distribution function at Syowa Station evaluated from VTR image (abstract)	
... <i>Masahiko HATANAKA, Yoshiyuki OHTA, Hiroshi TAKEYA, Akira NISHITSUJI and Makoto WADA</i> ...	182
Formation of side branches of dendritic ice crystals growing from the vapor phase (abstract)	
..... <i>Takehiko GONDA and Makoto WADA</i> ...	183
Influence of the polar air mass on the weather in northern Japan (abstract)	
..... <i>Kunio RIKIISHI, Ryota AOKI and Shingo MIYAHATA</i> ...	184
Variations of atmospheric CO <sub>2</sub> concentration over Syowa Station, Antarctica and air transport process (abstract)	
<i>Shohei MURAYAMA, Takakiyo NAKAZAWA, Koji YAMAZAKI, Shuhji AOKI, Yukio MAKINO, Masataka SHIOBARA, Masashi FUKABORI, Takashi YAMANOUCI, Akira SHIMIZU, Masahiko HAYASHI, Sadao KAWAGUCHI and Masayuki TANAKA</i> ...	185
Growth process of ice crystals from frozen water droplets (abstract)	
..... <i>Chuji TAKAHASHI and Masaru MORI</i> ...	186
Radiation budget in the Antarctic from satellite and ground-based observations (abstract)	
..... <i>Takashi YAMANOUCI</i> ...	187
A comparison of observation with modeling for albedo and transmittance of snow (abstract)	
..... <i>Teruo AOKI, Katsumoto SEKO, Tadao AOKI and Masashi FUKABORI</i> ...	188
On the late occurrence of drift ice retreat from the Hokkaido coast in the 1992/93 sea ice season (abstract)	
..... <i>Takenobu TOYOTA and Etsuro KAMIHIRA</i> ...	189
Water structures in Kongsfjorden, Spitsbergen in 1991–1993 (abstract)	
..... <i>Shuki USHIO, Sakae KUDOH, Hajime ITO and Nobuo ONO</i> ...	190
Sea-ice formation and water structures in coastal polynyas off Lützow-Holm Bay and Breid Bay (abstract)	
..... <i>Shuki USHIO, Takatoshi TAKIZAWA, Kay I. OHSHIMA and Toshiyuki KAWAMURA</i> ...	191
Seasonal variations of the Antarctic coastal ocean in and off Lützow-Holm Bay (abstract)	
..... <i>Kay I. OHSHIMA, Takatoshi TAKIZAWA, Toshiyuki KAWAMURA and Shuki USHIO</i> ...	192

Variabilities of currents under fast ice in Lützow-Holm Bay, Antarctica—Comparison between observations and model— (abstract)	
..... Kay I. OHSHIMA, Toshiyuki KAWAMURA, Takatoshi TAKIZAWA and Shuki USHIO...	193
Growth processes of sea ice in Ongul Strait (abstract)	
..... Toshiyuki KAWAMURA, Kay I. OHSHIMA, Shuki USHIO and Takatoshi TAKIZAWA...	194
Sea ice in Lützow-Holm Bay(II)—Its structure and growth processes— (abstract)	
..... Toshiyuki KAWAMURA, Kay I. OHSHIMA, Shuki USHIO and Takatoshi TAKIZAWA...	195
A fundamental experiment on detection of sea ice thickness by UHF waves (abstract)	
..... Hayao TAKASHIMA and Hisao YAMAKOSHI...	196
Relation between the SSM/I brightness temperature and direction of the maximum surface slope in East Queen Maud Land, Antarctica (abstract)	
..... Shuji FUJITA, Ayako SATO and Shinji MAE...	197
Background levels of $\text{HCOO}^-$ , $\text{CH}_3\text{SO}_3^-$ , $\text{NO}_3^-$ , $\text{SO}_4^{2-}$ and $\text{NH}_4^+$ in ice cores from inland Greenland (abstract)	
..... Kazuo OSADA and Chester C. LANGWAY, Jr....	198
Dynamical behavior of Shirase Glacier in relation to deterioration of the shelf ice (abstract)	
..... Masayoshi NAKAWO and Shin'ichi KAWAI...	199
Dielectric properties of ice at 5.1 and 9.7 GHz using cavity resonator (abstract)	
.... Takeshi MATSUOKA, Shuji FUJITA, Shigenori MORISHIMA and Shinji MAE...	200
Precise measurements of dielectric anisotropy in ice Ih at 35 GHz using an open microwave resonator (abstract)	
.... Shigenori MORISHIMA, Shuji FUJITA, Takeshi MATSUOKA and Shinji MAE...	201
SEM observations of volcanic ash at 500 m depth in the Mizuho ice core (abstract)	
..... Akira HIGASHI, Yoshiyuki FUJII and Satoshi TAKEYA...	202
Identification of annual layers by chemical analyses with a 10 m DC core (abstract)	
.... Kazuki NAKAMURA, Yutaka AGETA, Masayoshi NAKAWO and Kumiko GOTO-AZUMA...	203
The relation between chemical compositions of snow and atmospheric aerosols in Antarctica (abstract)	
..... Satoru KANAMORI, Nobuko KANAMORI, Okitsugu WATANABE, Hideaki MOTOYAMA and Kenji YOSHIKAWA...	204

Bubble volumes in firn-ice transition layer of ice cores from polar ice sheets (abstract)	
..... <i>Takao KAMEDA and Renji NARUSE</i> ...	205
Snow accumulation rate at Snøfjellaafonna, northwestern Spitsbergen, Svalbard (abstract)	
..... <i>Takao KAMEDA, Shuhei TAKAHASHI, Kaoru IZUMI, Kumiko GOTO-AZUMA, Shiro KOHSHIMA, Okitsugu WATANABE and Jon Ove HAGEN</i> ...	206
Measurement of diffusion coefficients of gas molecules in ice (abstract)	
..... <i>Kouichi SATOH, Tsutomu UCHIDA, Takeo HONDOH and Shinji MAE</i> ...	207
Development of a computer simulation scheme for two and three dimensional ice sheet dynamics models (abstract)	
..... <i>Shinichi KAWAI and Masayoshi NAKAWO</i> ...	208
Program of the 16th Symposium on Polar Meteorology and Glaciology held at the National Institute of Polar Research, Tokyo, August 4–5, 1993	
.....	209
Author index .....	214