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CHINARE DATA REPORT

NO. 7

(METEOROLOGY 6)

Surface Meteorological Data at Zhong Shan Station,
Antarctica 1989-1992

Compiled by

Bian Lingen Xue Zhengfu Lu Longhua Lu Changgui

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POLAR RESEARCH INSTITUTE OF CHINA

中国南极考察资料报告

总第七集

(气象-6)

中国南极中山站 1989-1992 年地面气象资料

国家南极考察委员会资助项目

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Surface Meteorological Data at Zhongshan Station, Antarctica 1989–1992

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1. Introduction

Zhongshan Station is located at $69^{\circ} 22' S$ and $76^{\circ} 22' E$, 14.9 m above the sea level. The international index number is 89573. The local mean time is 3 hours earlier than GMT. At present the correction value of the pressure above sea level at the station level is 2.2 hPa. The surface meteorological observations have been made continuously since March 1989.

The present report contains the surface meteorological data from March 1989 to December 1992 taken by the members of CHINARE(No.4-8): Jiang Dezhong, Lu Changgui, Qian Ping, Wang Xing, Xue Zhenghe, Bian Lingen, Zhang Yongping, Zhou Hongfei, Hu Shengli, Xue Zhengfu and Wei Xi.

2. Instruments and methods

The barometer, barograph, thermograph, hygrograph, thermometer and cup-anemometer have been used at the station. The auto-observational system including the sensors of vibrating cylinder, platinum resistance, and high polymer membrane capacitance(for measuring humidity) have been installed in February 1990. Surface synoptic data were obtained at 02, 08, 14 and 20 GMT.

(1) Wind direction and wind speed

The anemometer with a vane was installed at the height of 10 m above the surface. The winds can be observed as instantaneous and mean values. The measuring ranges of wind speed and direction are $0-70\text{m/s}$ and $0-360^{\circ}$ respectively, with the corresponding measuring accuracies 0.5m/s and $\pm 5^{\circ}$.

(2) Atmospheric pressure

The barometer, barograph and the sensors were set inside with the accuracy of $\pm 0.3\text{hPa}$. The measuring range is $850-1050\text{hPa}$.

(3) Air temperature and humidity

The thermometer, thermograph, hygrograph and sensors were placed inside the shelter at the height of 1.5 m above the surface. The accuracies of temperature and rela-

tive humidity are $\pm 0.1^{\circ}\text{C}$ and 5% respectively. The measuring ranges of temperature and relative humidity are $-50\text{--}40^{\circ}\text{C}$ and 0–100% respectively.

(4) Visibility, clouds and weather phenomena

Visibility, clouds, weather phenomena were observed visually according to the WMO standards.

3. Notations used in the tables

(1) Table 1

PST _m :	Monthly mean pressure at station level;
T:	Monthly mean air temperature;
T _{dm} :	Monthly mean dew-point temperature;
T _{mm} , T _{mn} :	Monthly mean maximum, minimum temperature;
T _{mx} , T _n :	Extreme of maximum, minimum temperature and date;
R _m :	Monthly mean precipitation;
V _m :	Monthly mean(scalar) of wind speed;
D _m :	Most frequent wind direction;
V _{mx} :	Monthly maximum wind speed, direction and date;
V _{nd} :	Monthly days of wind speed between 10–14.9 and ≥ 15.0 m / s;
S _m :	Monthly total of sunshine duration;
S _p :	Percentage of observed duration to possible duration of sunshine;
N _m :	Monthly mean of cloud amount;
DS:	Monthly days of blowing snow.

(2) Table 2

PST:	Daily mean pressure at station level for 6-hourly observations;
T _m :	Daily mean air temperature for 6-hourly observations;
T _{max} , T _{min} :	Daily maximum and minimum air temperature;
T _{dd} :	Daily mean dew-point temperature for 6-hourly observations;
R:	Daily amount of rainfall;
S:	Daily amount of sunshine duration;
N:	Daily mean of cloud amount for 6-hourly observations;
V _m :	Daily mean wind speed for average of hourly values;

V_x : Daily maximum wind speed and direction;

(3) Table 3

LT: Local mean time (60 ° W, LMT) in hours;

PST: pressure at station level in hPa;

T: Air temperature in °C;

T_d : Dew-point temperature in °C;

V: Wind speed (10-minute mean) in m / s;

D: Wind direction in 16 directions;

N: Total cloud cover (WMO code);

WW: present weather phenomena (WMO code);

Vis: Visibility in km;

$C_L C_M C_H$: Forms of low, middle and high clouds (WMO code);

Note: The missing data are indicated as 999 in the tables.

中国南极中山站 1989-1992 年地面气象资料

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中山站位于 $69^{\circ}22'S$, $76^{\circ}22'E$, 海拔高度 14.9 米, 国际区站号为 89573。当地时为 $60^{\circ}W$ 平均时, 比世界时早 3 小时, 本站气压的海平面气压订正值 2.2 百帕, 地面气象观测始于 1989 年 3 月。

本资料报告整编了中山站 1989 年 3 月-1992 年 12 月逐月、逐日和一天 8 次地面气象观测资料, 观测资料是由中国南极考察队(CHINARE)取得, 观测人员有姜德忠、逯昌贵、钱平、王星、薛正和、卞林根、张永萍、周鸿飞、胡胜利、薛正夫、魏禧等。

中山站气象观测使用的仪器有水银气压表、气压计、干湿球温度表、温度计、电接式风向风速仪和日照仪等。1990 年 2 月安装了气象要素自动观测系统, 其中包括颤动筒式气压传感器、铂电阻温度传感器、高分子薄膜电容湿度传感器和脉冲式风速传感器等。

水银气压表、气压计和气压传感器安装在室内, 气压测量范围为 850-1050hPa, 精度为 $\pm 0.3\text{hPa}$ 。风传感器安装在距地表 10 米高的测风塔上, 风向风速测量范围分别为 $0-360^{\circ}$ 和 $0-70$ 米/秒, 精度分别为 $\pm 0.5^{\circ}$ 和 0.5 米/秒。温度表、温度计和温湿传感器安置在距地表 1.5 米的百叶箱内。温度和相对湿度的测量范围分别为 $-50-40^{\circ}\text{C}$ 和 $0-100\%$, 精度分别为 $\pm 0.1^{\circ}\text{C}$ 和 5% 。日照仪和雨量筒安置观测场内, 距地表高度分别为 1.5 米和 0.7 米。日降水量为当地时 08—08 时的降水量。云、能见度和天气现象为目测项目。一天四次定时地面气象观测时间为 02、08、14、20GMT。气压、温度、湿度和风每天均有连续的记录资料。所有要素的观测均按照世界气象组织(WMO)的规范进行。

注: 表 1-3 中所用符号详见英文说明。

Surface Data at Zhongshan Station, 1989

Table 1. Monthly Summaries at Zhongshan Station, Antarctica in 1989

1989	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual mean
PST _m (hPa)			985.3	989.9	974.8	982.4	979.7	986.3	981.2	978.8	988.8	987.3	983.5
T(°C)			-10.5	-14.4	-18.6	-14.8	-16.4	-13.0	-10.6	-9.0	-7.4	1.3	-11.3
T _{dm} (°C)			-20.7	-25.7	-24.8	-20.3	-23.7	-19.7	-19.1	-15.4	-16.8	-6.1	-19.2
T _{mm} (°C)			-8.1	-12.4	-15.3	-11.4	-13.7	-8.6	-7.9	-6.1	-4.1	4.5	-8.3
T _{mx} (°C)			-2.1	-3.7	-5.1	-5.3	-5.1	0.9	0.9	-2.2	1.6	9.6	9.6##
(Date)			27	4	30	9	17	30	20	4	30	5	
T _{mo} (°C)			-12.2	-15.5	-22.2	-18.2	-19.2	-16.2	-13.2	-11.4	-10.2	-1.0	-13.9
T _n (°C)			-18.8	-24.3	-32.5	-31.1	-30.2	-33.6	-23.7	-20.1	-18.6	-3.0	-33.6##
(Date)			17	30	18	14	7	23	13	26	5	1	
V _m (m/s)			7.2	6.9	6.6	7.4	8.8	10.7	9.3	8.1	5.1	6.4	7.7
D _m			E	E	E	ESE	E	E	ESE	E	E	ENE	
V _{mx} (m/s)			33.9	22.7	33.2	41.7	40.5	39.0	43.6	32.6	23.2	34.6	43.6##
(Dir)			ENE	E	ESE	ESF	FSE	ESE	NE	ENE	ESE	ESE	NE##
(Date)			27	25	31	9	18	18	20	1	17	6	20
V _{nd}	[10-14.9]		9	11	8	5	5	3	8	4	18	9	80 *
	[>15.0]		18	15	17	18	22	26	18	23	9	18	184 *
S _m (h)			109.5	59.8	10.0	0.0	0.0	34.4	88.4	159.3	194.7	264.1	920.2 *
S _p (%)			28	24	11	0	0	17	27	34	31	36	21
N _m (1/10)			6.8	5.5	5.2	6.5	4.6	6.3	5.9	7.4	5.6	6.4	6.0
Snow(day)			18	9	17	19	9	16	12	18	10	15	143 *
DS(day)			3	0	6	8	6	8	2	5	1	0	39 *

##: Annual extremes *: Annual total

Table 2. Daily Summaries at Zhongshan Station, Antarctica in March 1989

Date	PST (hPa)	T _m (°C)	T _{max} (°C)	T _{min} (°C)	T _{dd} (°C)	S (h)	N (1 / 10)	V _m (m / s)	V _e (m / s)	
1	999	-9.7	-8.5	-10.7	-22.0	4.1	999	7.4	9.4	ESE
2	981.8	-10.1	-8.3	-11.1	-22.2	0.0	9.5	7.7	10.1	ESE
3	979.7	-11.5	-8.6	-14.0	20.1	11.3	5.5	2.8	4.4	S
4	979.7	-12.4	-10.3	-13.8	-18.0	0.0	8.8	2.4	3.2	W
5	985.3	-9.9	-7.3	-12.0	-18.9	4.3	6.8	4.7	12.1	ESE
6	986.2	-10.9	-7.4	-11.9	-22.9	2.6	4.8	9.3	13.1	ESE
7	994.2	-13.0	-10.0	-14.6	-26.5	12.7	4.5	8.6	12.2	ESE
8	986.9	-12.6	-10.0	-14.4	-26.0	11.8	4.3	7.8	12.7	E
9	975.9	-9.5	-7.3	-11.2	-18.3	0.0	8.0	7.5	9.0	ESE
10	969.8	-8.2	-6.7	-9.1	-18.6	0.0	6.8	10.8	15.0	ESE
Mean	982.2	-10.8	-8.4	-12.3	-21.4	4.7	6.5	6.9		
11	976.7	-10.3	-7.1	-11.6	-23.1	12.8	4.3	9.1	13.0	ESE
12	987.4	-8.0	-5.7	-10.2	-19.6	1.4	8.5	5.9	9.4	ESE
13	985.6	-6.1	-5.0	-7.3	-15.5	0.0	8.3	7.8	12.8	ESE
14	992.2	-8.1	-5.9	-9.1	-18.7	3.2	8.5	6.9	9.0	E
15	990.7	-12.2	-8.3	-13.4	-26.8	11.1	2.3	10.3	15.5	ESE
16	988.3	-16.0	-12.6	-17.7	-29.8	0.0	7.5	10.0	14.0	ESE
17	989.4	-16.9	-15.0	-18.8	-30.8	3.9	5.3	5.3	8.5	ESE
18	990.3	-15.7	-13.8	-17.5	-28.4	0.0	5.8	5.2	12.0	ESE
19	988.3	-14.3	-11.3	-11.8	-27.8	10.4	0.5	7.3	12.0	E
20	982.6	-14.2	-10.5	-15.9	-27.4	10.1	0.5	5.0	9.6	E
Mean	987.2	-12.2	-9.5	-13.3	-24.8	5.3	5.2	7.3		
21	986.9	-14.5	-12.4	-15.7	-24.8	0.0	7.5	3.7	6.4	ESE
22	984.0	-11.2	-6.9	-15.6	-21.3	0.0	8.8	7.7	12.3	ESE
23	975.6	-7.2	-6.0	-8.0	-13.8	0.0	10.0	6.3	11.6	ESE
24	982.0	-9.8	-7.9	-10.6	-17.1	1.5	10.0	4.5	6.7	E
25	987.0	-13.7	-10.5	-15.9	-21.4	0.0	9.8	5.7	8.9	ESE
26	990.3	-12.8	-8.5	-17.0	-19.6	0.0	9.8	4.7	13.6	ESE
27	979.8	-2.9	-2.1	-9.0	-7.0	0.0	10.0	16.0	24.5	ENE
28	992.3	-3.9	-2.6	-5.0	-6.0	0.0	10.0	9.4	18.4	NE
29	989.2	-5.2	-2.7	-7.5	-14.3	3.7	7.0	7.5	12.9	ENE
30	991.2	-6.2	-5.5	-8.0	-14.3	0.0	7.8	7.5	11.3	E
31	996.4	-8.3	-5.1	-9.3	-20.7	4.6	1.8	8.8	12.5	E
Mean	986.8	-8.7	-6.4	-11.1	-16.4	0.9	8.4	7.4		
Monthly Mean	985.3	-10.5	-8.1	-12.2	-20.7	3.5	6.8	7.2		

Table 2. Daily Summaries at Zhongshan Station, Antarctica in April 1989

Date	PST (hPa)	T _m (°C)	T _{max} (°C)	T _{min} (°C)	T _{dd} (°C)	S (h)	N (1 / 10)	V _m (m / s)	V _s (m / s)	
1	1003.2	-11.1	-9.0	-13.7	-25.0	7.4	0.8	7.8	10.7	ESE
2	996.7	-12.1	-10.6	-13.5	-25.0	6.8	0.3	7.7	11.5	E
3	985.2	-10.6	-8.5	-13.7	-23.6	5.2	2.5	9.5	11.9	E
4	976.5	-5.8	-3.7	-9.2	-18.4	0.0	6.0	9.5	14.4	ESE
5	992.4	-6.1	-3.7	-8.0	-11.1	0.0	10.0	7.1	13.0	E
6	997.2	-9.2	-7.4	-10.1	-18.9	0.0	10.0	7.3	10.2	ESE
7	995.4	-12.3	-9.6	-14.0	-24.5	0.0	9.0	7.4	10.6	ESE
8	998.8	-14.9	-12.8	-15.9	-27.8	5.8	3.3	8.8	12.7	E
9	996.6	-15.4	-13.0	-16.6	-26.2	0.0	3.8	7.6	15.5	ESE
10	995.6	-12.2	-10.8	-15.8	-21.2	0.0	8.8	5.7	11.9	ESE
Mean	993.8	-11.0	-8.9	-13.1	-22.2	2.5	5.5	7.8		
11	998.1	-11.3	-9.5	-12.0	-16.7	0.0	10.0	3.8	10.2	E
12	995.2	-11.5	-9.6	-12.5	-22.0	2.5	4.5	7.7	12.4	E
13	989.2	-13.8	-11.0	-15.3	-26.1	0.0	7.0	9.8	13.2	SE
14	985.3	-15.8	-13.8	-17.5	-26.7	0.0	7.8	5.1	9.3	ESE
15	991.6	-12.5	-10.4	-16.4	-22.7	0.0	10.0	3.3	7.1	ESE
16	995.2	-13.2	-10.7	-15.6	-25.6	0.7	9.3	6.2	9.5	E
17	992.6	-13.3	-12.4	-15.5	-22.8	0.2	9.5	5.6	8.2	E
18	989.3	-15.0	-12.0	-16.8	-25.3	5.7	6.0	6.5	8.0	E
19	979.5	-17.4	-15.7	-19.0	-29.7	4.3	4.3	8.4	11.9	ESE
20	981.1	-18.8	-18.0	-20.1	-30.2	0.0	6.0	8.0	9.7	E
Mean	989.7	-14.3	-12.3	-12.8	-24.8	1.3	7.4	6.4		
21	988.2	-14.3	-11.6	-18.9	-22.3	0.0	10.0	7.7	14.0	ESE
22	984.8	-11.9	-10.0	-14.0	-24.1	3.6	6.5	10.6	17.2	ESE
23	987.8	-13.2	-11.7	-15.9	-26.3	4.6	0.8	7.8	11.2	E
24	990.8	-14.1	-9.8	-19.3	-20.0	0.5	6.3	2.1	5.7	ENE
25	983.9	-19.0	-16.6	-23.3	-28.0	2.8	4.0	6.8	15.0	E
26	981.1	-19.9	-18.5	-21.0	-34.2	3.3	0.3	10.1	14.7	ESE
27	976.7	-20.0	-18.7	-22.1	-36.4	3.3	0.0	7.6	11.5	ESE
28	986.7	-21.7	-20.5	-23.0	-36.5	3.1	1.0	6.2	9.1	ESE
29	989.4	-23.0	-21.5	-23.6	-37.6	0.0	3.0	3.8	6.8	E
30	991.5	-22.7	-21.8	-24.3	-37.5	0.0	3.3	2.9	6.6	E
Mean	986.1	-18.0	-16.1	-20.5	-30.3	2.1	3.5	6.6		
Monthly Mean	989.9	-14.4	-12.4	-15.5	-25.7	2.0	5.5	6.9		

Table 2. Daily Summaries at Zhongshan Station, Antarctica in May 1989

Date	PST (hPa)	T _m (°C)	T _{max} (°C)	T _{min} (°C)	T _{dd} (°C)	S (h)	N (1 / 10)	V _m (m / s)	V _x (m / s)	
1	999.1	-19.4	-14.8	-25.1	-30.7	2.4	2.3	2.4	9.7	E
2	994.8	-15.0	-13.5	-17.3	-28.2	2.5	0.0	7.3	12.6	ESE
3	977.7	-13.2	-11.7	-16.2	-28.2	2.2	0.3	12.4	18.2	ESE
4	972.2	-18.0	-13.0	-22.1	-24.5	0.0	4.8	7.9	20.0	ESE
5	973.7	-23.2	-17.9	-26.0	-26.8	0.0	6.5	4.0	9.7	ENE
6	963.5	-17.5	-14.0	-20.7	-20.9	0.0	10.0	5.5	12.8	E
7	964.4	-19.7	-18.4	-21.2	-25.7	1.3	3.0	6.8	12.5	ESE
8	969.2	-20.4	-19.8	-21.0	-28.9	0.3	2.8	9.5	12.5	ESE
9	977.2	-20.4	-18.5	-25.0	-29.0	1.3	0.3	6.8	15.0	SE
10	982.8	-20.4	-18.6	-25.8	-24.5	0.0	7.5	1.8	4.5	ENE
Mean	977.5	-18.7	-16.0	-22.0	-26.7	1.0	3.8	6.4		
11	976.3	-19.6	-17.6	-22.5	-29.5	0.0	0.0	10.9	16.6	ESE
12	972.4	-22.9	-19.0	-24.7	-34.7	0.0	0.5	10.5	18.3	ESE
13	973.4	-23.8	-21.8	-25.3	-33.1	0.0	0.0	6.0	9.4	E
14	958.2	-15.5	-10.2	-22.6	-20.9	0.0	7.8	3.8	10.4	ESE
15	970.3	-20.6	-14.6	-21.8	-22.8	0.0	9.5	2.1	4.1	WNW
16	973.7	-24.1	-20.5	-29.4	-26.7	0.0	7.3	1.6	3.1	WNW
17	975.4	-29.3	-24.8	-31.6	-32.6	0.0	0.3	2.0	4.4	E
18	972.4	-22.3	-17.5	-32.5	-26.9	0.0	6.3	4.1	9.0	E
19	976.0	-22.5	-17.5	-25.5	-25.5	0.0	9.5	3.4	6.8	ENE
20	953.5	-9.5	-8.6	-12.5	-11.6	0.0	10.0	9.0	20.2	NE
Mean	970.2	-21.0	-17.2	-24.8	-26.2	0.0	5.1	5.3		
21	964.6	-17.5	-8.6	-25.2	-19.7	0.0	9.3	4.8	12.6	ENE
22	969.9	-12.7	-10.1	-16.3	-16.1	0.0	10.0	2.8	12.7	ENE
23	974.6	-13.4	-11.0	-14.6	-16.5	0.0	10.0	3.3	8.6	ENE
24	982.5	-17.1	-13.2	-19.1	-20.6	0.0	9.3	5.4	6.9	E
25	980.5	-21.0	-19.0	-24.5	-25.1	0.0	0.8	5.2	8.3	E
26	978.6	-23.3	-20.5	-25.5	-30.3	0.0	0.5	6.8	12.1	E
27	987.5	-24.9	-23.0	-25.8	-35.4	0.0	0.5	8.3	10.6	E
28	982.7	-18.5	-12.1	-26.8	-28.6	0.0	5.3	8.0	12.4	ESE
29	971.1	-8.3	-5.9	-12.6	-11.0	0.0	10.0	5.9	19.9	ESE
30	972.2	-8.9	-5.1	-13.4	-14.5	0.0	8.5	17.7	23.7	ESE
31	978.0	-15.0	-12.3	-15.7	-22.7	0.0	6.8	17.1	23.8	ESE
Mean	976.6	-16.4	-12.8	-20.0	-21.9	0.0	6.5	7.8		
Monthly Mean	974.8	-18.6	-15.3	-22.2	-24.8	0.3	5.2	6.6		

Table 2. Daily Summaries at Zhongshan Station, Antarctica in June 1989

Date	PST (hPa)	T _m (°C)	T _{max} (°C)	T _{min} (°C)	T _{dd} (°C)	S (h)	N (1 / 10)	V _m (m / s)	V _x (m / s)	
1	982.1	-10.7	-8.8	-13.8	-19.2	0.0	5.3	12.2	15.2	ESE
2	988.0	-15.7	-11.0	-17.7	-25.5	0.0	1.5	11.4	18.0	ESE
3	991.7	-15.3	-13.2	-17.6	-22.9	0.0	5.8	5.5	11.4	ESE
4	989.6	-13.3	-12.4	-16.1	-19.9	0.0	5.8	8.3	11.9	E
5	984.3	-15.0	-12.6	-17.7	-20.1	0.0	8.0	5.2	8.5	ESE
6	984.7	-14.4	-12.5	-15.7	-17.9	0.0	9.8	7.2	11.1	E
7	973.5	-8.1	-6.2	-13.0	-11.7	0.0	10.0	9.3	18.9	ESE
8	968.8	-7.8	-5.6	-9.7	-12.3	0.0	10.0	15.2	21.8	ESE
9	965.0	-7.3	-5.3	-8.7	-14.2	0.0	10.0	21.8	31.8	ESE
10	982.8	-12.4	-8.1	-14.2	-23.3	0.0	2.3	15.7	22.5	ESE
Mean	981.1	-12.0	-9.6	-14.4	-18.7	0.0	6.9	11.2		
11	993.0	-14.9	-13.2	-16.1	-26.1	0.0	5.0	8.5	14.5	ESE
12	991.5	-13.3	-11.0	-14.9	-15.7	0.0	9.5	1.6	2.6	WSW
13	982.9	-14.9	-10.2	-19.1	-17.8	0.0	3.8	1.8	3.2	S
14	980.1	-24.2	-18.0	-31.1	-24.6	0.0	5.0	1.6	3.3	ESE
15	990.9	-18.3	-16.0	-22.1	-20.4	0.0	10.0	3.4	9.9	E
16	988.6	-12.6	-11.0	-16.6	-16.3	0.0	10.0	6.3	13.1	ESE
17	975.0	-13.2	-10.8	-15.6	-10.0	0.0	7.0	12.6	18.0	ESE
18	967.2	-12.3	-11.4	-17.1	-21.1	0.0	8.8	7.6	12.6	ESE
19	963.6	-13.7	-9.5	-18.1	-16.1	0.0	10.0	6.0	20.8	ESE
20	983.0	-17.6	-16.1	-19.1	-19.8	0.0	10.0	3.9	7.6	WSW
Mean	981.6	-15.5	-12.7	-19.0	-19.8	0.0	7.9	5.3		
21	976.5	-21.9	-16.0	-27.0	-26.8	0.0	0.0	1.5	4.2	ESE
22	973.3	-16.0	-10.0	-23.5	-20.6	0.0	6.3	6.5	13.8	ESE
23	970.9	-9.9	-7.4	-13.0	-12.6	0.0	9.3	6.4	12.4	ENE
24	972.1	-11.2	-7.8	-13.6	-14.2	0.0	8.0	9.4	17.4	ENE
25	980.2	-14.5	-11.5	-17.6	-19.8	0.0	6.3	6.2	10.1	E
26	990.4	-20.5	-15.0	-25.4	-26.4	0.0	0.5	3.5	8.0	E
27	998.7	-20.8	-14.5	-27.0	-26.5	0.0	0.0	4.5	9.9	ESE
28	993.9	-25.4	-14.5	-30.2	-29.0	0.0	5.0	1.9	6.9	NE
29	986.8	-12.8	-11.4	-17.6	-23.1	0.0	6.0	11.7	16.3	ESE
30	1001.8	-14.9	-11.8	-17.6	-26.4	0.0	4.8	5.5	14.1	ESE
Mean	984.5	-16.8	-12.0	-21.3	-22.5	0.0	4.6	5.7		
Monthly Mean	982.4	-14.8	-11.4	-18.2	-20.3	0.0	6.5	7.4		

Table 2. Daily Summaries at Zhongshan Station, Antarctica in July 1989

Date	PST (hPa)	T _m (°C)	T _{max} (°C)	T _{min} (°C)	T _{dd} (°C)	S (h)	N (1 / 10)	V _m (m / s)	V _x (m / s)	
1	999.5	-15.3	-12.6	-17.1	-21.0	0.0	10.0	1.7	3.1	WNW
2	994.3	-12.9	-11.5	-15.6	-18.9	0.0	8.3	3.4	7.6	E
3	987.8	-17.7	-13.3	-20.6	-26.2	0.0	2.8	6.2	8.4	ESE
4	986.6	-21.5	-18.5	-24.2	-30.7	0.0	0.8	4.5	8.8	E
5	985.6	-23.0	-20.4	-24.3	-32.9	0.0	1.5	8.2	10.2	E
6	999.6	-26.9	-24.6	-29.7	-36.2	0.0	1.0	5.9	9.8	E
7	982.7	-21.8	-15.8	-30.2	-25.5	0.0	10.0	1.9	4.5	SW
8	973.2	-13.6	-11.2	-16.6	-18.3	0.0	10.0	6.7	14.7	ESE
9	972.7	-18.5	-15.0	-20.1	-27.5	0.0	1.0	10.0	13.0	ESE
10	967.6	-19.9	-18.8	-21.3	-28.7	0.0	0.0	10.0	14.4	E
Mean	985.0	-19.1	-16.2	-22.0	-26.6	0.0	4.5	5.9		
11	980.5	-23.1	-19.0	-24.3	-30.7	0.0	0.5	8.9	13.5	ESE
12	984.4	-22.9	-21.5	-25.0	-30.3	0.0	0.0	7.8	12.0	E
13	976.3	-17.5	-14.8	-24.0	-26.2	0.0	1.3	11.3	15.1	ESE
14	975.2	-15.0	-12.6	-17.6	-23.7	0.0	7.0	12.3	17.4	ESE
15	982.9	-16.1	-14.8	-17.9	-24.5	0.0	8.3	8.9	12.8	E
16	976.2	-14.6	-13.2	-16.1	-23.9	0.0	3.8	12.9	16.9	ESE
17	970.6	-6.6	-5.1	-13.3	-14.8	0.0	9.8	21.0	30.1	ESE
18	980.1	-11.3	-8.0	-14.9	-20.8	0.0	2.0	20.7	29.2	ESE
19	980.9	-13.3	-11.2	-16.2	-18.3	0.0	6.3	9.7	16.0	ESE
20	980.4	-14.9	-13.3	-16.6	-21.0	0.0	7.8	6.8	11.3	E
Mean	978.8	-15.5	-13.4	-18.6	-23.4	0.0	4.7	12.0		
21	975.5	-13.0	-10.0	-15.5	-21.3	0.0	2.8	7.6	12.9	ESE
22	971.4	-10.4	-6.7	-13.7	-20.0	0.0	8.5	8.2	16.7	ESE
23	958.5	-13.4	-10.7	-15.6	-22.2	0.0	2.5	12.7	19.1	ESE
24	968.3	-12.1	-11.2	-13.5	-15.4	0.0	10.0	9.2	13.4	E
25	978.9	-14.3	-12.0	-17.4	-19.3	0.0	4.0	8.5	13.3	ESE
26	971.5	-17.9	-16.6	-20.8	-20.3	0.0	7.5	1.7	3.2	ENE
27	977.3	-11.4	-10.0	-12.0	-15.1	0.0	8.5	10.0	15.5	E
28	984.3	-16.5	-11.5	-19.3	-26.2	0.0	0.5	10.7	13.3	ESE
29	982.7	-21.9	-18.6	-23.8	-19.7	0.0	0.0	9.2	13.6	ESE
30	980.4	-19.1	-13.2	-24.0	-25.5	0.0	0.3	4.6	11.9	E
31	984.5	-11.2	-9.4	-13.5	-19.8	0.0	6.5	12.8	17.3	ESE
Mean	975.8	-14.7	-11.8	-17.2	-21.3	0.0	4.6	8.7		
Monthly Mean	979.7	-16.4	-13.7	-19.2	-23.7	0.0	4.6	8.8		

Table 2. Daily Summaries at Zhongshan Station, Antarctica in August 1989

Date	PST (hPa)	T _m (°C)	T _{max} (°C)	T _{min} (°C)	T _{dd} (°C)	S (h)	N (1/10)	V _m (m/s)	V _x (m/s)	
1	990.3	-13.8	-11.3	-15.3	-22.4	0.0	4.8	10.6	17.0	ESE
2	960.2	-8.1	-5.1	-15.5	-11.8	0.0	10.0	16.1	29.7	E
3	964.8	-8.0	-4.8	-12.4	-11.1	0.0	10.0	14.4	22.6	ENE
4	981.7	-15.4	-9.0	-16.8	-19.4	0.0	6.0	6.5	13.6	ESE
5	981.2	-18.5	-14.0	-19.4	-25.7	0.0	3.3	10.7	14.3	ESE
6	983.9	-16.3	-9.5	-20.1	-22.3	0.0	4.5	9.7	15.8	ESE
7	986.0	-9.5	-8.6	-10.5	-12.4	0.0	10.0	7.9	16.6	ENE
8	993.0	-8.5	-6.5	-9.0	-15.5	0.0	9.0	14.6	20.7	ESE
9	984.9	-12.3	-6.1	-15.9	-24.5	0.0	2.8	18.9	22.7	ESE
10	986.5	-18.9	-12.0	-22.1	-16.5	2.1	1.8	13.8	23.0	ESE
Mean	981.3	-12.9	-8.7	-15.7	-19.2	0.2	6.2	12.3		
11	988.8	-14.1	-9.4	-21.5	-16.9	0.0	10.0	4.6	10.9	E
12	982.3	-13.1	-9.5	-15.8	-20.2	0.0	7.5	12.5	17.6	ESE
13	984.6	-13.4	-9.2	-19.5	-18.9	0.0	8.3	8.5	14.2	ESE
14	990.5	-9.1	-8.0	-9.6	-15.3	0.0	10.0	15.2	19.6	ESE
15	989.6	-10.7	-8.5	-11.1	-20.7	1.2	7.0	11.7	15.0	ESE
16	986.9	-9.2	-7.1	-12.9	-16.9	0.0	7.0	8.8	15.0	E
17	986.9	-7.8	-5.2	-9.3	-10.5	0.0	10.0	16.4	21.2	ENE
18	977.6	-7.0	-5.6	-7.6	-12.0	0.0	10.0	21.7	27.0	ESE
19	977.5	-12.3	-7.1	-15.9	-22.2	2.5	2.8	17.2	20.7	ESE
20	981.9	-17.9	-9.5	-19.7	-26.2	4.0	0.0	9.1	13.6	E
Mean	984.7	-11.5	-7.9	-14.3	-18.0	0.8	7.3	12.6		
21	990.7	-20.4	-12.7	-22.6	-28.8	4.3	0.0	5.1	11.5	E
22	994.7	-26.1	-14.5	-30.9	-31.1	4.5	0.0	1.8	4.8	WNW
23	993.3	-30.9	-17.3	-33.6	-34.0	2.7	2.0	1.7	3.7	WNW
24	978.5	-14.8	-10.5	-29.9	-24.4	0.0	7.5	6.7	18.8	ESE
25	971.0	-14.0	-11.6	-14.3	-19.6	0.0	10.0	10.9	17.5	ESE
26	984.7	-12.4	-10.5	-14.6	-17.4	0.0	9.3	7.8	12.5	ESE
27	988.7	-16.8	-12.5	-18.3	-24.6	4.4	3.8	12.3	19.2	ESE
28	999.0	-14.8	-10.8	-18.1	-21.6	3.6	6.5	2.8	9.2	SE
29	999.5	-6.6	-1.2	-16.1	-13.0	0.0	7.5	6.7	12.0	ENE
30	1006.1	-0.2	-0.9	-1.4	-8.9	0.0	10.0	14.4	23.2	E
31	1009.9	-2.5	-0.7	-2.9	-15.8	5.1	5.3	13.2	17.5	E
Mean	992.4	-14.5	-9.2	-18.4	-21.7	2.2	5.6	8.3		
Monthly Mean	986.3	-13.0	-8.6	-16.2	-19.7	1.1	6.3	10.7		