

## TITLE

CAMP\_Tibet\_BJ-Tower\_20021001\_20030331.twr

## CONTACT

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## DATE OF THIS DOCUMENT

02 Sep. 2004 (Updated 23 Jun. 2006)

## 1. 0 DATASET OVERVIEW

### 1.1 Introduction

To clarify the energy and water cycle in the Tibetan Plateau, it is important to understand the characteristics of the basic meteorological elements and surface fluxes.

The purpose of Tibet AWS (Automatic Weather Station) observation is to improve the quantitative understanding of land-atmosphere interactions over the Tibetan Plateau and develop the land surface process models by monitoring these meteorological values.

## 1.2 Time period covered by the data

Start: 1 October 2002, 00:00

End: 31 March 2003, 23:00

## 1.3 Temporal characteristics of the data

All parameters are recorded every hour.

## 1.4 Physical location of the measurement

Latitude : 31.36866 N  
Longitude : 91.89871 E  
Elevation : 4509.2 m a.s.l.  
Landscape : Bare land (with the thin weed-like plant)  
Canopy height : Less than 5cm.  
Soil Characteristics: Sand

## 1.5 Data source

## 1.6 Website address references

<http://monsoon.t.u-tokyo.ac.jp/camp/tibets/>

## 2.0 INSTRUMENTATION DESCRIPTION

### 2.1 Platform

The BJ site is located about 20 km southwest from the city of Naqu in the eastern Tibetan Plateau. This AWS was constructed in summer 2000. The system is originally same as that of D105, MS3478 (N-PAM) and ANNI. The direct incoming solar radiation and the scattered solar radiation measurement were added in June 2002. BJ site is the most enhanced observation site in the Tibetan Plateau: not only hydro-meteorological observation by AWS and SMTMS system, but atmospheric profile measurement by wind profiler, radiosonde, etc.

### 2.2 Description of the instrumentation

Parameter	Model	Manufacturer
Station Pressure	PTB220C	Vaisala
Air Temperature	TS-801(Pt100)	Okazaki
Relative Humidity	HMP-45D	VAISALA
Wind Speed	WS-D32	Komatsu
Wind Direction	WS-D32	Komatsu

### 2.3 Instrumentation specification

Air Temperature (8.2m) : Air Temperature at the 8.2m height (deg.C)  
Air Temperature (1.0m) : Air Temperature at the 1.0m height (deg.C)  
Relative Humidity (8.2m) : Relative Humidity at the 8.2m height (%)  
Relative Humidity (1.0m) : Relative Humidity at the 1.0m height (%)  
Wind Speed (10.0m) : Wind Speed at the 10.0m height (m/s)  
Wind Speed (5.0m) : Wind Speed at the 5.0m height (m/s)

Wind Speed (1.0m) : Wind Speed at the 1.0m height (m/s)  
Wind Direction (10.0m) : Wind Direction at the 10.0m height (deg.)

### **3.0 DATA COLLECTION AND PROCESSING**

#### **3.1 Description of data collection**

Original data are sampled at every 5 seconds (0.2Hz) and 10-minute average is computed and stored in a data logger (Campbell CR-10X).  
Data are downloaded from the Tower twice every year, in spring and summer. Then, data are sent to Japan, where they are processed.

#### **3.2 Description of derived parameters and processing techniques used**

Air Temperature, relative humidity, Wind speed and Wind direction averaged over the previous hour. Air pressure is instantaneous values of each 1 hour.

And the one parameters indicated below were computed by using "CEOP Derived Parameter Equations : [http://www.joss.ucar.edu/ghp/ceopdm/refdata\\_report/eqns.html](http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html)" . also put the data flag "I",

U,V Components were computed by using (GEMPAK):

$$U = -\sin(\text{direction}) * \text{wind\_speed};$$

$$V = -\cos(\text{direction}) * \text{wind\_speed};$$

### **4.0 QUALITY CONTROL PROCEDURES**

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.

The quality control flags follow the CEOP data flag definition document.

### **5.0 GAP FILLING PROCEDURES**

No gap filling procedure was applied.

### **6.0 DATA REMARKS**

#### **6.1 PI's assessment of the data**

##### **6.1.1 Instruments problems**

The barometer (PTB-220, VAISALA) had problem since Jun 2002 and once removed back to Japan in Aug. 2002 to repair. Hence, the barometric pressure was not measured throughout EOP-III (until re-installed in late Sep. 2003).

##### **6.1.2 Quality issues**

## 6.2 Missing data periods

None

## **7.0 REFERENCE REQUIREMENTS**

Original data was collected and is provided within the framework of GAME/CAMP Tibet Scientific and Technological Research Project, funded by the Ministry of Education, Culture, Sports, Science and Technology; the Japan Science and Technology Agency; the Frontier Research System for Global Change; the Japan Aerospace Exploration Agency; the Chinese Academy of Sciences; and the Chinese Academy of Meteorological Sciences.

## **8.0 REFERENCES**

H. Ishikawa and GAME-Tibet Boundary Layer Group, 2001: What has been known and what has not in GAME/Tibet BL observation, Proceedings of the Fifth International Study Conference on GEWEX in Asia and GAME, 691.

Ma, Yaoming, O. Tsukamoto, H. Ishikawa, Z. Su, M. Menenti, J. Wang and J. Wen, 2002: Determination of regional land surface heat flux densities over heterogeneous landscape of HEIFE integrating satellite remote sensing with field observations, Jour. Meteorol. Soc. Japan, 80(3), 485-501.

K. Tanaka, I. Tamagawa, H. Ishikawa, Y. Ma and Z. Hu, 2003: Surface energy and closure of the eastern Tibetan Plateau during the GAME-Tibet IOP 1998, J. Hydrology, vol. 283, pp. 169-183

K. Tanaka and H. Ishikawa, 2001: Long term monitoring of surface energy fluxes of the Amdo PBL site in the eastern Tibetan Plateau, Proceedings of the Fifth International Study Conference on GEWEX in Asia and GAME, 384-388.

Ueno, K., H. Fujii, H. Yamada and L. Liu, (2001) Weak and Frequent Monsoon Precipitation over the Tibetan Plateau. J. Meteor. Soc. Japan, 79, 1B, 419-434.

## TITLE

CAMP\_Tibet\_BJ-Tower\_20030401\_20030930.twr

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## DATE OF THIS DOCUMENT

19 Apr. 2006

## 1. 0 DATASET OVERVIEW

### 1.7 Introduction

To clarify the energy and water cycle in the Tibetan Plateau, it is important to understand the characteristics of the basic meteorological elements and surface fluxes.

The purpose of Tibet AWS (Automatic Weather Station) observation is to improve the quantitative understanding of land-atmosphere interactions over the Tibetan Plateau and develop the land surface process models by monitoring these meteorological values.

### 1.8 Time period covered by the data

Start: 1 October 2002, 00:00  
End: 30 September 2003, 23:00

### 1.9 Temporal characteristics of the data

All parameters are recorded every hour.

### 1.10 Physical location of the measurement

Latitude : 31.36866 N  
Longitude : 91.89871 E  
Elevation : 4509.2 m a.s.l.  
Landscape : Bare land (with the thin weed-like plant)  
Canopy height : Less than 5cm.  
Soil Characteristics: Sand

### 1.11 Data source

### 1.12 Website address references

<http://monsoon.t.u-tokyo.ac.jp/camp/tibets/>

## 2.0 INSTRUMENTATION DESCRIPTION

### 2.1 Platform

The BJ site is located about 20 km southwest from the city of Naqu in the eastern Tibetan Plateau. This AWS was constructed in summer 2000. The system is originally same as that of D105, MS3478 (N-PAM) and ANNI. The direct incoming solar radiation and the scattered solar radiation measurement were added in June 2002. BJ site is the most enhanced observation site in the Tibetan Plateau: not only hydro-meteorological observation by AWS and SMTMS system, but atmospheric profile measurement by wind profiler, radiosonde, etc.

### 2.2 Description of the instrumentation

Parameter	Model	Manufacturer
Station Pressure	N/A	N/A
Air Temperature	TS-801(Pt100)	Okazaki
Relative Humidity	HMP-45D	VAISALA
Wind Speed	WS-D32	Komatsu
Wind Direction	WS-D32	Komatsu

### 2.4 Instrumentation specification

Air Temperature (8.2m) : Air Temperature at the 8.2m height (deg.C)  
Air Temperature (1.0m) : Air Temperature at the 1.0m height (deg.C)  
Relative Humidity (8.2m) : Relative Humidity at the 8.2m height (%)  
Relative Humidity (1.0m) : Relative Humidity at the 1.0m height (%)  
Wind Speed (10.0m) : Wind Speed at the 10.0m height (m/s)  
Wind Speed (5.0m) : Wind Speed at the 5.0m height (m/s)  
Wind Speed (1.0m) : Wind Speed at the 1.0m height (m/s)  
Wind Direction (10.0m) : Wind Direction at the 10.0m height (deg.)

### 3.0 DATA COLLECTION AND PROCESSING

#### 3.1 Description of data collection

Original data are sampled at every 5 seconds (0.2Hz) and 10-minute average is computed and stored in a data logger (Campbell CR-10X). Data are downloaded from the Tower twice every year, in spring and summer. Then, data are sent to Japan, where they are processed.

#### 3.2 Description of derived parameters and processing techniques used

Air Temperature, relative humidity, Wind speed and Wind direction averaged over the previous hour. Air pressure is instantaneous values of each 1 hour.

One humidity sensor is set up for the comparison the performance of No.1 (9.3 m) and No.2 (1.0m) humidity sensor. This reference sensor is exchanged its level (From 1.0 m to 8.2 m) or down (From 8.2 m to 1.0m) for every operation. We selected the couple of dataset (No.1 main sensor and No.1 reference sensor; No2. main sensor and No. 2 reference sensor) just before or after 5 days of the operation, and made the linear regressions.

$$RH1 = a1 * RH\_ref + b1$$

$$RH2 = a1 * RH\_ref + b2$$

From these two equations, the regression function between RH1 and RH2 can be derived as

$$RH2 = a * RH1 + b$$

RH2 (1.0 m) was corrected as a reference of RH1 using above relation and put the data flag "I".

Because of the calibration coefficients were changed very slowly, monthly value was computed linearly.

	A	B
2003-Apr	0.9935	-0.1056
2003-May	0.9940	-0.1557
2003-Jun	0.9945	-0.2059
2003-Jul	0.9950	-0.2560
2003-Aug	0.9955	-0.3062
2003-Sep	0.9960	-0.3563

And the one parameters indicated below were computed by using "CEOP Derived Parameter Equations : [http://www.joss.ucar.edu/ghp/ceopdm/refdata\\_report/eqns.html](http://www.joss.ucar.edu/ghp/ceopdm/refdata_report/eqns.html)" . also put the data flag "I",

U,V Components were computed by using (GEMPAK):

$$U = -\sin(\text{direction}) * \text{wind\_speed};$$

$$V = -\cos(\text{direction}) * \text{wind\_speed};$$

Specific Humidity (Qv) was computed by using

$$Qv = 0.622 Rv / ( 1 + Rv)$$

$$Rv = \text{Evap} / \text{Air\_Pressure}$$

Evap = Rh \* 0.01 \* Evap\_sat  
Evap\_sat = 6.1078<sup>(a\*Air\_Temp/(b+Air\_Temp))</sup>  
( a = 7.5, b = 237.3 for Air\_Temp >= 0 degC; a = 9.5, b = 265.3 for Air\_Temp < 0)

#### **4.0 QUALITY CONTROL PROCEDURES**

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values thorough the CAMP Quality Control Web Interface.

The quality control flags follow the CEOP data flag definition document.

#### **5.0 GAP FILLING PROCEDURES**

No gap filling procedure was applied.

#### **6.0 DATA REMARKS**

##### 6.1 PI's assessment of the data

##### 6.1.1 Instruments problems

The barometer (PTB-220, VAISALA) had problem since Jun 2002 and once removed back to Japan in Aug. 2002 to repair. Hence, the barometric pressure was not measured throughout EOP-III (until re-installed in late Sep. 2003).

##### 6.1.2 Quality issues

##### 6.2 Missing data periods

None

#### **7.0 REFERENCE REQUIREMENTS**

Original data was collected and is provided within the framework of GAME/CAMP Tibet Scientific and Technological Research Project, funded by the Ministry of Education, Culture, Sports, Science and Technology; the Japan Science and Technology Agency; the Frontier Research System for Global Change; the Japan Aerospace Exploration Agency; the Chinese Academy of Sciences; and the Chinese Academy of Meteorological Sciences.

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Ueno, K., H. Fujii, H. Yamada and L. Liu, (2001) Weak and Frequent Monsoon Precipitation over the Tibetan Plateau. J. Meteor. Soc. Japan, 79, 1B, 419-434.

## **9.0 Missing data periods**

None

## TITLE

CAMP\_Tibet\_BJ-Tower\_20031001\_20040830.twr

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## DATE OF THIS DOCUMENT

7 July, 2006

## 1. 0 DATASET OVERVIEW

### 1.13 Introduction

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The purpose of Tibet AWS (Automatic Weather Station) observation is to improve the quantitative understanding of land-atmosphere interactions over the Tibetan Plateau and develop the land surface process models by monitoring these meteorological values.

### 1.14 Time period covered by the data

Start: 1 October 2003, 00:00  
End: 30 August 2004, 23:00

### 1.15 Temporal characteristics of the data

All parameters are recoded every hour.

### 1.16 Physical location of the measurement

Latitude : 31.36866 N  
Longitude : 91.89871 E  
Elevation : 4509.2 m a.s.l.  
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### 1.17 Data source

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### 2.2 Description of the instrumentation

Parameter	Model	Manufacturer
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Air Temperature	TS-801(Pt100)	Okazaki
Relative Humidity	HMP-45D	VAISALA
Wind Speed	WS-D32	Komatsu
Wind Direction	WS-D32	Komatsu

### 2.5 Instrumentation specification

Air Temperature (8.2m) : Air Temperature at the 8.2m height (deg.C)  
Air Temperature (1.0m) : Air Temperature at the 1.0m height (deg.C)  
Relative Humidity (8.2m) : Relative Humidity at the 8.2m height (%)  
Relative Humidity (1.0m) : Relative Humidity at the 1.0m height (%)  
Wind Speed (10.0m) : Wind Speed at the 10.0m height (m/s)  
Wind Speed (5.0m) : Wind Speed at the 5.0m height (m/s)  
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### 3.0 DATA COLLECTION AND PROCESSING

#### 3.1 Description of data collection

Original data are sampled at every 5 seconds (0.2Hz) and 10-minute average is computed and stored in a data logger (Campbell CR-10X). Data are downloaded from the Tower twice every year, in spring and summer. Then, data are sent to Japan, where they are processed.

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$$RH1 = a1 * RH\_ref + b1$$

$$RH2 = a1 * RH\_ref + b2$$

From these two equations, the regression function between RH1 and RH2 can be derived as

$$RH2 = a * RH1 + b$$

RH2 (1.0 m) was corrected as a reference of RH1 using above relation and put the data flag "I".

Because of the calibration coefficients were changed very slowly, monthly value was computed linearly.

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$$Qv = 0.622 Rv / ( 1 + Rv)$$

$$Rv = \text{Evap} / \text{Air\_Pressure}$$

Evap = Rh \* 0.01 \* Evap\_sat  
Evap\_sat = 6.1078<sup>(a\*Air\_Temp/(b+Air\_Temp))</sup>  
( a = 7.5, b = 237.3 for Air\_Temp >= 0 degC; a = 9.5, b = 265.3 for Air\_Temp < 0)

#### **4.0 QUALITY CONTROL PROCEDURES**

For all parameters, the data has been visually checked, looking for extremely and unusual low/high values and/or periods with constant values through the CAMP Quality Control Web Interface.

The quality control flags follow the CEOP data flag definition document.

#### **5.0 GAP FILLING PROCEDURES**

No gap filling procedure was applied.

#### **6.0 DATA REMARKS**

##### 6.1 PI's assessment of the data

##### 6.1.1 Instruments problems

The barometer (PTB-220, VAISALA) had problem since Jun 2002 and once removed back to Japan in Aug. 2002 to repair. Hence, the barometric pressure was not measured throughout EOP-III (until re-installed in late Sep. 2003).

##### 6.1.2 Quality issues

##### 6.2 Missing data periods

None

#### **7.0 REFERENCE REQUIREMENTS**

Original data was collected and is provided within the framework of GAME/CAMP Tibet Scientific and Technological Research Project, funded by the Ministry of Education, Culture, Sports, Science and Technology; the Japan Science and Technology Agency; the Frontier Research System for Global Change; the Japan Aerospace Exploration Agency; the Chinese Academy of Sciences; and the Chinese Academy of Meteorological Sciences.

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Ma, Yaoming, O. Tsukamoto, H. Ishikawa, Z. Su, M. Menenti, J. Wang and J. Wen, 2002: Determination of regional land surface heat flux densities over heterogeneous landscape

of HEIFE integrating satellite remote sensing with field observations, Jour. Meteorol. Soc. Japan, 80(3), 485-501.

K. Tanaka, I. Tamagawa, H. Ishikawa, Y. Ma and Z. Hu, 2003: Surface energy and closure of the eastern Tibetan Plateau during the GAME-Tibet IOP 1998, J. Hydrology, vol. 283, pp. 169-183

K. Tanaka and H. Ishikawa, 2001: Long term monitoring of surface energy fluxes of the Amdo PBL site in the eastern Tibetan Plateau, Proceedings of the Fifth International Study Conference on GEWEX in Asia and GAME, 384-388.

Ueno, K., H. Fujii, H. Yamada and L. Liu, (2001) Weak and Frequent Monsoon Precipitation over the Tibetan Plateau. J. Meteor. Soc. Japan, 79, 1B, 419-434.

## 9.0 Missing data periods

-----  
File Name : CAMP\_Tibet\_BJ-Tower\_20031001\_20040830.twr  
Data Period : 2003/10/01 00:00 - 2004/08/30 23:00  
-----

Station Pressure (1.00m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

Station Pressure (5.00m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

Station Pressure (8.20m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

Station Pressure (10.00m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

Air Temperature (1.00m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

Air Temperature (5.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Air Temperature (8.20m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

Air Temperature (10.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Dew Point Temperature (1.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Dew Point Temperature (5.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Dew Point Temperature (8.20m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Dew Point Temperature (10.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Relative Humidity (1.00m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

Relative Humidity (5.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Relative Humidity (8.20m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

Relative Humidity (10.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Specific Humidity (1.00m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

Specific Humidity (5.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Specific Humidity (8.20m)

2004/04/24 20:00 - 2004/06/06 20:00 (1033)

2004/08/29 19:00 - 2004/08/30 23:00 (29)

Specific Humidity (10.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Wind Speed (1.00m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

Wind Speed (5.00m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

Wind Speed (8.20m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Wind Speed (10.00m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

Wind Direction (1.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Wind Direction (5.00m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Wind Direction (8.20m)

2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

Wind Direction (10.00m)

2004/04/25 04:00 - 2004/06/06 20:00 (1025)

2004/08/30 02:00 - 2004/08/30 23:00 (22)

U Wind Component (1.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

U Wind Component (5.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

U Wind Component (8.20m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

U Wind Component (10.00m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)

V Wind Component (1.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

V Wind Component (5.00m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

V Wind Component (8.20m)  
2003/10/01 00:00 - 2004/08/30 23:00 (ALL)

V Wind Component (10.00m)  
2004/04/25 04:00 - 2004/06/06 20:00 (1025)  
2004/08/30 02:00 - 2004/08/30 23:00 (22)