

**Summary of Meteorological Data collected at the  
El Tofo Summit and Ridge Sites in Chile  
During the Camanchaca project from 1987 to 1989**

This was a joint project of the University of Chile, the Pontificia University of Chile, The National Forestry Corporation of Chile and the Atmospheric Environment Service of Environment Canada. The core sponsor of the project was The International Development Research Centre in Ottawa, Canada.

The meteorological data collection was under the supervision of Dr. Robert Schemenauer of the Atmospheric Environment Service with the technical help of Mohammed Wasey and Steve Bacic.

These datafiles are being made available in 2022 without any further data processing or any revision from the original results.

**CHILE DATA SUMMARY**  
1987 - 1989

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**Meteorological data:**

Introduction

This a summary of meteorological data available for the 1987, 1988, and 1989 field projects. In each year there is meteorological data available for both the summit and ridge sites. This data has been corrected using the field notes as a reference. The data was summarized in a similar format to the 1990 Peru meteorological data.

Summary Tables

The average, maximum, and minimum for each field period have been calculated for temperature, relative humidity, pressure, solar radiation, wind speed and wind direction. These parameter values are presented in table format. There are two tables, the first is the meteorological parameter summary of the five (5) minute data. This table includes the 5 minute average and maximum peak gust (instantaneous) values. On the same page is the meteorological parameter summary of the five (5) minute data when the wind direction was  $270^{\circ} \pm 20^{\circ}$ .

The second table is the meteorological parameter summary of the hourly data (calculated from the 5 minute data). Included on this table is the hourly average and maximum peak gust (instantaneous) values. A summary table for when the wind direction was  $270^{\circ} \pm 20^{\circ}$  is also available.

### Raw Data

The meteorological data was processed from scratch for the 1987 - 1989 using the .DAT files that were available on diskette. The exception was the 1989 Ridge data which had been received from Chile in LOTUS worksheet format. This data contained u and v components, where u is the zonal component of the wind vector in metres per second [positive from W to E] and v refers to the meridional component of the wind vector in metres per second [positive from S to N]. From the two components the wind speed and wind direction can be calculated.

All of the data, with the exception of the 1989 Ridge, are recorded in five (5) minute intervals. The hourly data was calculated from twelve 5 minute blocks (i.e. 12:05 - 13:00). The 1989 Ridge data was recorded in fifteen (15) minute intervals and the hourly data was calculated from four 15 minute blocks (i.e. 12:15 - 13:00).

### Wind Data

An analysis of the wind data for each of the years includes frequency and cumulative frequency distributions of the wind speed data and two frequency distributions of the wind direction. The wind speed frequency distribution is plotted as histograms and the wind direction frequency distribution is plotted as polar coordinate graphs. The diurnal cycle of wind speed and diurnal variation of wind direction is plotted for each site and year. In 1989 there was a wind speed position inter-comparison done on the Summit using data from the met tower and data from a sensor located near the mesh.

## Meteorological Parameters

Individual hourly data summaries for each meteorological parameter during the field periods are available. These give the hourly values for the entire period and calculations of the daily average, maximum and minimum daily average, as well as the average, maximum, minimum, and standard deviation for the entire period. The solar radiation hourly data summary includes the daily maximum and a summary of the daily maximum hourly solar radiation, including average, maximum, minimum, and the ratio of minimum/maximum. The units for each of the parameters are as follows:

Wind speed	$\text{m s}^{-1}$	(metres per second)
Wind direction	$^{\circ}$	(degrees)
Temperature	$^{\circ}\text{C}$	(degrees celsius)
Relative humidity	%	(percent)
Pressure	mb	(millibar)
Solar radiation	$\text{W m}^{-2}$	(watts per metre squared)
Peak gust	$\text{m s}^{-1}$	(metres per second)

Averages of the meteorological parameters at the El Tofo, Chile ridge site. The maximum 5 minute and peak instantaneous wind speeds for the period are also given.

Field period	$w_s$ ( $m s^{-1}$ )	$w_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W m^{-2}$ )	Max $w_s$ ( $m s^{-1}$ )	Peak $w_s$ ( $m s^{-1}$ )
1987	2.66	183	13.1	84.9	930	269	9.19	11.14
1988	2.40	173	11.1	81.1	930	222	6.75	7.95
1989	2.60	219	10.9	71.0	931	157	5.80*	-

\* 15 minute value



**CHILE METEOROLOGICAL DATA**

Year: 1987  
 Site: RIDGE  
 Period: 304-318

Average and maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987 :  
 (5 minute average data)

Parameter	$W_s$ ( $m s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m s^{-1}$ )
Average	2.66	183	13.1	84.9	930	3.35
Maximum	9.19	314	22.6	109.5	934	11.14
Minimum	0.45	24	8.4	29.5	925	

Average and maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987 when wind direction was  $270^{\circ} \pm 20^{\circ}$  :  
 (5 minute average data)

Parameter	$W_s$ ( $m s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m s^{-1}$ )
Average	3.62	257	12.4	92.1	931	4.59
Maximum	9.04	289	19.6	107.2	934	11.14
Minimum	0.45	250	8.4	39.6	927	

**CHILE METEOROLOGICAL DATA**Year: 1987Site: RIDGEPeriod: 304-318Hourly average and hourly maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987 :

(from 5 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )	Hourly Peak Gust ( $m\ s^{-1}$ )
Average	2.66	183	13.1	84.9	930	269	3.35
Maximum	8.23	269	20.8	100.8	934	1147	9.88
Minimum	0.59	48	8.6	39.5	925	0	

Hourly average and hourly maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987 when wind direction was  $270^{\circ} \pm 20^{\circ}$  :

(from 5 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )	Hourly Peak Gust ( $m\ s^{-1}$ )
Average	3.92	255	12.5	92.3	931	412	4.96
Maximum	7.10	269	15.7	100.5	934	1142	9.13
Minimum	1.72	250	9.9	74.3	927	0	

File: ER7HRWS.WQ1

Chile 1987 - Ridge

Hourly Ws data

Period: October 31 - November 14

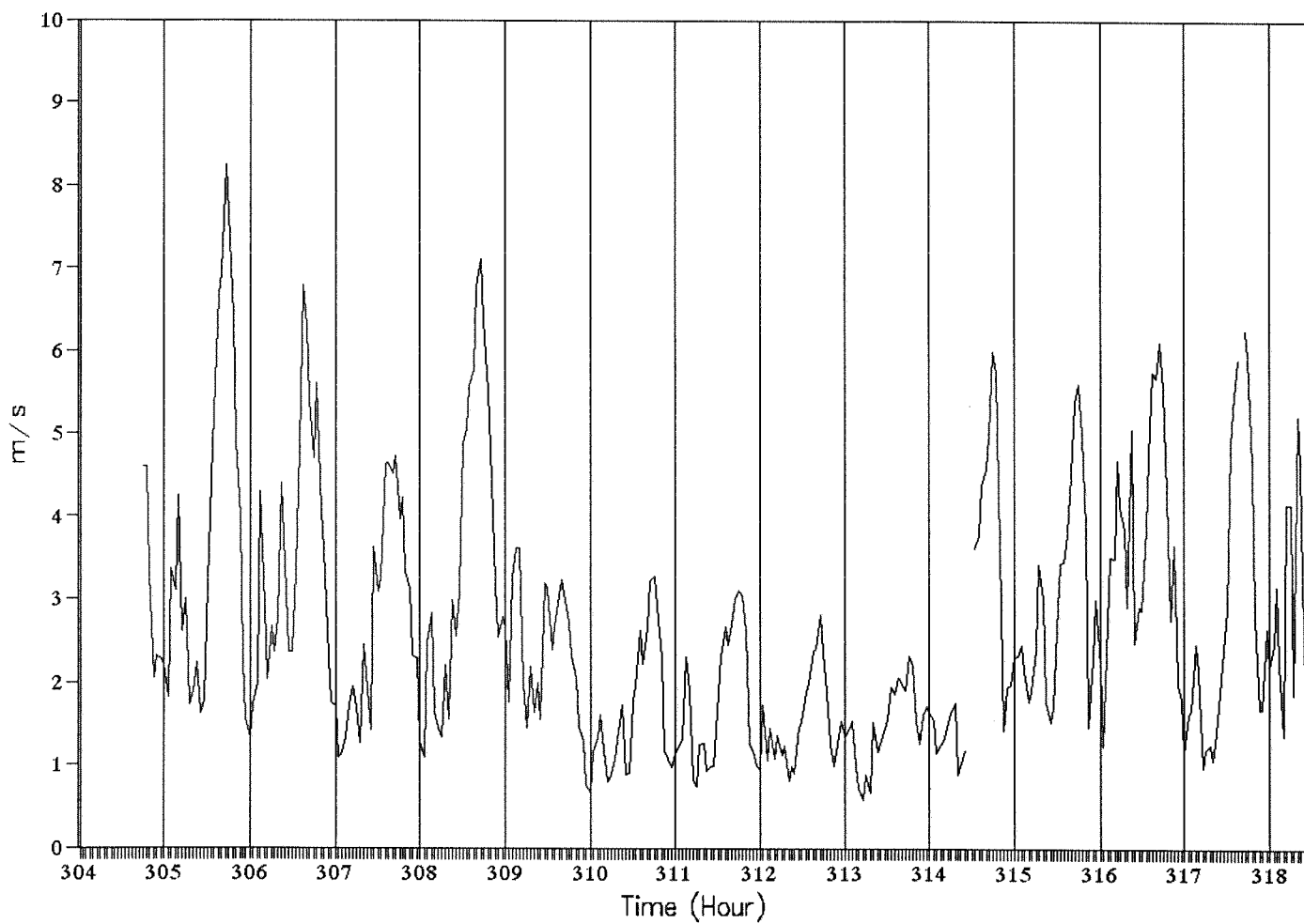
Wind Speed TIME/JD	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100		1.81	1.73	1.09	1.08	1.74	1.16	1.23	1.73	1.41	1.56	2.32	1.23	1.63	2.45
200		3.37	2.00	1.15	2.47	3.24	1.32	1.32	1.06	1.54	1.14	2.45	2.72	1.66	3.16
300		3.10	4.29	1.34	2.82	3.61	1.61	2.31	1.45	0.98	1.24	2.14	3.51	2.47	2.24
400		4.23	2.89	1.72	1.64	3.60	1.18	1.90	1.07	0.72	1.29	1.77	3.48	2.15	1.36
500		2.59	2.02	1.94	1.45	1.98	0.79	0.81	1.37	0.59	1.53	1.91	4.66	0.97	4.15
600		3.00	2.67	1.68	1.33	1.45	0.88	0.74	1.13	0.88	1.64	2.41	4.12	1.19	4.15
700		1.73	2.35	1.25	2.20	2.19	1.08	1.25	1.22	0.67	1.75	3.42	3.83	1.25	1.85
800		1.88	2.76	2.44	1.55	1.64	1.40	1.26	0.81	1.52	0.88	3.02	2.91	1.06	5.22
900		2.23	4.38	1.91	2.98	1.98	1.72	0.93	0.98	1.16	0.98	1.77	5.05	1.41	4.63
1000		1.63	3.40	1.42	2.55	1.55	0.87	0.99	0.90	1.26	1.18	1.53	2.47	1.89	1.91
1100		1.76	2.36	3.63	3.09	3.19	0.89	0.99	1.47	1.46		1.70	2.92	2.41	3.02
1200		3.17	2.36	3.08	4.87	3.12	1.76	1.86	1.52	1.55		2.64	2.86	2.88	
1300		4.42	3.33	3.24	5.06	2.40	1.96	2.33	1.89	1.93	3.62	3.44	3.87	4.87	
1400		5.24	4.83	4.62	5.57	2.67	2.62	2.68	2.00	1.86	3.76	3.46	4.75	5.48	
1500		6.66	6.79	4.64	5.77	3.03	2.22	2.45	2.37	2.06	4.37	3.80	5.75	5.89	
1600		6.93	6.30	4.49	6.78	3.23	2.65	2.68	2.40	1.97	4.57	4.50	5.69		
1700		8.23	5.39	4.73	7.10	2.88	3.20	3.00	2.81	1.91	4.99	5.38	6.11	6.25	
1800	4.58	7.64	4.70	3.96	6.37	2.71	3.27	3.10	2.36	2.32	5.99	5.61	5.54	5.94	
1900	4.59	6.41	5.61	4.22	5.50	2.32	2.91	3.03	1.88	2.21	5.75	4.98	4.28	4.62	
2000	3.30	4.89	4.04	3.31	4.80	2.05	2.28	2.61	1.25	1.53	3.62	3.85	2.76	2.79	
2100	2.04	3.98	3.59	3.12	3.20	1.47	1.16	1.25	0.98	1.26	1.43	1.47	3.64	1.68	
2200	2.31	2.24	2.28	2.32	2.53	1.30	1.06	1.15	1.26	1.61	1.95	2.31	2.00	1.67	
2300	2.26	1.56	1.74	2.28	2.77	0.76	0.96	0.99	1.54	1.71	1.97	3.00	1.80	2.66	
0	2.21	1.33	1.72	1.28	2.65	0.68	1.15	0.95	1.35	1.65	2.31	2.22	1.16	2.18	
Daily Average:	3.04	3.75	3.48	2.70	3.59	2.28	1.67	1.74	1.53	1.49	2.61	2.96	3.63	2.83	3.10

Ridge - 1987

Average:	2.66	Maximum Daily Average:	3.75
Maximum:	8.23	Minimum Daily Average:	1.49
Minimum:	0.59		
Std.Dev:	1.53		

# Wind Speed

## Chile 1987 - Ridge



**CHILE 1987 METEOROLOGICAL DATA**Site: RIDGEPeriod: October 31 - November 14, 1987 (JD:304-318)Frequency distribution for hourly wind speed ( $m\ s^{-1}$ )

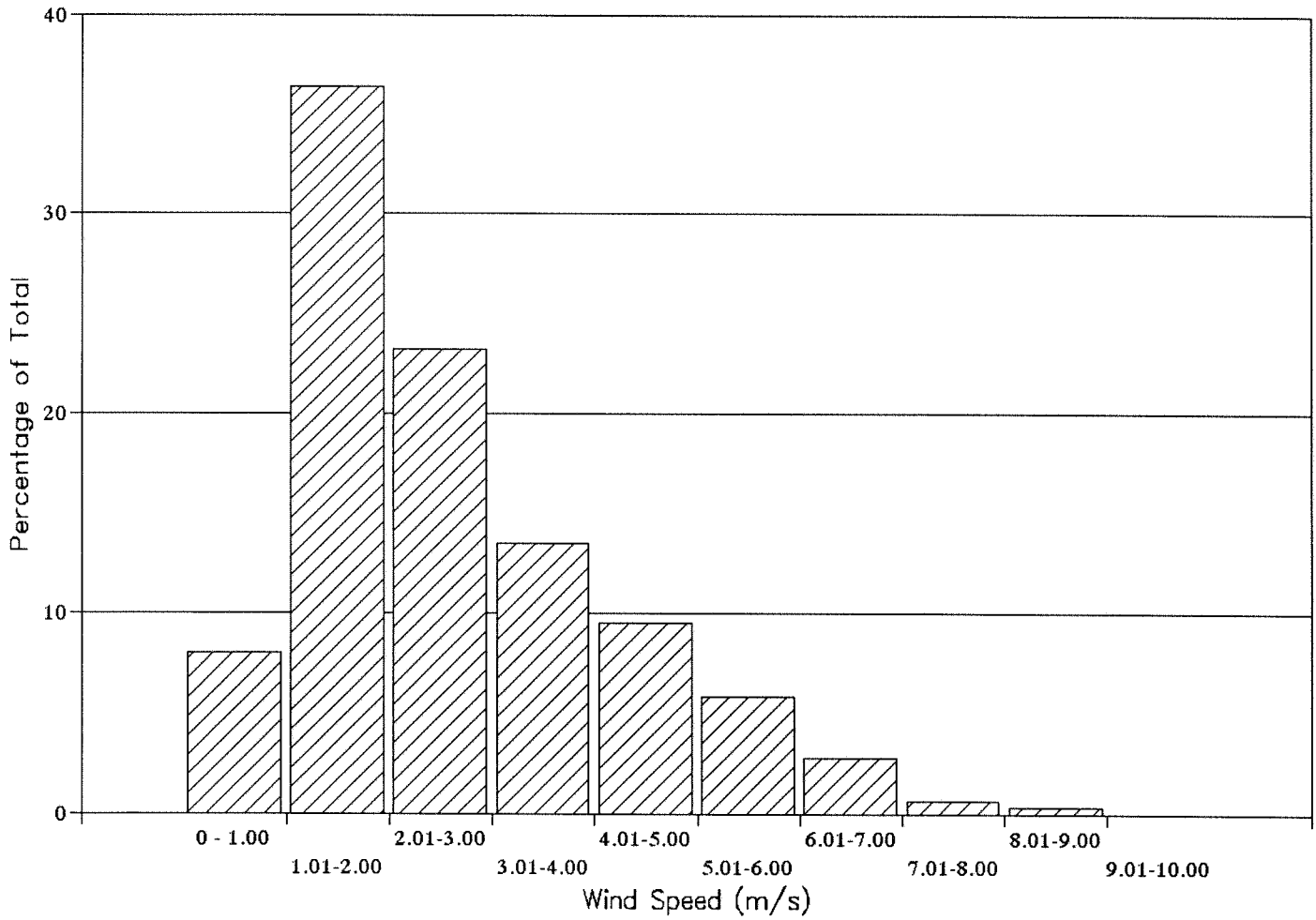
BINS	RANGES	FREQUENCY	% of TOTAL
1	0 - 1.00	26	7.95
2	1.01 - 2.00	119	36.39
3	2.01 - 3.00	76	23.24
4	3.01 - 4.00	44	13.46
5	4.01 - 5.00	31	9.48
6	5.01 - 6.00	19	5.81
7	6.01 - 7.00	9	2.75
8	7.01 - 8.00	2	0.61
9	8.01 - 9.00	1	0.31
10	9.01 - 10.00	0	0.00
Total =		327	100

Cummulative frequency distribution for hourly wind speed

Wind speed ( $m\ s^{-1}$ )	Cummulative frequency	Cummulative % of Total
Less than 1.01	26	7.95
Less than 2.01	145	44.34
Less than 3.01	221	67.58
Less than 4.01	265	81.04
Less than 5.01	296	90.52
Less than 6.01	315	96.33
Less than 7.01	324	99.08
Less than 8.01	327	99.69
Less than 9.01	327	100.00
Less than 10.01	327	100.00

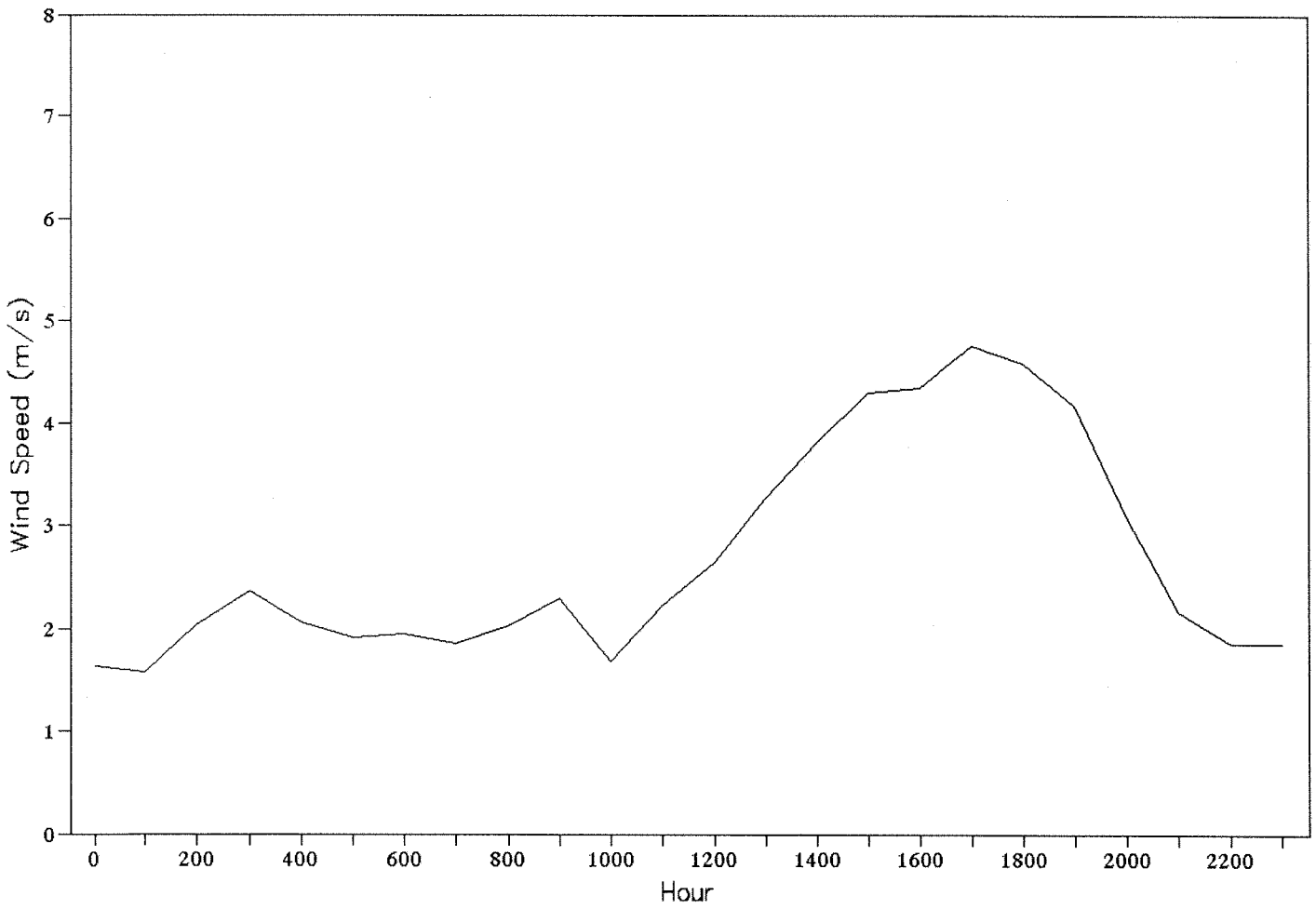
# Frequency Distribution for Wind Speed

Chile 1987 - Ridge



# Diurnal Cycle of Wind Speed

Chile 1987 - Ridge



File: ER7HRWD.WQ1

Chile 1987 - Ridge

Hourly Wd data

Period: October 31 - November 14

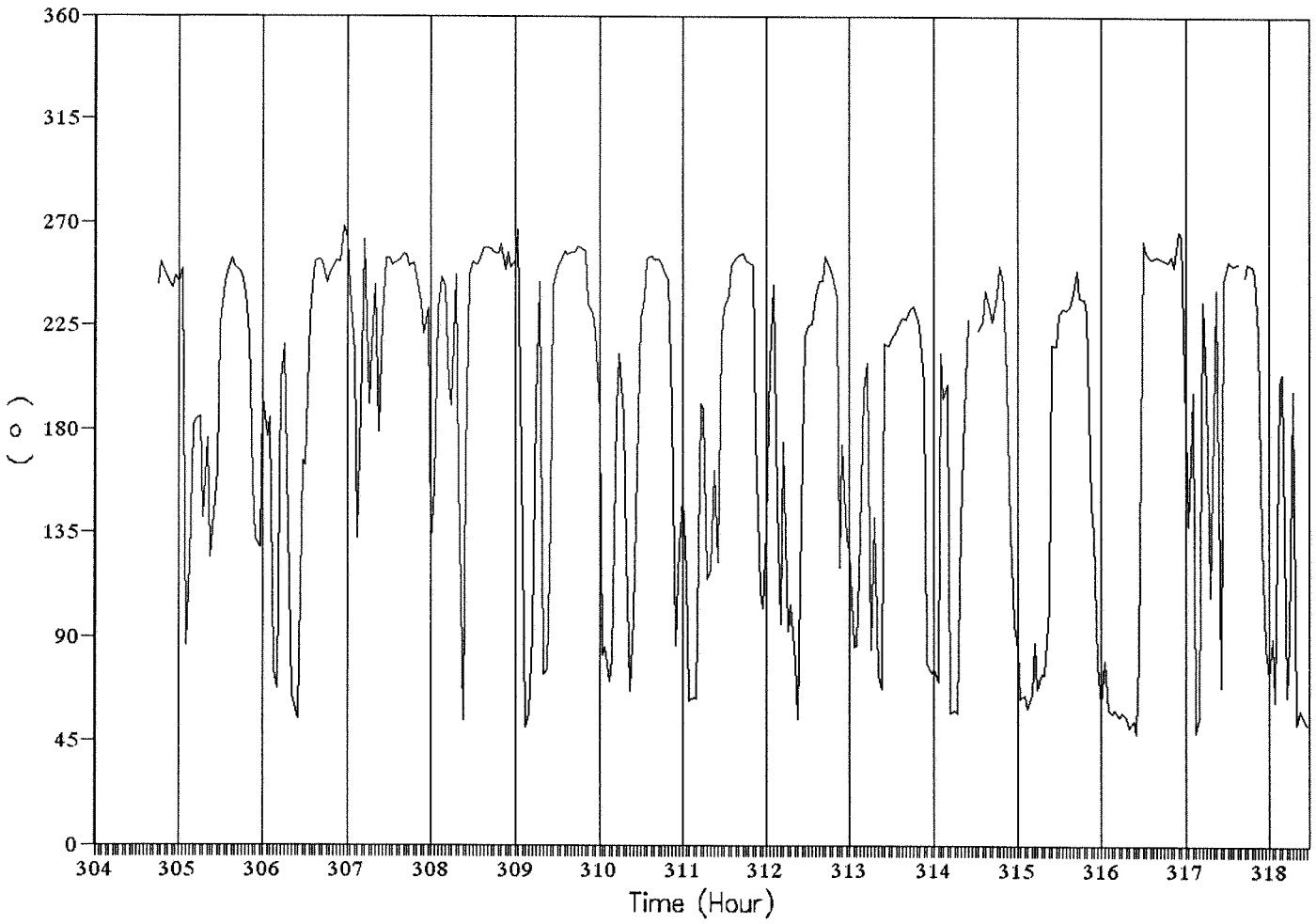
<u>Wind Direction</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100	250	177	241	154	267	82	117	209	85	70	63	80	138	90	
200	86	185	213	232	129	85	62	243	86	213	65	59	196	62	
300	122	75	133	246	50	71	64	148	134	193	59	57	49	201	
400	181	67	209	242	57	80	63	95	197	199	66	58	56	204	
500	184	201	263	199	91	189	191	174	209	57	87	55	236	64	
600	186	217	191	190	190	213	189	92	84	58	67	57	199	88	
700	141	138	215	247	244	185	115	104	142	57	74	56	107	197	
800	176	64	243	160	74	126	118	79	73	139	74	50	182	52	
900	124	58	179	54	76	66	162	54	67	187	103	54	241	58	
1000	136	54	229	166	141	98	122	171	218	228	217	48	69	55	
1100	162	166	255	247	242	163	220	221	217		216	82	245	52	
1200	225	164	255	252	251	228	232	225	219		230	262	253		
1300	243	228	251	252	252	236	239	226	223	223	233	257	252		
1400	248	242	253	254	258	254	251	238	226	227	232	254	251		
1500	255	252	253	259	256	255	254	245	228	240	233	255	252		
1600	251	254	256	259	257	254	255	244	227	232	240	255			
1700	249	252	256	258	257	254	256	255	232	227	249	255	247		
1800	247	243	251	257	259	252	253	250	233	238	237	254	252		
1900	239	247	252	257	258	248	253	247	229	251	237	253	252		
2000	220	251	246	261	257	245	251	237	225	243	231	255	247		
2100	156	253	235	249	234	189	178	120	200	202	147	251	221		
2200	132	253	222	257	230	86	109	174	78	137	134	267	132		
2300	128	269	232	250	222	129	103	132	74	96	78	265	86		
0	194	263	130	253	187	150	137	128	76	85	61	183	72		
Daily Average:	246	189	227	227	197	173	175	180	166	173	151	163	184	102	

Ridge - 1987

Average:	183	Maximum Daily Average:	246
Maximum:	269	Minimum Daily Average:	102
Minimum:	48		
Std.Dev:	73		

# Wind Direction

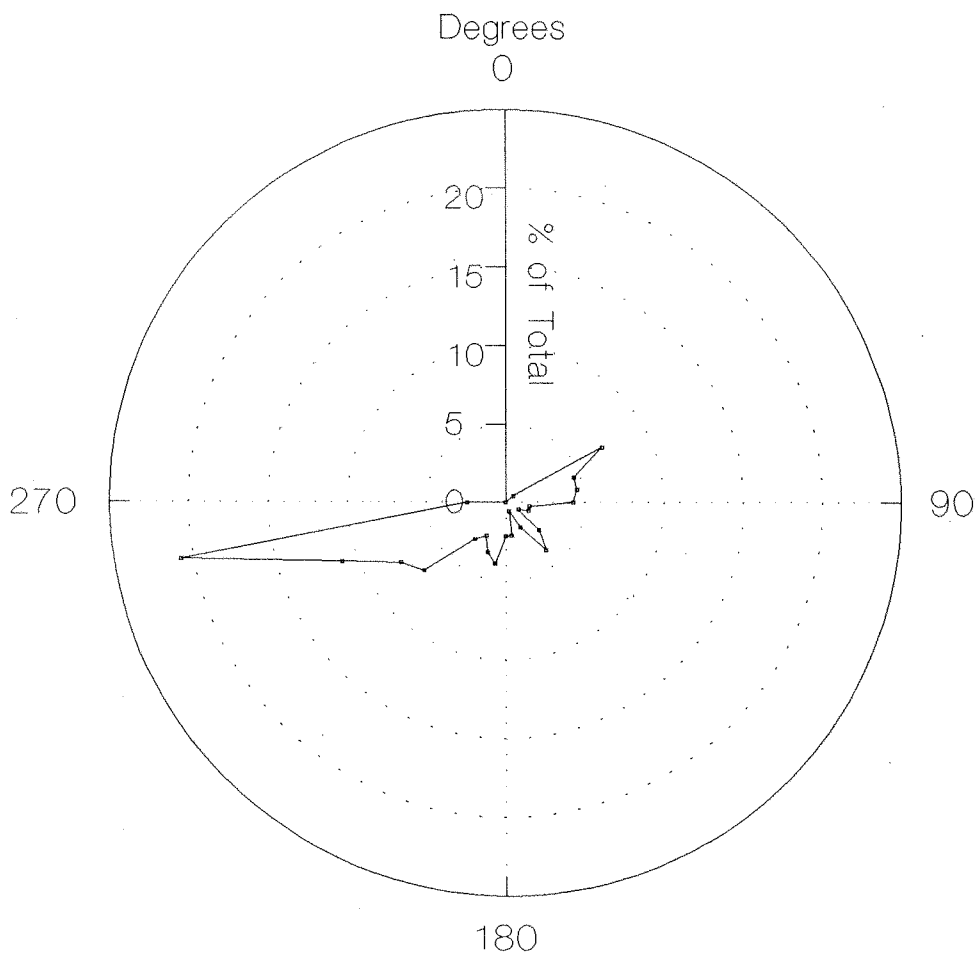
## Chile 1987 - Ridge



Wind Direction Frequency Distribution

CHILE RIDGE 1987

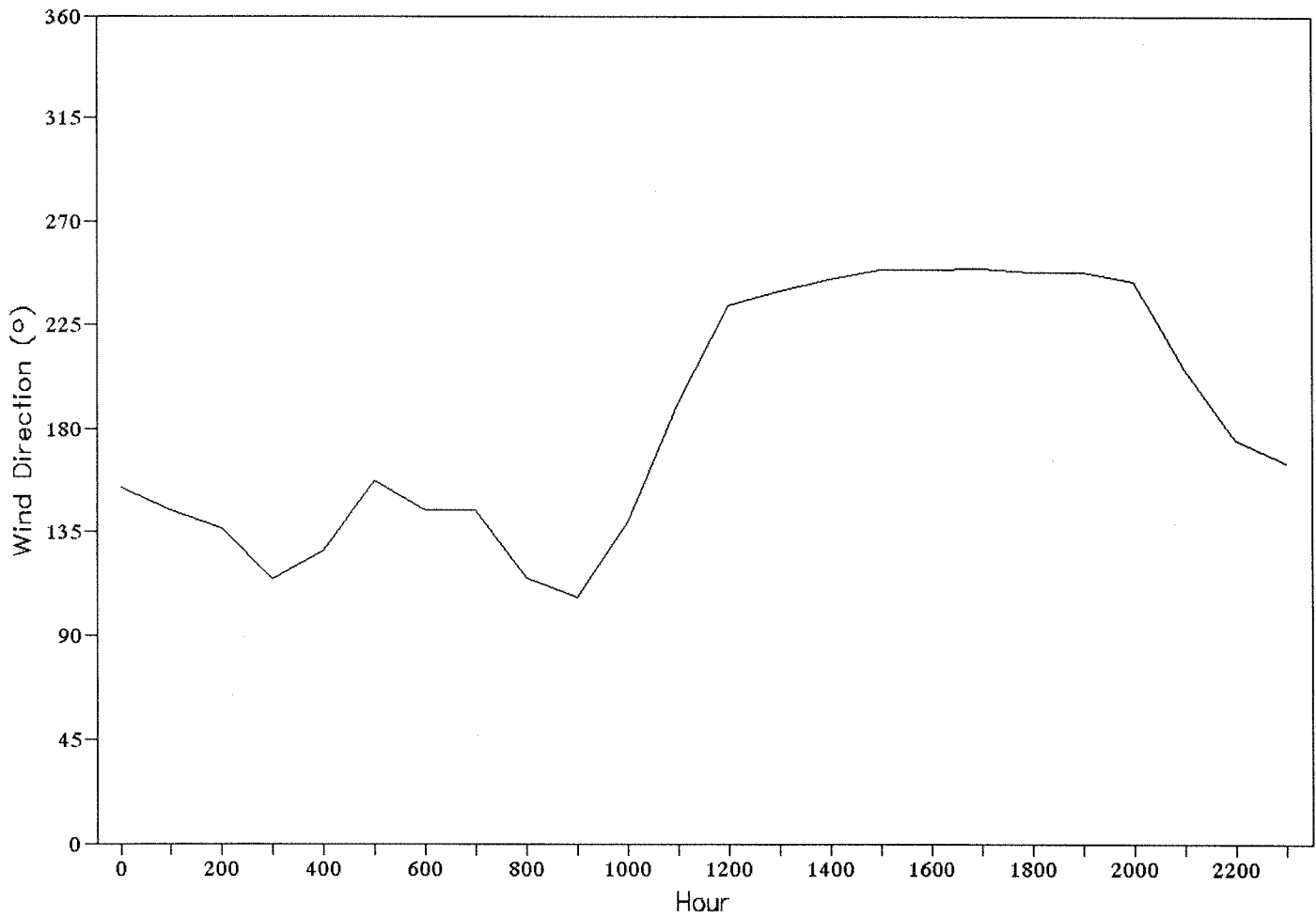
Degrees	Counts	% of Total	Direction	Degrees	Counts	% of Total
10	0	0.00	NE	45	0	0.00
20	0	0.00	E	90	69	21.10
30	0	0.00	SE	135	29	8.87
40	0	0.00	S	180	28	8.56
50	2	0.61	SW	225	52	15.90
60	23	7.03	W	270	149	45.57
70	15	4.59	NW	315	0	0.00
80	15	4.59	N	360	0	0.00
90	14	4.28			0	
100	5	1.53		Sum:	327	100
110	5	1.53				
120	3	0.92				
130	9	2.75				
140	13	3.98				
150	6	1.83				
160	2	0.61				
170	7	2.14				
180	7	2.14				
190	13	3.98				
200	11	3.36				
210	8	2.45				
220	10	3.06				
230	22	6.73				
240	25	7.65				
250	36	11.01				
260	68	20.80				
270	8	2.45				
280	0	0.00				
290	0	0.00				
300	0	0.00				
310	0	0.00				
320	0	0.00				
330	0	0.00				
340	0	0.00				
350	0	0.00				
360	0	0.00				
	0					
Sum:	327	100				



Chile 1987 - Ridge, Frequency distribution for wind direction (Systat filename: ER7WD1.SYS)

# Diurnal Variation of Wind Direction

1987 Ridge - El Tofo, Chile



**FILE: ER7HRMP.WQ1**

**CHILE 1987 - Ridge**

Hourly T/RH/R/p data

Period: October 31 - November 14

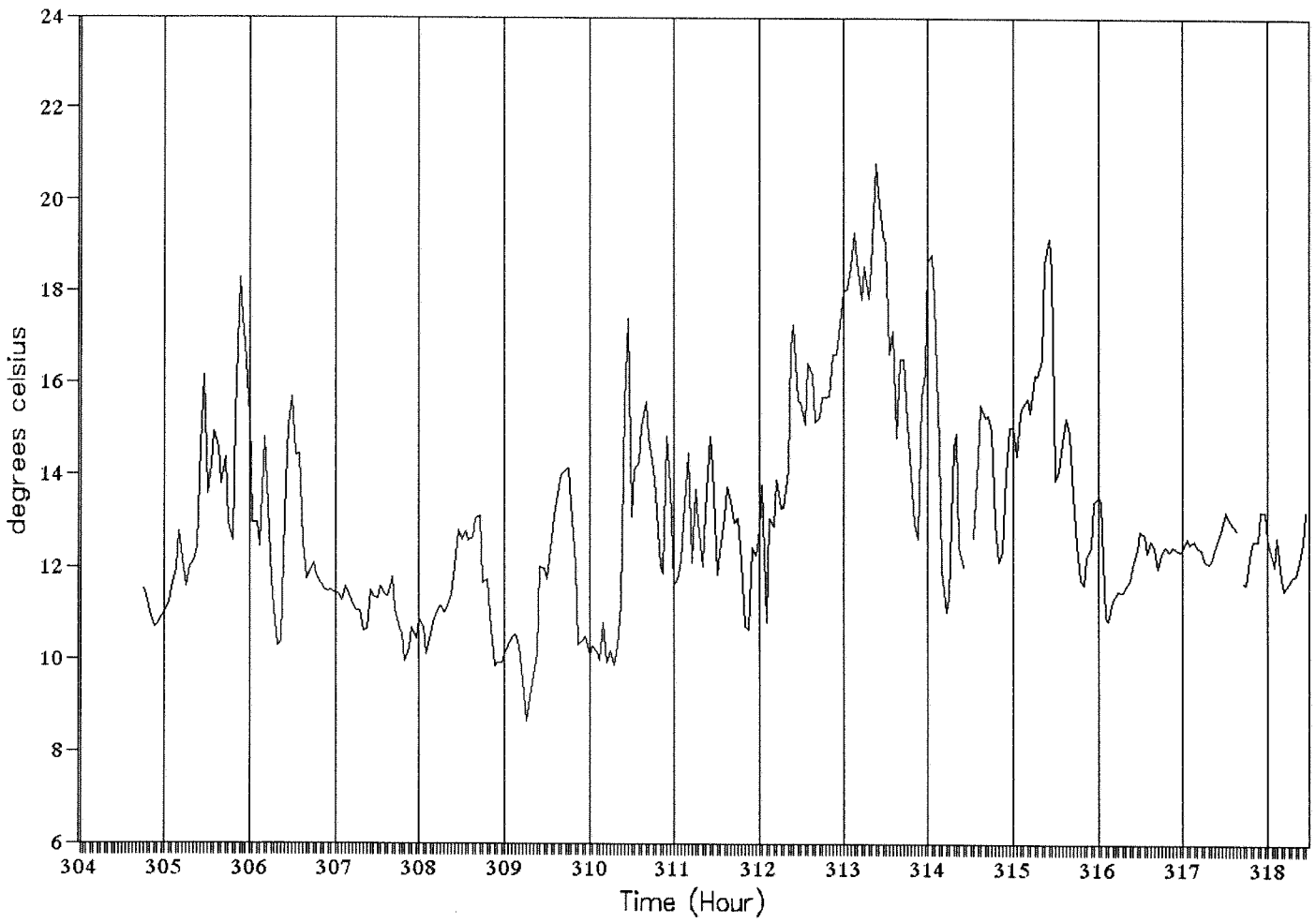
<u>Temperature</u> <u>TIME/JD</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100		11.3	13.0	11.4	10.7	10.3	10.3	11.7	13.8	18.1	18.8	14.4	13.4	12.7	12.3
200		11.5	13.0	11.3	10.1	10.5	10.2	12.1	10.8	18.6	17.8	15.3	10.9	12.5	12.0
300		12.0	12.4	11.6	10.5	10.5	10.0	13.4	13.1	19.3	14.7	15.5	10.8	12.6	12.7
400		12.8	14.8	11.4	10.8	10.3	10.8	14.5	12.9	18.7	12.0	15.7	11.3	12.5	11.8
500		12.1	13.8	11.2	11.0	9.5	9.9	12.1	13.9	17.8	11.0	15.4	11.4	12.4	11.5
600		11.6	11.7	11.1	11.2	8.6	10.2	13.7	13.3	18.6	11.4	16.2	11.5	12.2	11.7
700		12.0	11.1	11.1	11.0	9.1	9.9	13.0	13.3	17.9	14.6	16.1	11.5	12.1	11.8
800		12.1	10.3	10.6	11.2	9.6	10.3	12.0	14.1	18.6	14.9	16.5	11.6	12.2	11.9
900		12.4	10.4	10.7	11.4	10.1	11.2	13.2	16.8	20.8	12.5	18.6	11.7	12.4	12.1
1000		14.6	13.1	11.5	12.0	12.0	15.5	14.8	17.3	20.2	12.0	19.2	12.0	12.7	12.6
1100		16.1	15.1	11.4	12.8	12.0	17.4	14.2	15.6	19.2		18.5	12.4	12.9	13.2
1200		13.6	15.7	11.3	12.6	11.7	13.1	11.8	15.6	19.1		13.9	12.8	13.2	
1300		14.2	14.4	11.6	12.8	12.6	14.1	12.4	15.1	16.6	12.6	14.1	12.7	13.0	
1400		14.9	14.4	11.4	12.6	13.1	14.3	13.1	16.4	17.2	14.4	14.7	12.4	12.9	
1500		14.5	12.5	11.4	12.7	13.7	15.0	13.8	16.2	14.8	15.5	15.2	12.6	12.8	
1600		13.8	11.7	11.8	13.0	14.0	15.6	13.5	15.2	16.5	15.3	14.9	12.4		
1700		14.4	11.9	11.1	13.1	14.1	14.8	13.0	15.2	16.5	15.3	13.6	12.0	11.7	
1800	11.5	12.9	12.1	10.6	11.6	14.1	14.1	13.1	15.7	15.1	15.0	12.5	12.3	11.7	
1900	11.3	12.6	11.8	10.5	11.7	13.4	13.6	12.1	15.7	14.0	13.0	11.8	12.5	12.4	
2000	11.0	15.3	11.6	9.9	11.0	12.0	12.0	10.7	15.7	12.9	12.1	11.6	12.4	12.6	
2100	10.7	18.3	11.5	10.2	9.8	10.3	11.9	10.7	16.6	12.6	12.4	12.2	12.5	12.6	
2200	10.7	17.4	11.5	10.7	9.9	10.4	14.8	12.4	16.6	15.7	14.0	12.5	12.4	13.2	
2300	10.9	16.9	11.5	10.4	9.9	10.5	13.7	12.2	17.3	16.2	15.0	13.4	12.4	13.2	
0	11.0	15.3	11.4	10.9	10.1	10.1	11.6	12.8	18.0	18.7	15.0	13.5	12.4	12.7	
Daily Average:	11.0	13.9	12.5	11.0	11.4	11.4	12.7	12.8	15.2	17.2	14.1	14.8	12.1	12.6	12.1

**Ridge - 1987**

Average:	13.1	Maximum Daily Average:	17.2
Maximum:	20.8	Minimum Daily Average:	11.0
Minimum:	8.6		
Std.Dev:	2.3		

# Temperature

Chile 1987 - Ridge



**FILE: ER7HRMP.WQ1**

**CHILE 1987 - Ridge**

Hourly T/RH/R/p data

Period: October 31 - November 14

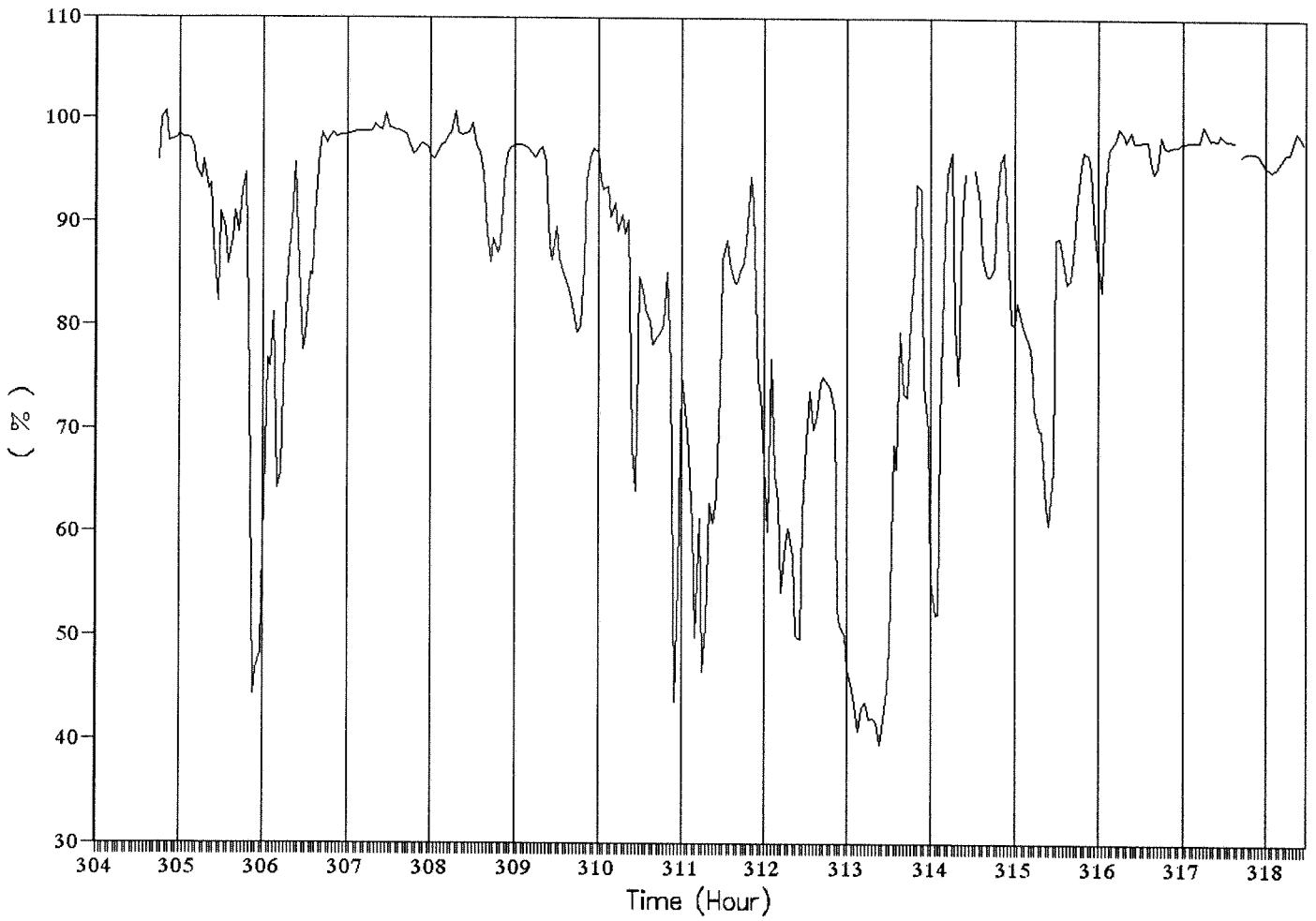
<u>Relative Humidity</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100	98.2	76.8	98.5	96.2	97.5	94.0	71.9	60.0	44.9	52.0	82.2	83.3	83.3	97.9	95.3
200	98.3	76.0	98.6	96.7	97.6	93.1	69.6	76.9	43.3	52.1	80.3	93.2	93.2	98.0	95.0
300	98.1	81.1	98.7	97.5	97.4	93.6	60.7	65.5	40.8	70.3	79.7	97.1	97.1	97.9	95.5
400	97.1	64.2	98.8	97.7	97.2	90.5	49.7	63.0	43.2	88.6	78.3	97.5	97.5	97.9	95.7
500	95.1	65.6	98.7	98.4	96.7	91.8	61.2	54.2	43.5	94.6	76.9	98.3	98.3	98.0	96.4
600	94.2	78.4	98.8	98.5	96.3	89.0	46.5	59.0	41.8	96.9	72.1	99.3	99.3	99.5	96.9
700	96.1	85.8	98.8	100.8	97.0	90.8	50.9	60.4	42.1	80.4	70.1	98.7	98.7	98.8	96.9
800	93.2	89.8	99.6	98.7	97.2	88.7	62.7	57.6	41.6	74.3	69.8	97.9	97.9	98.1	97.9
900	93.6	95.7	99.1	98.4	95.7	90.2	60.8	50.0	39.5	90.1	62.5	99.0	99.0	98.2	98.9
1000	87.7	88.4	98.9	98.6	87.6	68.3	63.6	49.5	41.0	94.8	60.6	97.9	97.9	98.1	98.4
1100	82.3	77.7	100.5	98.7	86.3	63.9	73.7	61.5	44.8		66.1	97.9	97.9	98.7	97.8
1200	90.9	78.9	99.1	99.6	89.4	84.6	86.3	68.8	48.8		88.4	97.8	97.8	98.3	
1300	89.3	85.0	99.1	97.4	86.5	83.4	88.2	73.7	68.4	95.1	88.5	97.9	97.9	98.1	
1400	85.9	84.8	98.9	96.8	84.9	81.5	86.1	69.9	66.1	92.0	86.5	98.0	98.0	98.2	
1500	88.2	90.6	98.9	94.7	84.2	80.4	84.1	71.4	79.5	86.6	84.0	96.1	96.1	98.0	
1600	91.0	96.9	98.7	88.8	83.1	78.2	84.1	74.4	73.4	84.7	84.4	95.0	95.0		
1700	88.9	98.6	98.5	86.0	81.2	79.1	85.5	75.0	73.1	84.8	87.7	95.6	95.6	96.6	
1800	93.0	97.7	97.8	88.3	79.3	79.2	86.0	74.3	80.5	85.6	91.5	98.4	98.4	96.8	
1900	94.7	98.2	96.6	87.0	79.9	80.2	88.1	74.0	85.6	91.6	95.7	97.4	97.4	97.0	
2000	100.8	74.1	96.9	88.0	85.8	85.1	94.3	71.7	93.7	95.9	97.1	97.2	97.2	97.0	
2100	97.9	44.3	97.6	95.0	94.1	75.9	91.8	52.5	93.2	96.8	96.6	97.4	97.4	96.9	
2200	98.0	46.7	97.7	96.6	96.7	43.5	74.7	50.8	74.4	88.7	95.1	97.5	97.5	96.8	
2300	98.1	48.2	97.3	97.1	97.1	55.3	73.5	50.0	70.0	80.3	89.0	97.6	97.6	96.2	
0	98.5	58.5	96.5	97.4	96.8	75.4	66.6	46.7	55.4	80.1	85.8	97.9	97.9	95.6	
Daily Average:	98.5	87.6	98.4	95.5	91.1	80.7	73.4	62.9	59.5	84.4	82.0	96.8	96.8	97.7	96.8

**Ridge - 1987**

Average:	84.9	Maximum Daily Average:	98.5
Maximum:	100.8	Minimum Daily Average:	59.5
Minimum:	39.5		
Std.Dev:	16.1		

# Relative Humidity

## Chile 1987 - Ridge

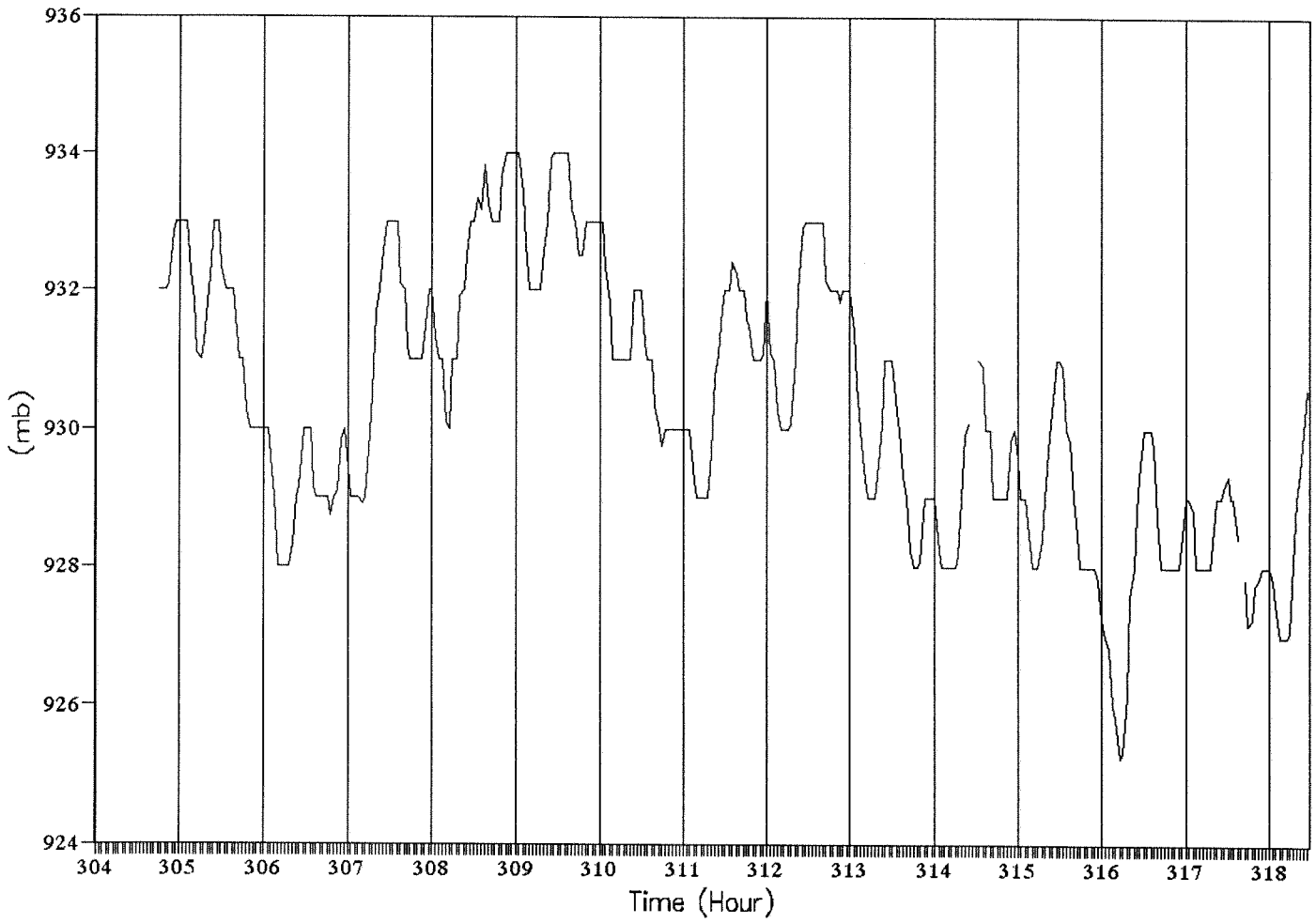


**FILE: ER7HRMP.WQ1**  
**CHILE 1987 - Ridge**  
 Hourly T/RH/R/p data  
 Period: October 31 - November 14

<u>Pressure</u>	<u>TIME/JD</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100		933	930	933	929	931	934	933	930	931	931	928	929	927	929	928
200		933	930	930	929	931	933	932	930	931	931	928	929	927	929	928
300		932	929	929	929	931	933	932	929	930	930	928	929	926	928	927
400		932	928	928	929	930	932	931	929	930	929	928	928	926	928	927
500		931	928	928	929	930	932	931	929	930	929	928	925	928	927	927
600		931	928	928	930	931	932	931	929	930	929	928	925	928	927	927
700		931	928	928	931	931	932	931	929	930	929	928	928	926	928	928
800		932	928	928	932	932	933	931	930	931	930	929	929	928	929	929
900		932	929	929	932	932	933	931	931	932	930	930	930	928	929	929
1000		933	929	929	933	933	934	932	931	933	931	930	930	929	929	930
1100		933	930	930	933	933	934	932	932	933	931	930	931	929	929	931
1200		932	930	930	933	933	934	932	932	933	931	930	931	930	929	930
1300		932	930	930	933	933	934	932	932	933	931	930	931	930	929	930
1400		932	932	929	933	933	934	931	932	933	930	931	931	930	929	930
1500		932	929	929	932	934	934	931	932	933	930	931	930	930	929	928
1600		932	929	929	932	933	933	930	932	933	929	930	930	929	928	928
1700		931	929	929	931	933	933	930	932	932	928	929	929	928	928	928
1800	932	931	929	929	931	933	933	930	932	932	928	929	929	928	927	927
1900	932	930	929	929	931	933	933	930	932	932	928	929	928	928	927	927
2000	932	930	929	929	931	933	933	930	932	932	928	929	928	928	927	927
2100	932	930	929	929	931	934	933	930	931	932	928	929	928	928	928	928
2200	933	930	930	930	931	934	933	930	931	932	929	929	928	928	928	928
2300	933	930	930	930	932	934	933	930	931	932	929	930	928	928	928	928
0	933	930	929	929	932	934	933	930	932	932	929	930	927	929	928	928
Daily Average:		932	932	929	931	933	933	931	931	932	930	929	929	928	928	928

**Ridge - 1987**  
 Average: 930 Maximum Daily Average: 933  
 Maximum: 934 Minimum Daily Average: 928  
 Minimum: 925  
 Std.Dev: 2

# Pressure Chile 1987 - Ridge



FILE: ER7HRMP.WQ1

CHILE 1987 - Ridge

Hourly T/RH/R/p data

Period: October 31 - November 14

<u>Solar Radiation</u>		305	306	307	308	309	310	311	312	313	314	315	316	317	318
<u>TIME/ID</u>	304														
100		0	1	0	0	0	0	0	0	0	0	0	0	0	0
200		0	0	0	0	0	0	0	0	0	0	0	0	0	0
300		0	0	0	0	0	0	0	0	0	0	0	0	0	0
400		0	0	0	0	0	0	0	0	0	0	0	0	0	0
500		0	0	0	0	0	0	0	0	0	1	0	0	0	0
600		0	0	0	0	0	0	0	0	0	1	0	0	0	0
700		1	2	0	1	2	2	2	3	3	5	3	1	1	2
800		57	82	14	33	50	111	97	100	105	110	111	20	24	21
900		335	311	89	107	308	389	380	378	387	285	401	73	73	85
1000		604	614	212	333	620	638	624	622	632	415	650	150	185	192
1100		798	835	237	557	752	855	838	834	844		864	205	230	352
1200		956	958	275	433	873	1015	880	995	1007		993	226	387	
1300		1063	1054	275	598	1096	1118	1044	1089	1102	956	1106	291	346	
1400		1116	1043	280	757	1105	1142	1074	1127	1137	1112	1147	520	420	
1500		725	510	281	961	1003	1112	1081	1003	1102	1096	1116	595	377	
1600		425	254	301	870	932	1005	960	835	1002	996	989	410		
1700		515	148	230	742	795	827	518	810	829	831	648	204	256	
1800	122	343	168	264	311	598	603	509	597	599	587	376	139	162	
1900	74	179	72	139	251	353	356	227	341	323	194	150	62	99	
2000	25	87	24	24	97	122	118	41	121	92	45	46	22	30	
2100	1	2	1	1	2	4	3	2	2	2	3	3	1	3	
2200	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
2300	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	
Daily															
Average:	32	300	253	109	252	359	387	345	369	382	302	359	122	113	59

**Daily maximum hourly solar radiation**

Average:	851
Maximum:	1147
Minimum:	122
Min/Max:	0.11

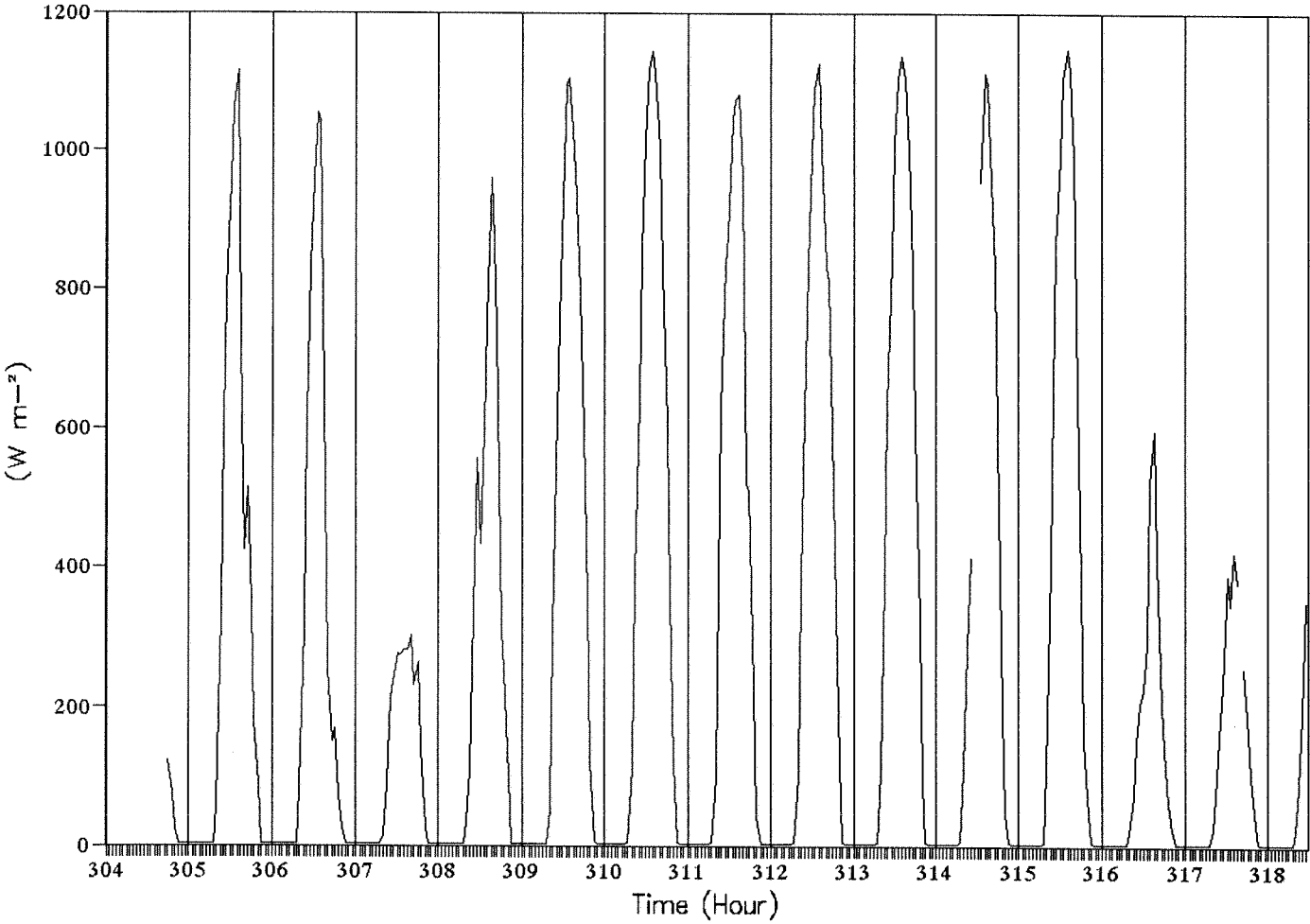
Daily															
Maximum:	122	1116	1054	301	961	1105	1142	1081	1127	1137	1112	1147	595	420	352

**Ridge - 1987**

Average:	269	Maximum Daily Average:	387
Maximum:	1147	Minimum Daily Average:	32
Minimum:	0		
Std.Dev:	370		

# Solar Radiation

Chile 1987 - Ridge



**CHILE METEOROLOGICAL DATA**

Year: 1987  
 Site: SUMMIT  
 Period: 304-318

Average and maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987:  
 (5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m\ s^{-1}$ )
Average	2.96	208	12.7	82.1	924	3.76
Maximum	9.74	344	22.4	111.6	928	12.42
Minimum	0.45	16	7.5	19.1	919	

Average and maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987 when wind direction was  $270^{\circ} \pm 20^{\circ}$ :  
 (5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m\ s^{-1}$ )
Average	4.41	270	12.4	86.4	924	5.42
Maximum	9.74	290	21.5	111.6	928	12.42
Minimum	0.45	250	7.5	33.2	919	

**CHILE METEOROLOGICAL DATA**Year: 1987Site: SUMMITPeriod: 304-318

Hourly average and hourly maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987:

(from 5 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )	Hourly Peak Gust ( $m\ s^{-1}$ )
Average	2.96	208	12.7	82.1	924	251	3.76
Maximum	9.30	287	21.6	101.4	928	1133	11.50
Minimum	0.51	54	7.6	24.0	919	0	

Hourly average and hourly maximum/minimum of the meteorological parameters for  
October 31 - November 14, 1987 when wind direction was  $270^{\circ} \pm 20^{\circ}$ :

(from 5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )	Hourly Peak Gust ( $m\ s^{-1}$ )
Average	4.55	269	12.3	86.9	924	433	5.59
Maximum	9.30	287	19.6	101.4	928	1133	11.50
Minimum	0.81	250	7.6	35.4	921	0	

**File: ES7HRWS.WQ1**

**Chile 1987 - Summit**

Hourly Ws data

Period: October 31 - November 14

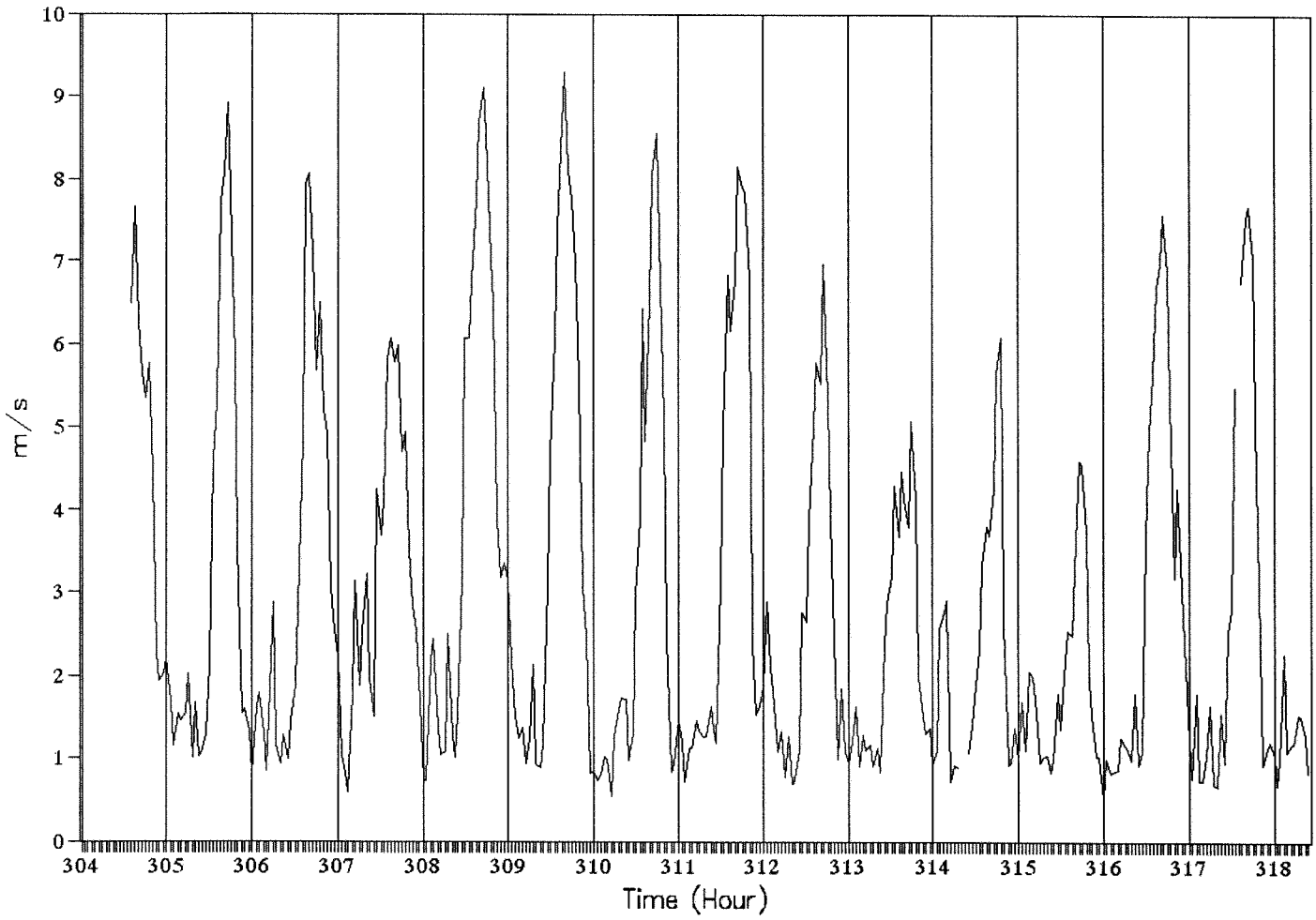
<u>Wind Speed</u> TIME/JD	304	305	306	207	208	309	310	311	312	313	314	315	316	317	318
100		1.68	1.63	1.04	0.72	2.16	0.72	1.19	2.87	1.20	1.09	1.68	0.99	0.76	0.68
200		1.14	1.77	0.82	2.16	1.49	0.79	0.71	2.10	1.63	2.56	1.09	0.80	1.78	0.99
300		1.54	1.30	0.58	2.42	1.22	1.02	1.13	1.64	0.89	2.69	2.05	0.83	0.73	2.25
400		1.45	0.85	1.79	1.35	1.36	0.98	1.12	1.08	1.29	2.89	1.99	0.86	0.73	1.08
500		1.54	1.48	3.11	1.03	0.93	0.53	1.45	1.31	1.08	0.70	1.56	1.25	1.03	1.16
600		2.01	2.85	1.87	1.07	1.23	1.26	1.31	0.77	1.15	0.91	0.94	1.13	1.64	1.17
700		1.00	1.14	2.52	2.50	2.12	1.58	1.25	1.26	0.90	0.88	1.03	1.08	0.69	1.53
800		1.65	0.93	3.20	1.26	0.92	1.73	1.26	0.69	1.12		1.03	0.96	0.66	1.50
900		1.02	1.27	1.94	0.99	0.88	1.72	1.62	0.73	0.83		0.82	1.79	1.53	1.26
1000		1.11	0.99	1.49	1.54	1.17	0.97	1.33	1.10	2.35	1.06	0.99	0.91	0.95	0.83
1100		1.30	1.46	4.24	3.15	3.06	1.30	1.18	2.76	2.85	1.40	1.79	1.07	2.51	
1200		2.11	1.87	3.68	6.05	4.67	2.97	3.08	2.63	3.20	1.88	1.35	3.68	2.78	
1300		4.58	2.80	4.11	6.06	6.06	3.88	4.99	3.88	4.29	2.31	2.18	4.93	5.46	
1400	6.48	5.29	4.84	5.81	6.76	7.40	6.42	6.82	5.00	3.67	3.31	2.52	5.62		
1500	7.67	7.72	7.95	6.06	7.76	8.65	4.83	6.14	5.78	4.46	3.81	2.47	6.69	6.74	
1600	6.27	8.08	8.06	5.79	8.69	9.30	6.51	6.78	5.52	4.11	3.68	3.27	6.98	7.51	
1700	5.64	8.91	7.09	5.97	9.11	8.11	8.04	8.15	6.97	3.78	4.24	4.59	7.57	7.67	
1800	5.36	7.28	5.68	4.68	8.54	7.74	8.55	7.89	5.35	5.06	5.64	4.53	6.87	7.03	
1900	5.77	5.82	6.50	4.93	7.02	6.98	7.26	7.86	3.89	4.11	6.07	3.73	5.34	5.08	
2000	4.42	3.56	5.18	3.50	6.48	5.55	5.09	6.76	2.45	2.00	2.67	1.94	3.17	2.38	
2100	2.26	1.53	4.91	2.82	3.88	3.07	2.45	2.38	0.99	1.48	0.91	1.52	4.26	0.92	
2200	1.91	1.60	3.04	2.51	3.17	2.45	0.83	1.53	1.83	1.30	0.95	1.02	3.03	1.12	
2300	2.01	1.31	2.54	1.95	3.35	0.81	0.93	1.64	1.08	1.37	1.36	1.01	2.40	1.19	
0	2.20	0.82	2.22	0.72	3.14	0.85	1.47	1.85	0.96	0.92	0.99	0.51	1.21	1.04	
Daily Average:	4.54	3.09	3.26	3.13	4.09	3.67	2.99	3.31	2.61	2.29	2.36	1.90	3.06	2.69	1.24

**Summit - 1987**

Average:	2.96	Maximum Daily Average:	4.54
Maximum:	9.30	Minimum Daily Average:	1.24
Minimum:	0.51		
Std.Dev:	2.30		

# Wind Speed

Chile 1987 - Summit



**CHILE 1987 METEOROLOGICAL DATA**Site: SUMMITPeriod: October 31 - November 14, 1987 (JD:304-318)Frequency distribution for hourly wind speed ( $m\ s^{-1}$ )

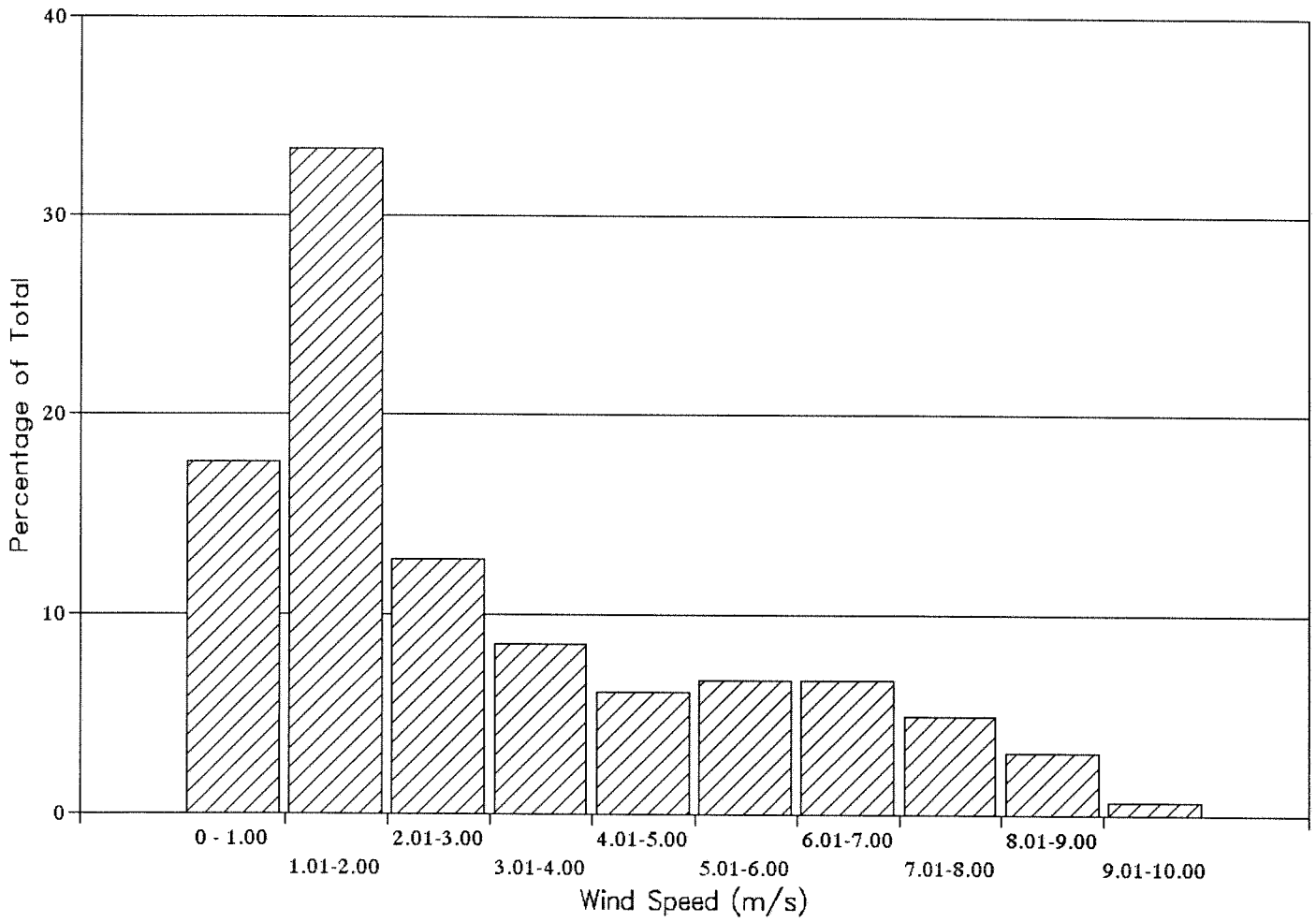
BINS	RANGES	FREQUENCY	% of TOTAL
1	0 - 1.00	58	17.58
2	1.01 - 2.00	110	33.33
3	2.01 - 3.00	42	12.73
4	3.01 - 4.00	28	8.48
5	4.01 - 5.00	20	6.06
6	5.01 - 6.00	22	6.67
7	6.01 - 7.00	22	6.67
8	7.01 - 8.00	16	4.85
9	8.01 - 9.00	10	3.03
10	9.01 - 10.00	2	0.61
Total =		330	100

Cummulative frequency distribution for hourly wind speed

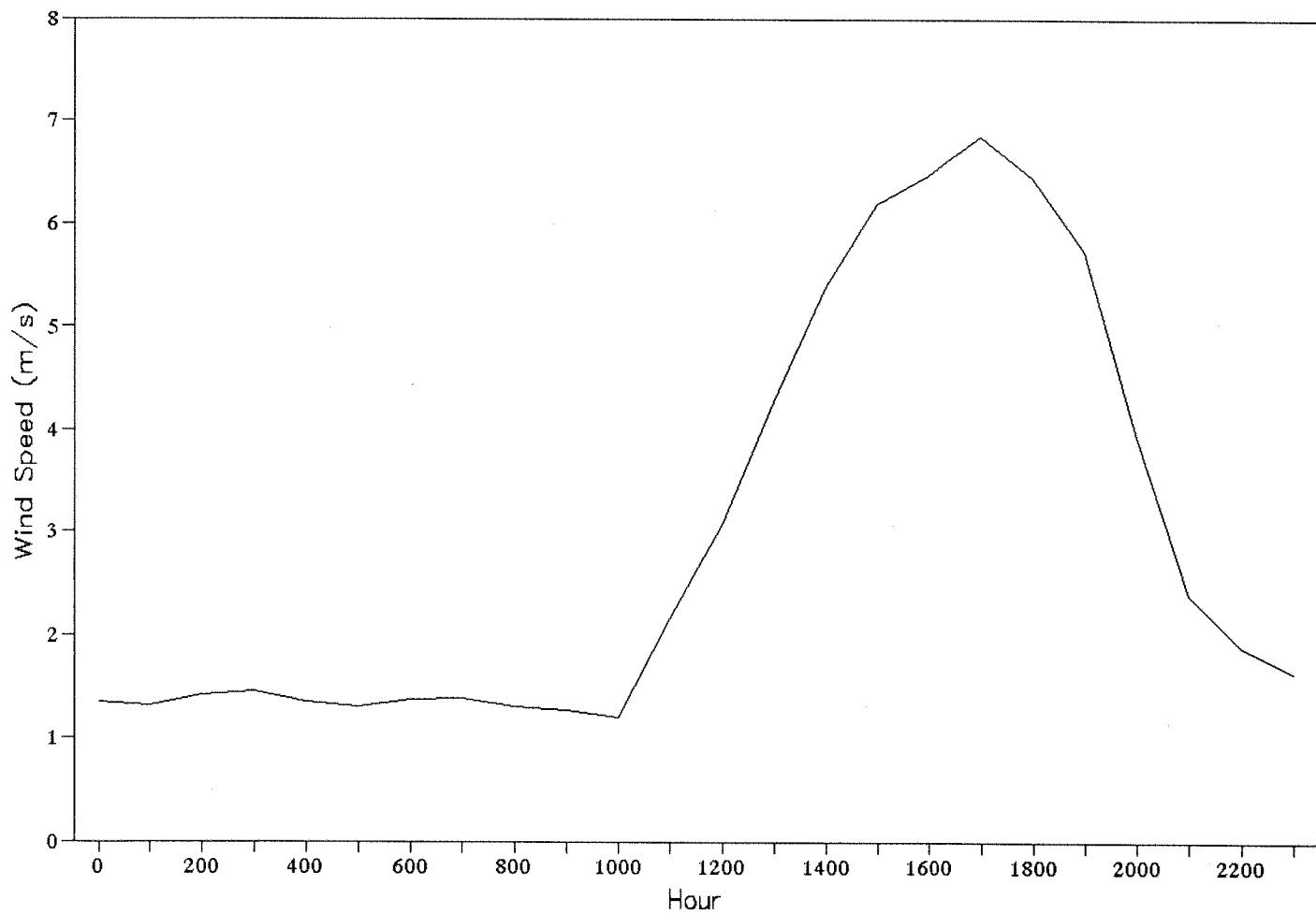
Wind speed ( $m\ s^{-1}$ )	Cummulative frequency	Cummulative % of Total
Less than 1.01	58	17.58
Less than 2.01	168	50.91
Less than 3.01	210	63.64
Less than 4.01	238	72.12
Less than 5.01	258	78.18
Less than 6.01	280	84.85
Less than 7.01	302	91.52
Less than 8.01	318	96.36
Less than 9.01	328	99.39
Less than 10.01	330	100.00

# Frequency Distribution of Wind Speed

Chile 1987 - Summit



# Diurnal Cycle of Wind Speed Chile 1987 - Summit



**File: ES7HRWD.WQ1**  
**Chile 1987 - Summit**

Hourly Wd data

Period: October 31 - November 14

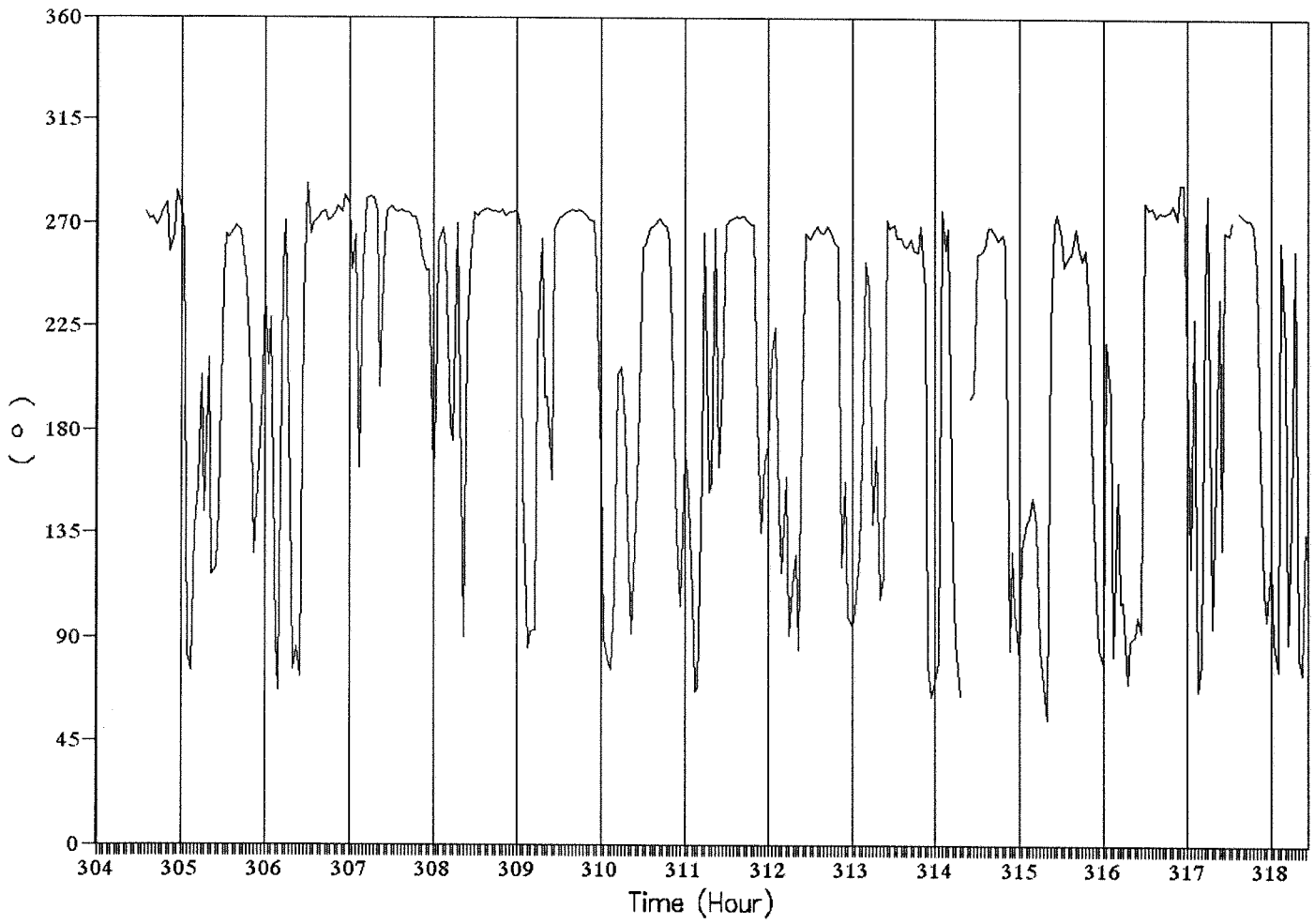
<u>Wind Direction</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
TIME/JJD															
100		265	208	250	191	267	89	161	214	102	79	128	218	121	89
200		82	229	264	261	157	78	109	225	126	276	140	195	229	75
300		75	88	163	267	85	75	66	145	169	258	142	82	67	262
400		137	67	251	258	92	109	68	118	253	267	150	158	79	215
500		156	250	280	181	93	205	162	159	242	122	140	105	239	88
600		204	271	281	175	214	208	265	91	138	88	86	106	283	141
700		143	185	281	270	263	183	153	118	173	65	69	70	94	258
800		211	75	275	193	194	121	157	125	106		54	89	135	81
900		117	86	199	90	194	91	268	84	116		225	90	238	74
1000		120	72	263	222	158	141	164	219	271	194	270	99	128	135
1100		146	235	275	255	268	172	199	266	268	196	274	92	267	
1200		245	287	277	275	272	259	270	263	270	256	265	280	265	
1300		265	265	276	273	273	261	271	266	264	258	251	276	271	
1400	274	264	270	275	275	274	267	272	269	264	260	256	277		
1500	271	267	272	276	276	275	268	273	266	261	268	256	274	275	
1600	273	269	274	275	276	276	269	273	266	260	268	268	275	273	
1700	269	267	275	274	275	275	272	273	269	263	265	261	274	272	
1800	271	257	271	273	275	276	270	271	266	258	263	254	274	272	
1900	275	244	272	272	274	274	269	269	261	258	265	258	276	269	
2000	279	205	274	266	276	273	261	270	260	269	260	230	278	250	
2100	258	125	277	256	273	272	200	186	120	241	84	157	272	167	
2200	265	156	274	249	275	271	134	135	157	78	127	106	287	111	
2300	284	186	282	250	275	251	103	166	98	64	101	85	287	97	
0	276	238	278	159	276	165	169	174	95	71	80	78	209	123	
Daily															
Average:	272	193	222	257	247	225	186	203	193	199	196	183	202	197	142

**Summit - 1987**

Average:	208	Maximum Daily Average:	272
Maximum:	287	Minimum Daily Average:	142
Minimum:	54		
Std.Dev:	74		

# Wind Direction

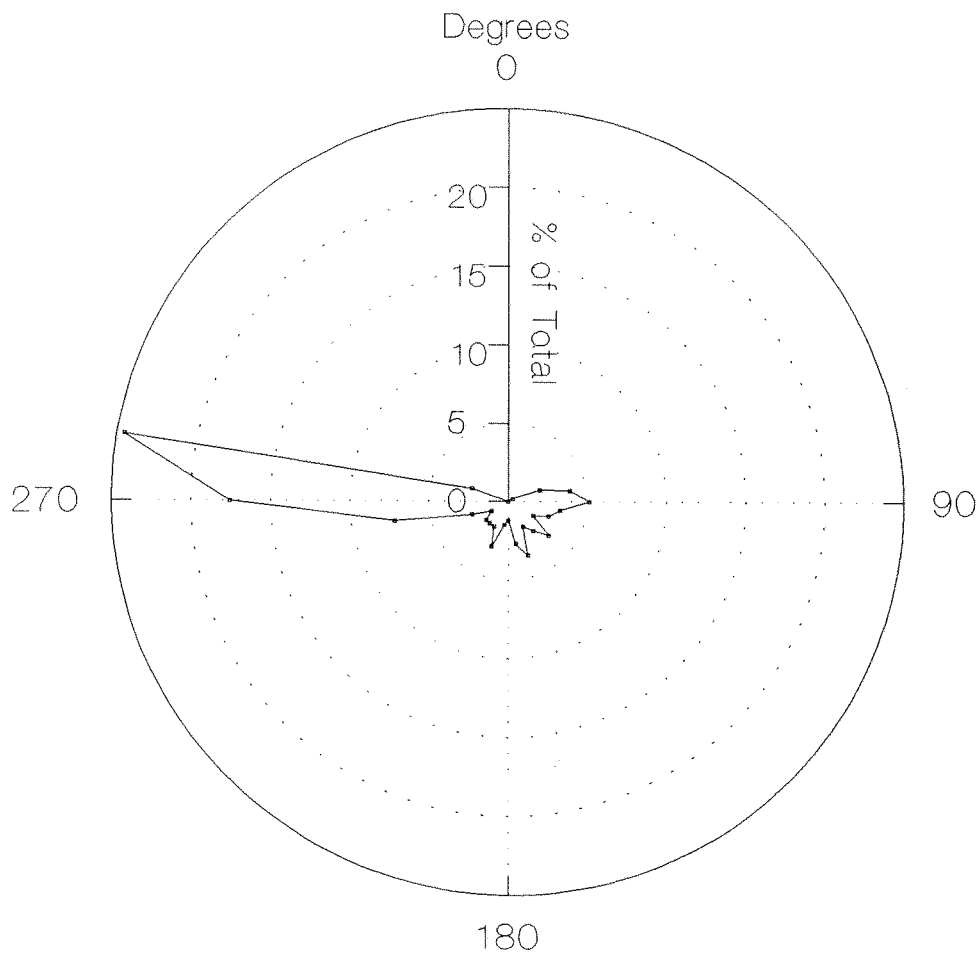
Chile 1987 - Summit



Wind Direction Frequency Distribution

CHILE SUMMIT 1987

Degrees	Counts	% of Total	Direction	Degrees	Counts	% of total
10	0	0.00	NE	45	0	0.00
20	0	0.00	E	90	38	11.52
30	0	0.00	SE	135	41	12.42
40	0	0.00	S	180	35	10.61
50	0	0.00	SW	225	30	9.09
60	1	0.30	W	270	97	29.39
70	7	2.12	NW	315	89	26.97
80	13	3.94	N	360	0	0.00
90	17	5.15			0	
100	11	3.33				
110	9	2.73		Sum:	330	100
120	6	1.82				
130	11	3.33				
140	8	2.42				
150	6	1.82				
160	12	3.64				
170	9	2.73				
180	4	1.21				
190	5	1.52				
200	10	3.03				
210	6	1.82				
220	6	1.82				
230	6	1.82				
240	4	1.21				
250	8	2.42				
260	24	7.27				
270	58	17.58				
280	81	24.55				
290	8	2.42				
300	0	0.00				
310	0	0.00				
320	0	0.00				
330	0	0.00				
340	0	0.00				
350	0	0.00				
360	0	0.00				
	0	0.00				
Sum:	330	100				



Chile 1987 - Summit, Frequency distribution for wind direction (Systat filename: ES7WD1.SYS)

# Diurnal Variation of Wind Direction

1987 Summit - El Tofo, Chile



**FILE: ES7HRMP.WQ1**  
**Chile 1987 - Summit**  
 Hourly T/RH/R/p data  
 Period: October 31 - November 14

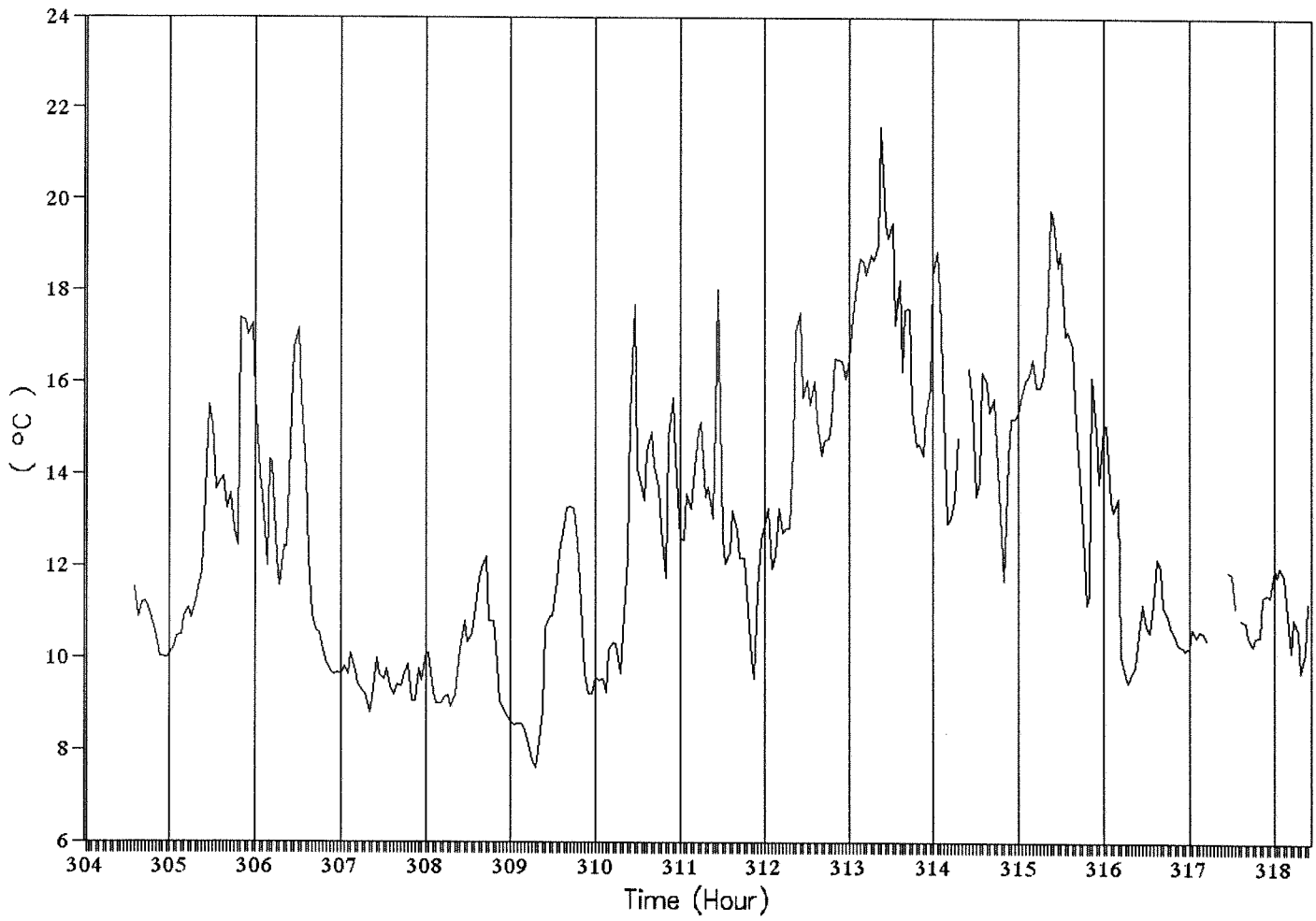
<i>Temperature</i>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
<i>TIME/JD</i>															
100		10.2	14.0	9.8	10.1	8.5	9.5	12.6	13.3	17.4	18.9	15.8	15.1	10.6	11.8
200		10.4	13.5	9.6	9.3	8.6	9.5	13.6	11.9	18.1	18.0	16.1	13.5	10.5	12.0
300		10.5	12.0	10.1	9.0	8.6	9.2	13.3	12.2	18.7	15.4	16.2	13.2	10.6	11.8
400		10.9	14.3	9.7	9.0	8.4	10.2	13.9	13.3	18.6	12.9	16.5	13.5	10.6	11.3
500		11.1	14.3	9.4	9.1	8.1	10.3	15.0	12.7	18.3	13.1	15.9	10.0	10.4	10.1
600		10.8	12.2	9.3	9.2	7.7	10.3	15.2	12.8	18.8	13.5	15.9	9.6		10.9
700		11.2	11.6	9.2	8.9	7.6	9.6	13.5	12.8	18.7	14.8	16.2	9.4		10.6
800		11.5	12.4	8.8	9.2	7.9	10.5	13.8	14.6	19.0		17.3	9.7		9.7
900		11.9	12.4	9.1	9.7	8.8	12.2	13.0	17.1	21.6		19.8	9.8		10.2
1000		13.5	15.4	10.0	10.2	10.7	15.2	15.2	17.5	19.5	16.3	19.6	10.5		11.2
1100		15.5	16.8	9.6	10.8	10.9	17.7	18.0	15.7	19.1	15.5	18.5	11.2	11.9	
1200		15.0	17.2	9.5	10.3	10.9	14.1	12.6	16.0	19.5	13.5	18.9	10.7	11.8	
1300		13.7	15.7	9.7	10.5	11.7	13.7	12.0	15.5	17.3	13.9	17.0	10.6	11.1	
1400	11.5	13.8	14.0	9.4	10.9	12.3	13.4	12.3	16.0	18.3	16.3	17.1	11.2		
1500	10.9	13.9	12.1	9.2	11.7	12.9	14.5	13.2	15.2	16.2	16.0	16.8	12.2	10.8	
1600	11.2	13.2	10.9	9.4	11.9	13.3	15.0	12.8	14.4	17.6	15.3	15.6	12.0	10.8	
1700	11.2	13.6	10.6	9.4	12.2	13.3	14.2	12.2	14.7	17.6	15.7	14.0	11.1	10.5	
1800	11.0	12.8	10.5	9.7	10.8	13.2	13.7	12.2	14.8	15.4	14.7	13.2	10.9	10.3	
1900	10.7	12.4	10.1	9.9	10.8	12.5	12.9	11.4	15.2	14.6	12.7	11.2	10.7	10.4	
2000	10.4	17.4	9.9	9.0	10.2	11.1	11.7	10.0	16.5	14.7	11.7	11.4	10.5	10.5	
2100	10.0	17.3	9.7	9.0	9.0	9.6	14.8	9.6	16.5	14.4	14.4	16.1	10.3	11.4	
2200	10.0	17.0	9.6	9.7	8.9	9.2	15.7	11.5	16.5	15.3	15.2	14.9	10.2	11.4	
2300	10.0	17.3	9.7	9.5	8.7	9.2	14.4	12.6	16.1	15.9	15.2	13.8	10.2	11.4	
0	10.0	15.7	9.6	10.1	8.6	9.6	12.6	12.9	16.5	18.3	15.3	15.0	10.3	12.0	
Daily															
Average:	10.6	13.4	12.4	9.5	10.0	10.2	12.7	13.0	14.9	17.6	14.9	16.0	11.1	10.9	11.0

**Summit - 1987**

Average:	12.7	Maximum Daily Average:	17.6
Maximum:	21.6	Minimum Daily Average:	9.5
Minimum:	7.6		
Std.Dev:	2.9		

# Temperature

## Chile 1987 - Summit



**FILE: ES7HRMP.WQ1**

**Chile 1987 - Summit**

Hourly T/RH/R/p data

Period: October 31 - November 14

<u>Relative Humidity</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100	99.5	99.5	64.4	99.5	98.7	98.3	94.6	61.1	59.2	45.1	45.8	75.5	68.4	100.0	99.7
200	99.4	99.4	67.9	99.6	98.3	98.5	94.0	49.8	66.6	43.7	47.3	73.8	77.0	100.1	99.7
300	99.4	99.4	79.6	99.5	98.6	98.7	94.5	50.4	66.2	39.9	62.5	72.7	78.8	100.1	99.7
400	99.4	99.4	60.6	99.7	98.8	98.9	90.5	45.5	58.4	41.4	78.9	68.9	74.9	100.1	99.8
500	99.3	99.3	59.3	100.1	98.9	99.0	86.4	39.0	59.7	41.2	79.7	70.2	93.7	99.4	100.1
600	99.4	99.4	71.9	99.8	98.9	99.1	84.9	35.4	56.6	39.7	77.4	69.2	96.7	91.9	100.0
700	99.3	99.3	77.8	99.9	99.1	99.2	88.4	42.9	59.5	39.5	69.7	66.0	97.4	91.3	100.0
800	99.2	99.2	75.4	100.0	98.8	99.2	86.2	47.5	54.2	39.3		64.1	97.6	90.9	100.2
900	99.2	99.2	80.9	99.9	98.8	98.7	81.5	49.7	45.8	35.9		46.8	97.8	90.5	100.2
1000	98.8	98.8	66.1	99.7	98.8	95.3	64.2	50.9	45.4	39.6	72.5	49.0	97.6	89.4	100.0
1100	94.4	94.4	63.7	100.1	98.8	90.1	56.1	48.5	54.5	41.6	78.1	57.5	97.0	97.6	
1200	87.0	87.0	66.9	99.6	99.0	91.5	77.9	80.5	58.6	42.4	89.4	63.2	96.7	100.1	
1300	88.9	88.9	75.3	99.7	98.8	88.6	81.5	87.1	66.6	56.6	89.0	69.4	97.1	101.0	
1400	87.9	87.9	82.1	99.6	98.8	86.0	81.7	86.5	65.4	52.7	75.6	69.6	96.1		
1500	88.8	88.8	90.2	99.5	98.6	85.5	79.8	83.9	70.4	66.7	75.4	71.0	92.8	100.3	
1600	99.6	91.7	98.3	99.5	95.7	83.8	77.4	84.4	75.2	59.9	79.2	75.9	92.8	99.8	
1700	99.2	90.1	98.3	99.5	89.4	81.6	78.7	86.4	76.1	60.8	78.4	82.1	96.0	99.6	
1800	99.3	92.2	98.5	99.5	90.2	79.9	78.1	87.1	76.0	75.1	82.2	85.6	99.6	99.8	
1900	99.3	91.6	98.9	99.5	88.7	80.4	80.0	89.2	74.3	80.1	90.3	94.8	101.4	100.0	
2000	99.4	55.9	99.3	99.7	88.8	87.0	83.8	95.3	63.9	81.8	95.1	96.3	100.4	100.0	
2100	99.4	43.8	100.1	99.7	95.9	94.4	38.3	95.4	48.1	76.1	86.5	74.2	101.1	99.6	
2200	99.5	45.7	99.3	99.6	97.4	96.7	24.0	77.9	47.2	71.3	77.1	73.2	99.8	99.7	
2300	99.5	44.3	99.4	99.6	97.9	97.4	39.5	65.4	50.3	68.8	76.5	78.3	100.8	99.7	
0	99.5	47.9	99.6	99.3	98.1	96.2	61.9	61.6	48.2	51.8	76.2	69.0	100.0	99.6	
Daily Average:	99.4	85.1	82.2	99.7	96.8	92.7	75.2	66.7	60.3	53.8	76.5	71.5	93.8	97.8	99.9

**Summit - 1987**

Average: 82.1 Maximum Daily Average: 99.9

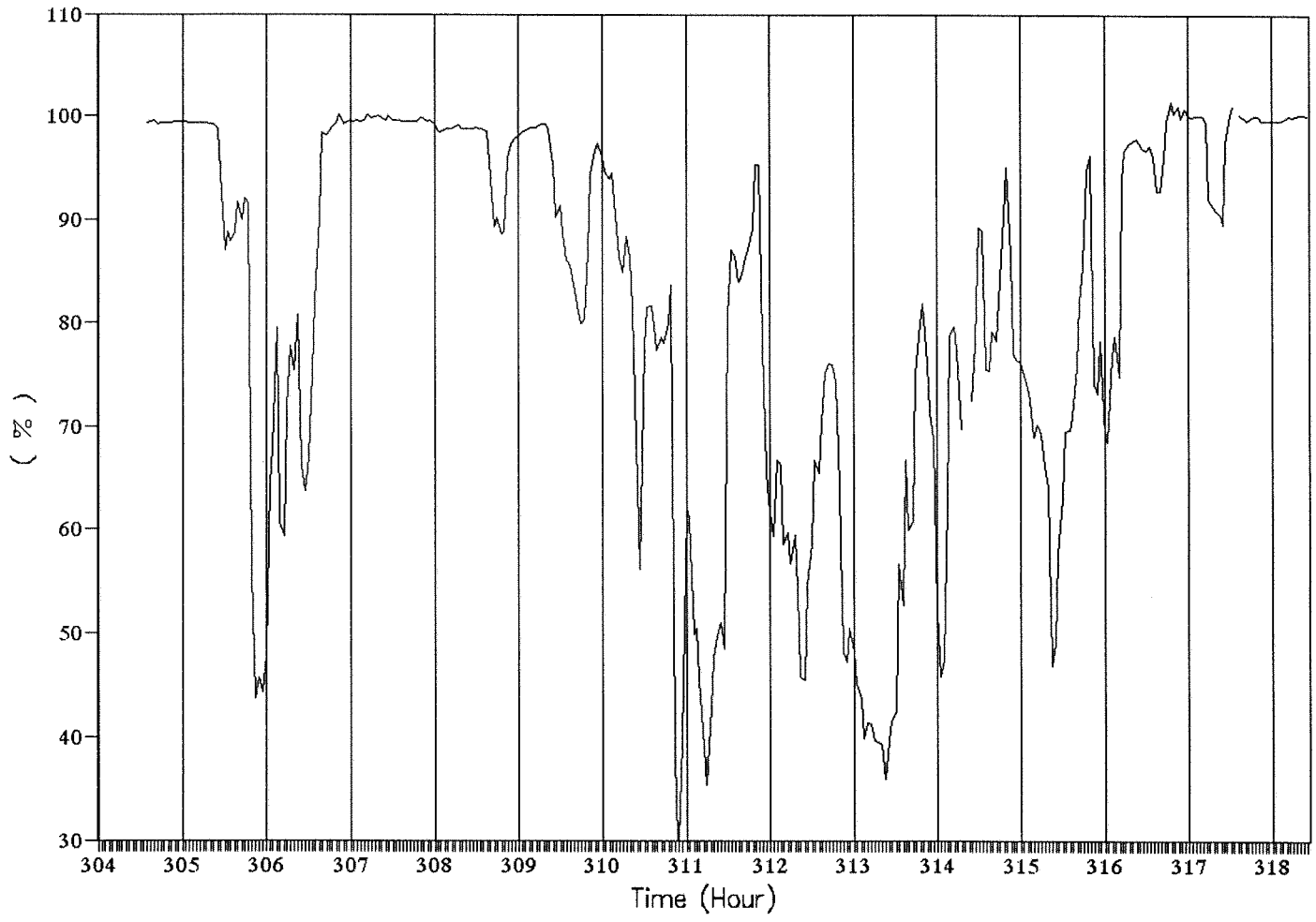
Maximum: 101.4 Minimum Daily Average: 53.8

Minimum: 24.0

Std.Dev: 19.2

# Relative Humidity

## Chile 1987 - Summit



**FILE: ES7HRMP.WQ1**  
**Chile 1987 - Summit**  
 Hourly T/RH/R/p data  
 Period: October 31 - November 14

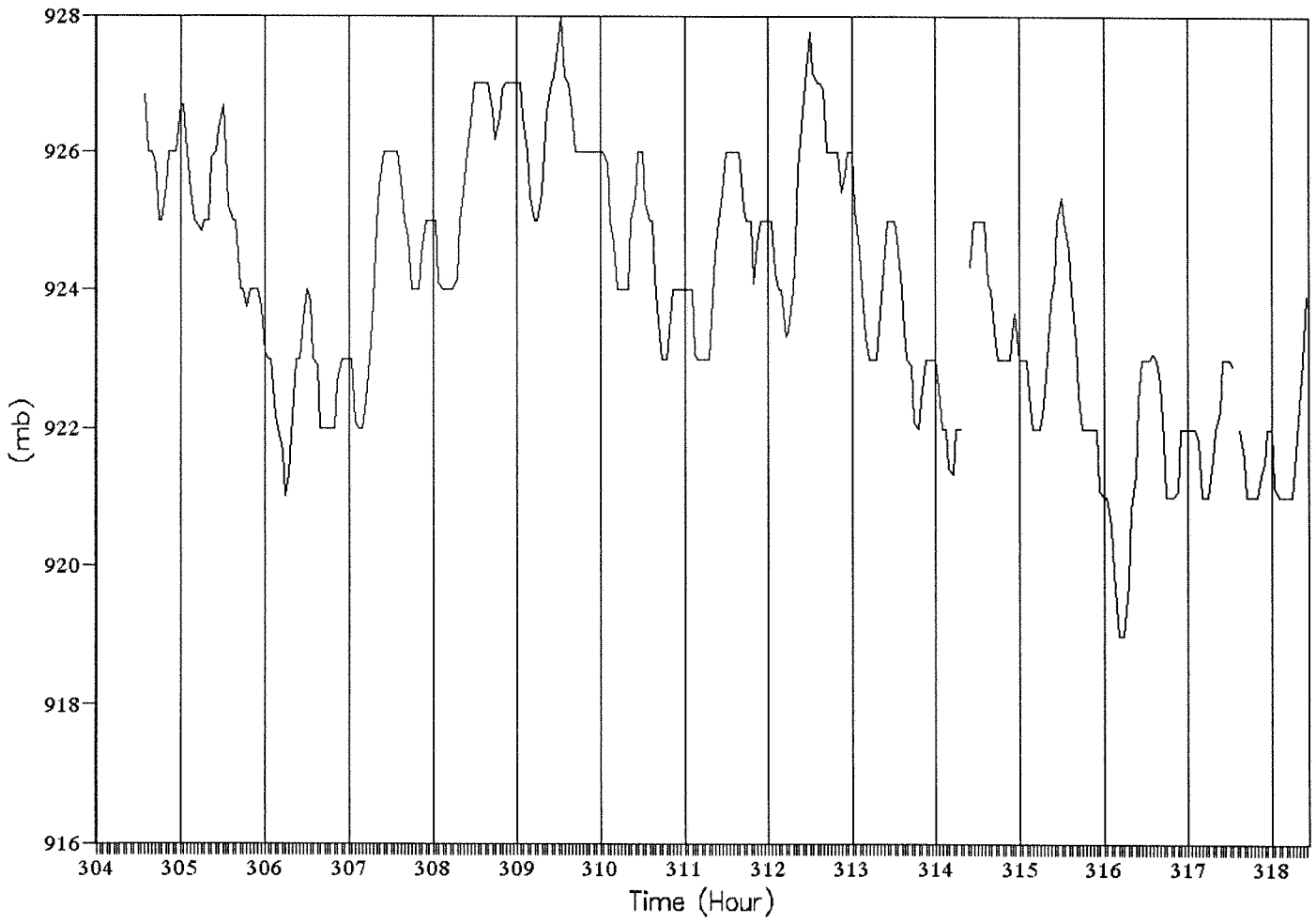
<u>Pressure</u> TIME/JD	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
100	927	926	923	923	925	927	926	924	925	925	923	923	921	922	921
200	926	925	923	922	924	927	926	924	924	925	922	923	921	922	921
300	925	925	922	922	924	926	925	923	924	924	922	923	920	922	921
400	925	925	922	922	924	925	925	923	924	923	921	922	919	921	921
500	925	925	922	922	924	925	924	923	923	923	921	922	919	921	921
600	925	925	921	923	924	925	924	923	923	923	922	922	919	921	921
700	925	925	921	924	924	925	924	923	924	923	922	922	920	922	922
800	925	925	922	925	925	926	924	924	925	924	922	923	921	922	922
900	926	926	923	926	925	927	925	925	926	924	924	924	921	922	923
1000	926	926	923	926	926	927	925	925	927	925	924	924	922	923	924
1100	926	926	924	926	926	927	926	925	927	925	925	925	923	923	923
1200	927	927	924	926	927	928	926	926	928	925	925	925	923	923	923
1300	926	926	924	926	927	928	925	926	927	925	925	925	923	923	923
1400	925	925	923	926	927	927	925	926	927	924	925	925	923	922	922
1500	925	925	923	926	927	927	925	926	927	923	924	924	923	922	922
1600	925	925	922	925	927	927	924	926	927	923	924	923	923	922	922
1700	924	924	922	925	927	926	923	925	926	923	923	923	922	921	921
1800	924	924	922	924	926	926	923	925	926	922	923	922	921	921	921
1900	924	924	922	924	927	926	923	925	926	922	923	922	921	921	921
2000	924	924	922	924	927	926	923	924	926	922	923	922	921	921	921
2100	924	924	923	925	927	926	924	925	925	923	923	922	921	921	921
2200	924	924	923	925	927	926	924	925	926	923	923	922	922	922	922
2300	924	924	923	925	927	926	924	925	926	923	924	921	922	922	922
0	923	923	923	925	927	926	924	925	926	923	923	921	922	922	922
Daily Average:	926	925	923	924	926	926	925	925	926	924	923	923	921	922	922

**Summit - 1987**

Average:	924	Maximum Daily Average:	926
Maximum:	928	Minimum Daily Average:	921
Minimum:	919		
Std.Dev:	2		

# Pressure

Chile 1987 - Summit



FILE: ES7HRMP.WQ1

Chile 1987 - Summit

Hourly T/RH/R/p data

Period: October 31 - November 14

<u>Solar Radiation</u>	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318
<u>TIME/ID</u>															
100	1	1	1	1	1	1	1	1	0	0	0	2	2	2	2
200	1	1	0	1	1	1	1	1	1	0	0	2	2	2	2
300	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
400	1	1	0	1	1	1	1	0	1	0	1	2	2	2	2
500	1	1	0	1	1	1	1	0	1	0	1	2	2	2	2
600	1	1	1	1	1	1	1	0	1	0	1	2	2	2	2
700	2	1	2	1	1	2	2	2	2	2	4	4	3	3	4
800	32	50	13	30	30	47	55	49	46	48		53	21	27	27
900	114	119	85	93	93	107	117	93	91	97		107	62	78	86
1000	209	200	208	283	283	123	102	113	110	96	306	123	161	188	207
1100	707	718	245	538	538	692	747	756	766	800	642	827	233	291	
1200	961	928	287	548	548	858	995	916	973	986	946	1008	217	590	
1300	1054	1025	281	622	622	1071	1098	1016	1069	1082	1052	1101	318	420	
1400	1090	1023	270	683	683	1115	1121	1038	1103	1115	1117	1133	545		
1500	728	554	269	901	901	968	1090	1057	961	1082	1080	1099	595	415	
1600	465	288	300	775	775	924	985	913	800	983	980	997	396	333	
1700	471	172	221	637	637	802	808	504	790	814	818	820	203	279	
1800	347	187	201	267	267	580	589	413	580	588	579	553	127	162	
1900	215	73	125	244	244	335	341	204	330	346	218	194	66	102	
2000	93	26	20	86	86	103	111	36	113	105	61	90	28	39	
2100	2	1	1	2	2	3	3	2	2	2	6	6	4	7	
2200	1	1	1	1	1	1	0	1	1	0	2	2	2	2	
2300	1	1	1	1	1	1	0	1	0	0	2	2	2	2	
0	1	1	1	1	1	1	1	1	0	0	2	2	2	2	
Daily Average:	154	271	106	238	238	322	340	297	322	340	355	339	125	128	34

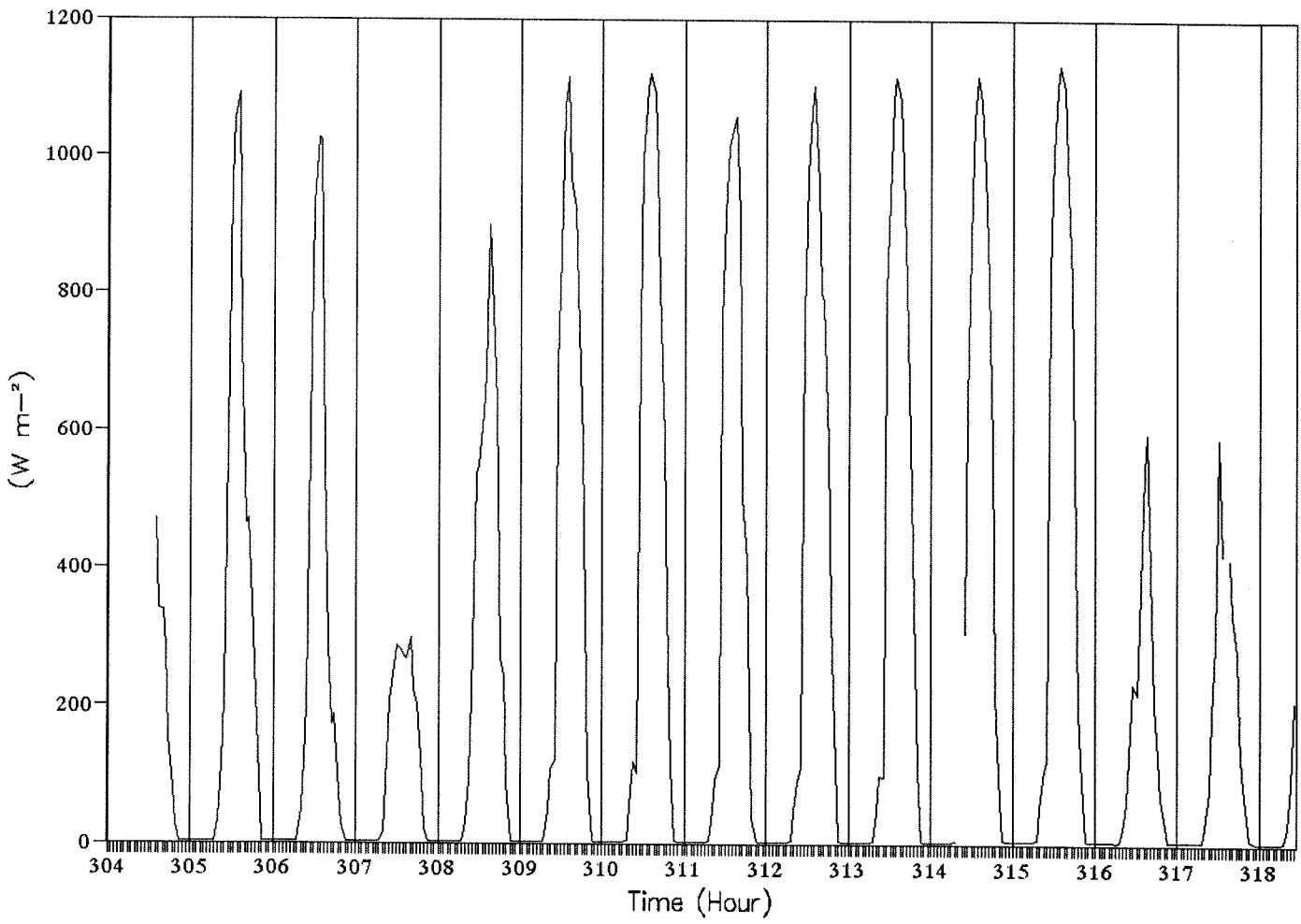
Daily maximum hourly solar radiation

Summit - 1987	Summit - 1987	Daily Average:	Daily Average:
Average:	251	Maximum Daily Average:	355
Maximum:	1133	Minimum Daily Average:	34
Minimum:	0		
Std.Dev:	361		

Daily Maximum:	470	1090	1025	300	901	1115	1117	1133	595	590	207
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# Solar Radiation

Chile 1987 - Summit



**CHILE METEOROLOGICAL DATA**Year: 1988Site: RIDGEPeriod: 306-318

Average and maximum/minimum of the meteorological parameters for  
November 1 - 13, 1988 :  
(5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m\ s^{-1}$ )
Average	2.40	173	11.1	81.1	930	3.04
Maximum	6.75	319	18.6	90.7	934	7.95
Minimum	0.45	18	7.6	38.6	927	

Average and minimum/maximum of the meteorological parameters for  
November 1 - 13, 1988 when wind direction was  $270^{\circ} \pm 20^{\circ}$  :  
(5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m\ s^{-1}$ )
Average	3.77	256	10.7	84.9	931	4.72
Maximum	6.75	286	15.3	90.7	934	7.95
Minimum	0.45	250	8.5	64.2	927	

**CHILE METEOROLOGICAL DATA**Year: 1988Site: RIDGEPeriod: 306-318

Hourly average and hourly maximum/minimum of the meteorological parameters for  
November 1 - 13, 1988:

(from 5 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )	Hourly Peak Gust ( $m\ s^{-1}$ )
Average	2.40	173	11.1	81.1	930	222	3.04
Maximum	5.85	260	15.8	90.7	934	1112	7.23
Minimum	0.50	34	7.8	42.4	927	1	

Hourly average and hourly maximum/minimum of the meteorological parameters for  
November 1 - 13, 1988 when wind direction was  $270^{\circ} \pm 20^{\circ}$ :

(from 5 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )	Hourly Peak Gust ( $m\ s^{-1}$ )
Average	4.06	254	10.8	84.7	931	388	5.08
Maximum	5.57	260	13.9	88.1	934	1041	7.03
Minimum	1.30	250	9.0	75.8	928	29	

File: ER8HRWS.WQ1  
 Chile 1988 - Ridge  
 Hourly Ws data  
 Period: November 1 - 13

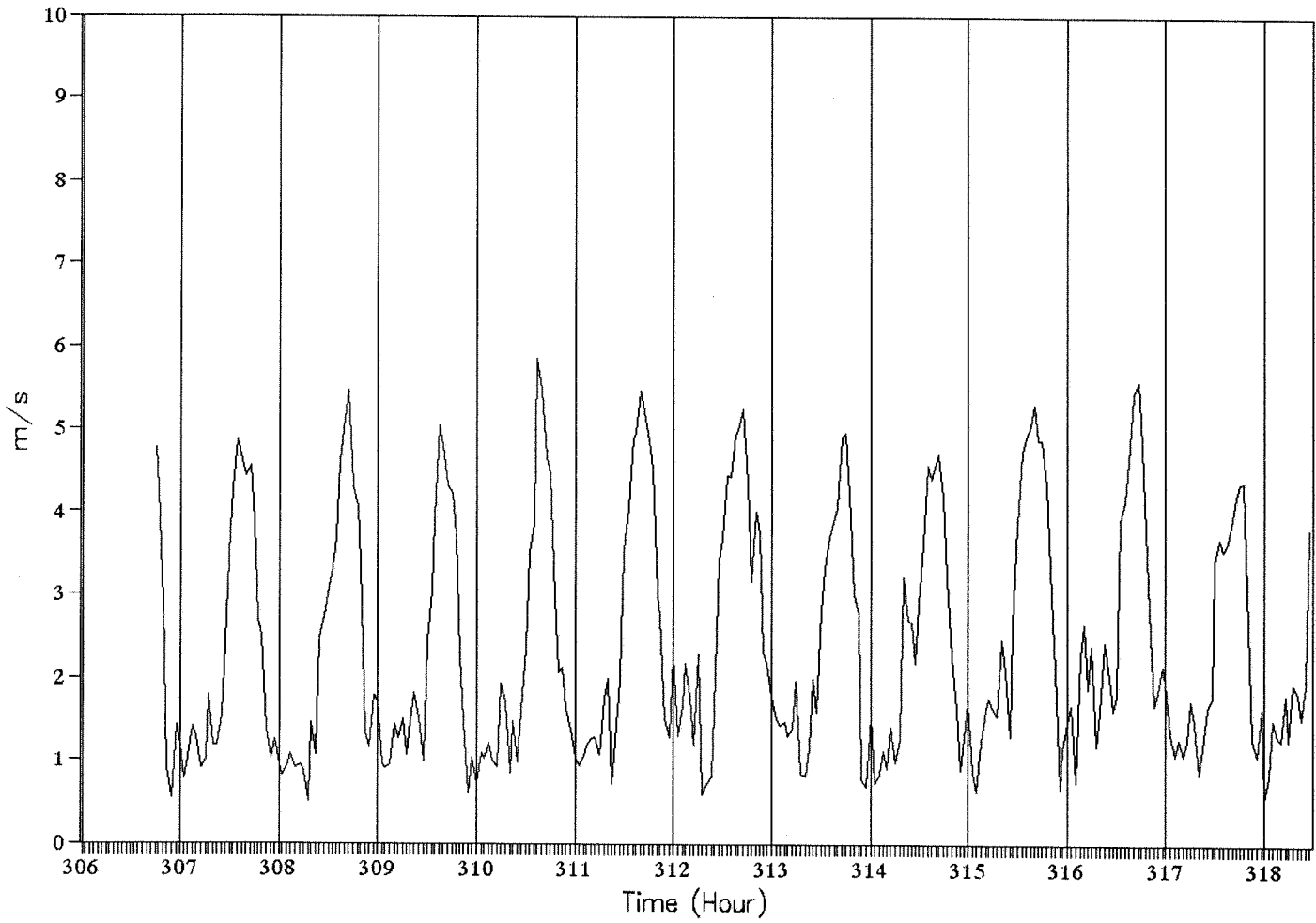
Wind Speed TIME/JD	306	307	308	309	310	311	312	313	314	315	316	317	318
100		0.78	0.80	0.95	1.08	0.94	1.30	1.49	0.73	0.86	1.67	1.34	0.82
200		1.03	0.92	0.90	1.02	1.05	1.65	1.42	0.85	0.62	0.73	1.05	1.49
300		1.41	1.07	0.96	1.20	1.18	2.17	1.46	1.13	1.23	2.26	1.26	1.29
400		1.28	0.89	1.44	0.99	1.26	1.76	1.30	0.89	1.62	2.65	1.05	1.25
500		0.89	0.95	1.26	0.92	1.27	1.17	1.38	1.40	1.75	1.87	1.25	1.79
600		1.00	0.85	1.49	1.93	1.05	2.29	1.96	0.97	1.61	2.39	1.72	1.25
700		1.78	0.50	1.05	1.69	1.75	0.58	0.84	1.26	1.53	1.17	1.46	1.91
800		1.18	1.45	1.47	0.84	1.99	0.72	0.80	3.21	2.46	1.59	0.84	1.82
900		1.18	1.05	1.81	1.47	0.70	0.79	1.15	2.69	2.07	2.42	1.28	1.51
1000		1.55	2.46	1.51	0.97	1.22	1.61	2.00	2.68	1.30	2.01	1.65	1.93
1100		2.41	2.74	0.99	1.60	1.98	3.42	1.58	2.16	2.63	1.60	1.76	3.81
1200		3.77	3.09	2.42	2.34	3.55	3.68	2.81	2.90	3.85	1.80	3.40	
1300		4.26	3.29	3.03	3.50	4.04	4.43	3.31	3.62	4.74	3.91	3.69	
1400		4.85	3.69	3.91	3.84	4.89	4.41	3.72	4.57	4.89	4.14	3.55	
1500		4.60	4.57	5.03	5.85	4.94	4.94	3.93	4.39	5.05	4.62	3.64	
1600		4.41	5.10	4.78	5.47	5.45	4.98	4.05	4.59	5.29	5.43	3.93	
1700		4.54	5.45	4.30	4.66	5.18	5.24	4.91	4.69	4.86	5.57	4.20	
1800	4.76	3.85	4.29	4.21	4.45	4.84	4.35	4.94	4.18	4.87	5.12	4.34	
1900	4.24	2.68	4.05	3.72	2.96	4.49	3.15	3.94	3.21	4.33	3.79	4.35	
2000	2.89	2.50	3.36	2.25	2.07	3.00	3.98	3.01	2.24	2.99	2.82	2.64	
2100	0.89	1.37	1.32	1.47	2.11	2.73	3.73	2.77	1.62	2.09	1.67	1.26	
2200	0.52	1.03	1.14	0.61	1.62	1.49	2.30	0.78	0.88	0.66	1.83	1.05	
2300	1.41	1.24	1.78	1.03	1.36	1.28	2.17	0.69	1.30	1.14	2.15	1.65	
0	1.17	0.95	1.71	0.71	1.04	2.27	1.77	1.55	1.72	1.48	1.95	0.53	
Daily Average:	2.27	2.27	2.36	2.14	2.29	2.61	2.77	2.32	2.41	2.66	2.72	2.20	1.72

Ridge - 1988  
 Average: 2.40  
 Maximum: 5.85  
 Minimum: 0.50  
 Std.Dev: 1.44

Maximum Daily Average: 2.77  
 Minimum Daily Average: 1.72

# Wind Speed

Chile 1988 - Ridge



**CHILE 1988 METEOROLOGICAL DATA**Site: RIDGEPeriod: November 1 - 13, 1988 (JD:306-318)Frequency distribution for hourly wind speed ( $\text{m s}^{-1}$ )

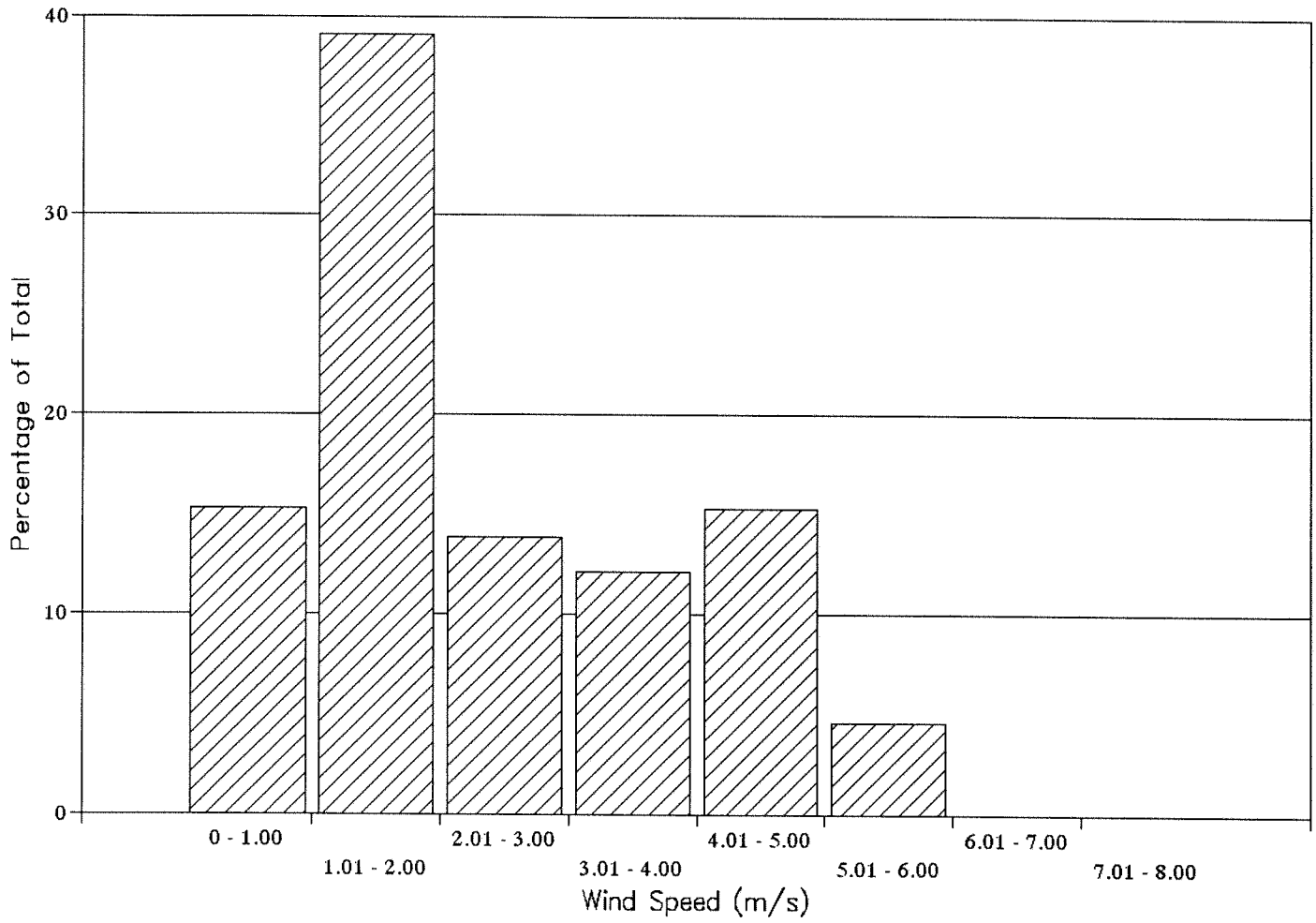
BINS	RANGES	FREQUENCY	% of TOTAL
1	0 - 1.00	43	15.25
2	1.01 - 2.00	110	39.01
3	2.01 - 3.00	39	13.83
4	3.01 - 4.00	34	12.06
5	4.01 - 5.00	43	15.25
6	5.01 - 6.00	13	4.61
7	6.01 - 7.00	0	0
8	7.01 - 8.00	0	0
Total =		282	100

Cummulative frequency distribution for hourly wind speed

Wind speed ( $\text{m s}^{-1}$ )	Cummulative frequency	Cummulative % of Total
Less than 1.01	43	15.25
Less than 2.01	153	54.26
Less than 3.01	192	68.09
Less than 4.01	226	80.14
Less than 5.01	269	95.39
Less than 6.01	282	100
Less than 7.01	282	100
Less than 8.01	282	100

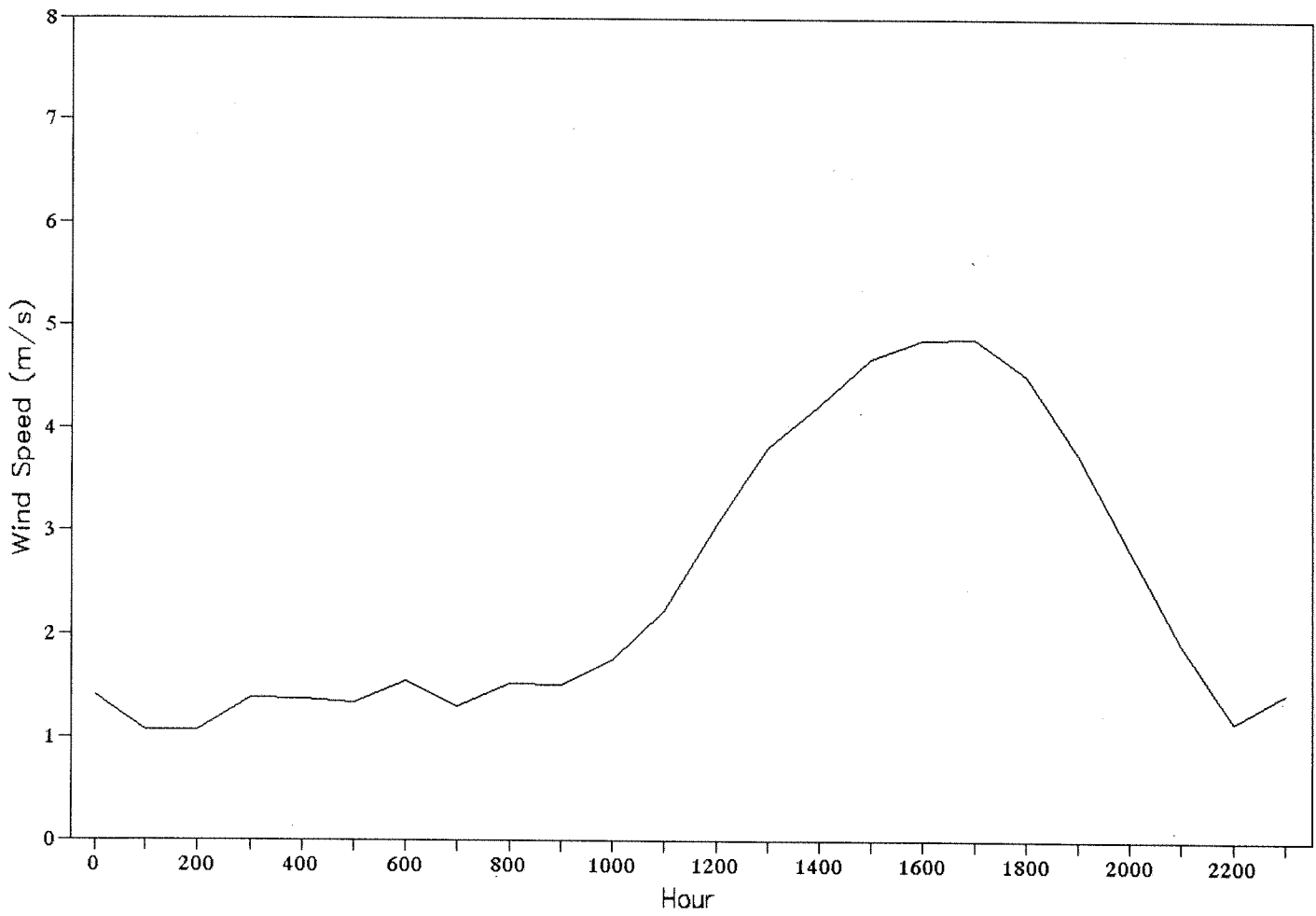
# Frequency Distribution of Wind Speed

Chile 1988 - Ridge



# Diurnal Cycle of Wind Speed

## Chile 1988 - Ridge



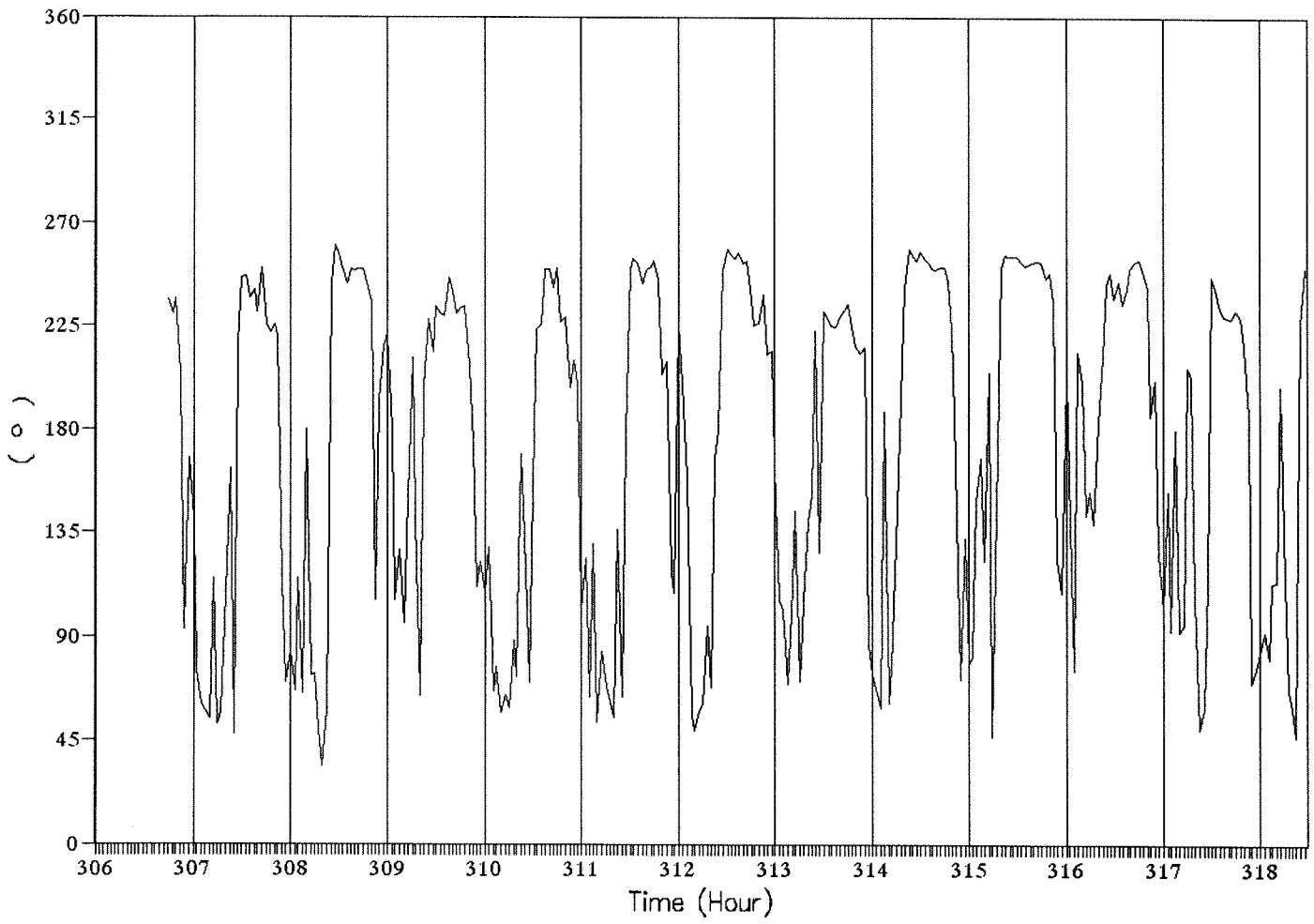
**File: ER8HRWD.WQ1**  
**Chile 1988 - Ridge**  
 Hourly Wd data  
 Period: November 1 - 13

<u>Wind Direction</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100		75	66	179	128	124	199	105	68	81	161	152	92
200		60	115	106	66	64	159	101	59	149	75	92	80
300		58	65	128	76	130	56	69	187	167	214	180	112
400		54	180	95	57	53	49	111	61	123	200	91	113
500		115	73	150	65	84	58	144	77	205	142	95	199
600		52	74	211	59	69	61	71	130	47	152	207	114
700		57	50	140	88	62	94	105	193	144	139	203	67
800		109	34	64	72	55	68	140	242	251	183	106	59
900		162	59	198	169	136	167	151	258	256	212	50	46
1000		47	244	228	133	64	180	223	256	255	243	59	226
1100		217	260	214	70	178	249	126	253	255	248	113	250
1200		246	256	233	181	249	258	231	257	255	237	246	
1300		246	250	230	224	255	256	228	255	253	244	242	
1400		237	244	230	226	252	254	225	252	251	235	233	
1500		241	249	246	249	243	257	225	250	252	241	229	
1600		231	249	240	250	249	252	229	250	252	250	229	
1700		250	249	230	242	251	253	232	251	253	252	228	
1800	237	226	250	233	250	253	237	234	251	253	254	232	
1900	230	222	241	233	227	245	225	224	244	246	249	229	
2000	237	226	236	208	229	204	227	216	224	248	242	216	
2100	204	221	105	173	198	209	239	213	165	236	186	186	
2200	93	114	192	111	210	117	212	216	72	123	201	70	
2300	168	70	216	122	199	109	215	86	132	108	126	76	
0	141	83	221	108	101	226	164	74	78	203	101	84	
Daily Average:	187	151	174	180	157	162	183	166	186	203	200	160	124

**Ridge - 1988**

Average:	173	Maximum Daily Average:	203
Maximum:	260	Minimum Daily Average:	124
Minimum:	34		
Std.Dev:	72		

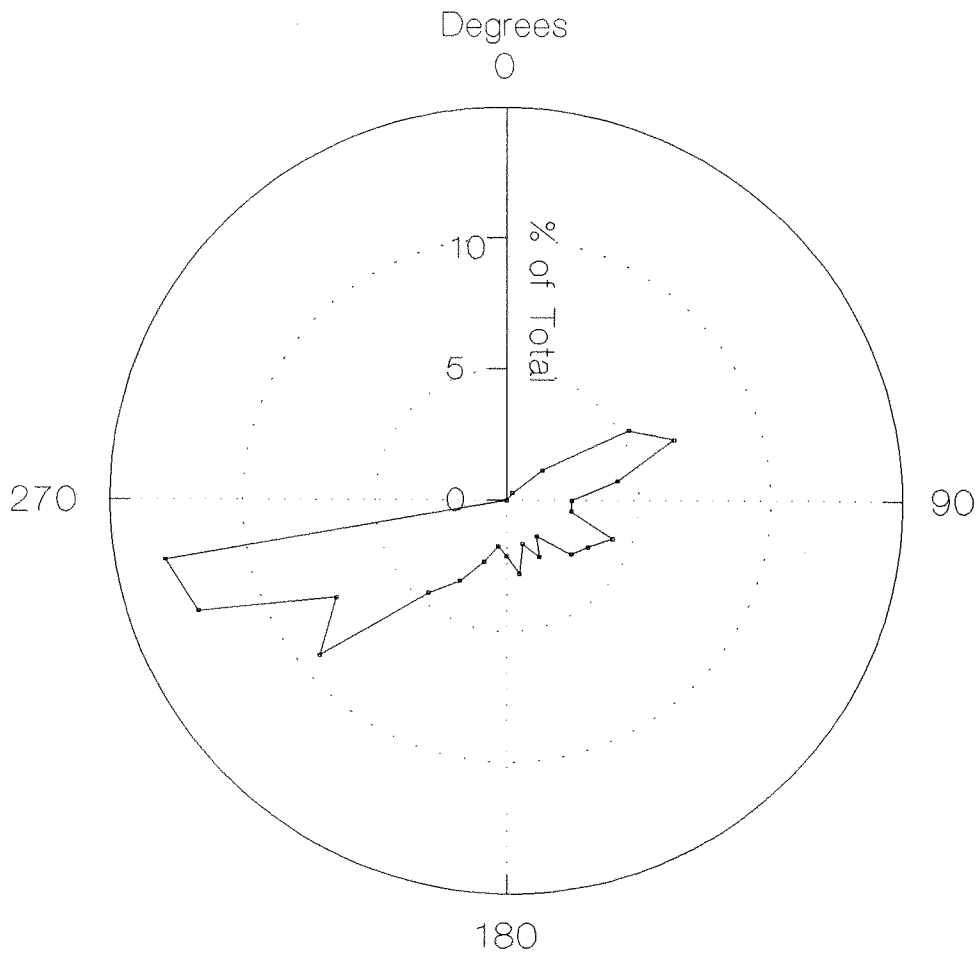
# Wind Direction Chile 1988 - Ridge



Wind Direction Frequency Distribution

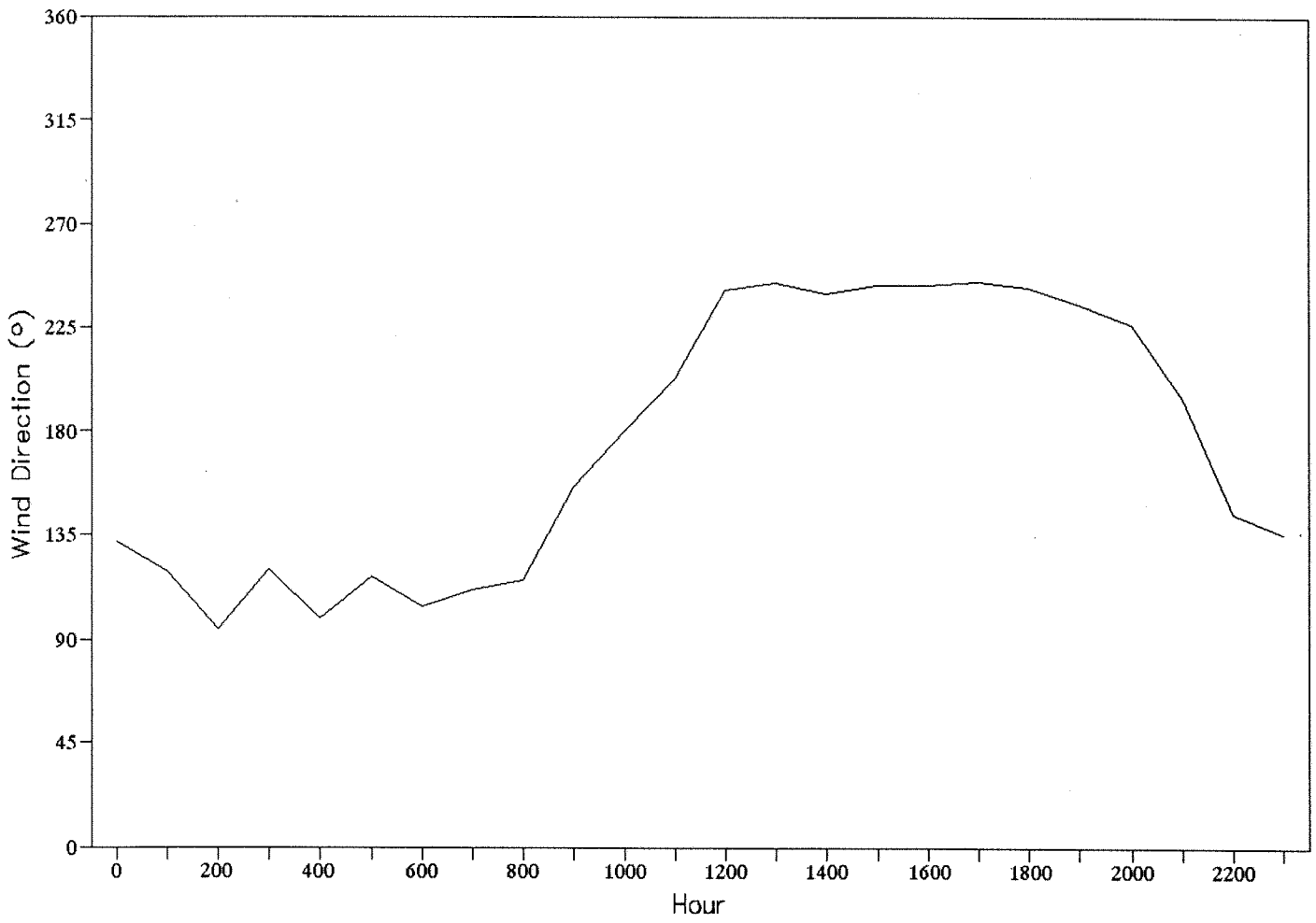
CHILE RIDGE 1988

Degrees	Counts	% of total	Direction	Degrees	Counts	% of total
10	0	0.00	NE	45	1	0.35
20	0	0.00	E	90	58	20.57
30	0	0.00	SE	135	41	14.54
40	1	0.35	S	180	28	9.93
50	5	1.77	SW	225	43	15.25
60	15	5.32	W	270	111	39.36
70	19	6.74	NW	315	0	0.00
80	12	4.26	N	360	0	0.00
90	7	2.48			0	
100	7	2.48		Sum:	282	100
110	12	4.26				
120	10	3.55				
130	9	3.19				
140	5	1.77				
150	7	2.48				
160	5	1.77				
170	8	2.84				
180	6	2.13				
190	5	1.77				
200	7	2.48				
210	10	3.55				
220	13	4.61				
230	26	9.22				
240	21	7.45				
250	35	12.41				
260	37	13.12				
270	0	0.00				
280	0	0.00				
290	0	0.00				
300	0	0.00				
310	0	0.00				
320	0	0.00				
330	0	0.00				
340	0	0.00				
350	0	0.00				
360	0	0.00				
	0	0.00				
Sum:	282	100				



Chile 1988 - Ridge, Frequency distribution for wind direction (Systat filename: ER8WD1.SYS)

### Diurnal Variation of Wind Direction Chile 1988 - Ridge



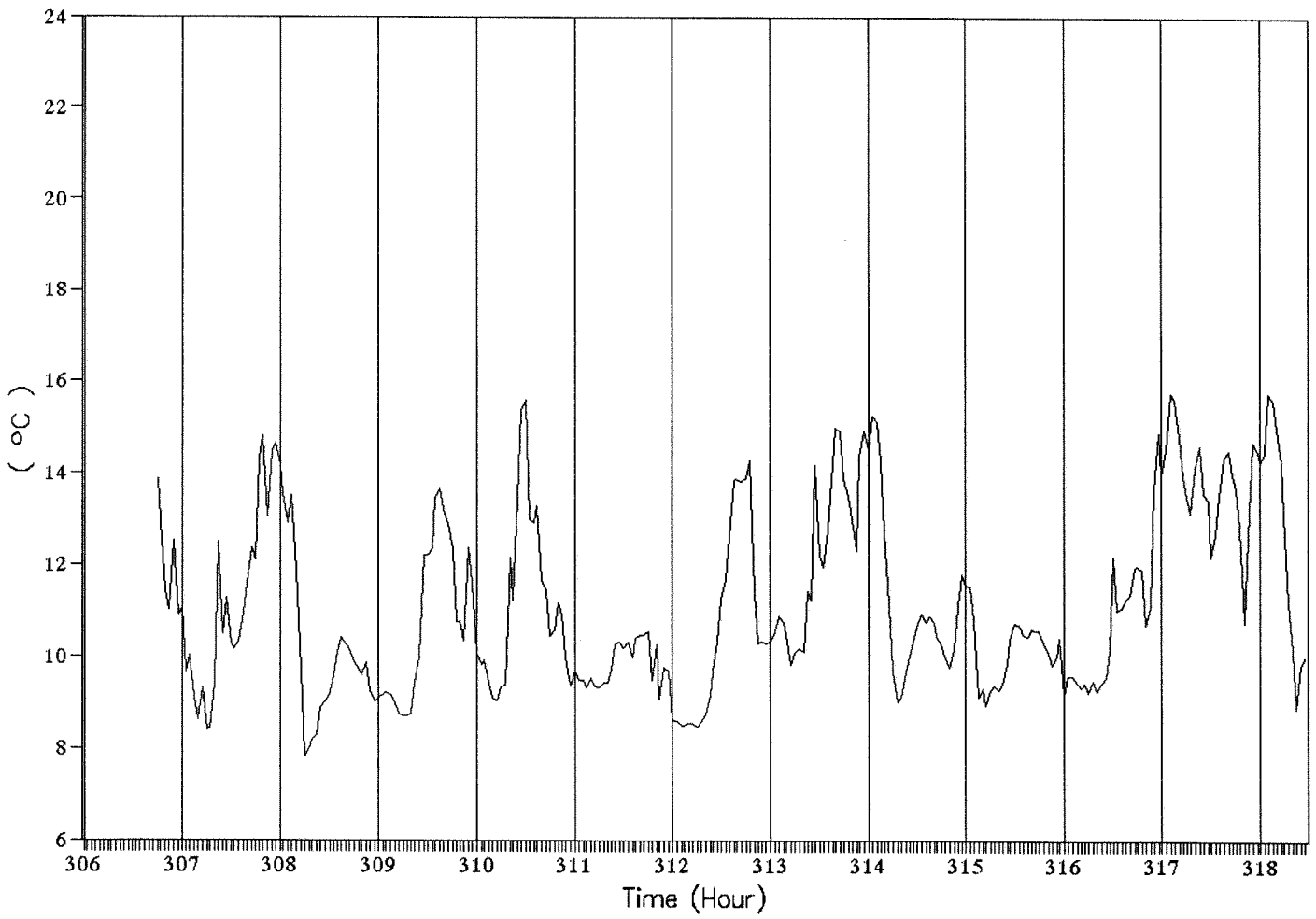
**FILE: ER8HRMP.WQ1**  
**Chile 1988 - Ridge**  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

<u>Temperature</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
TIME/JD													
100		9.6	13.6	9.1	9.8	9.5	8.6	10.5	15.2	11.5	9.6	14.5	14.5
200		10.0	12.9	9.2	9.9	9.5	8.5	10.9	15.1	10.8	9.6	15.8	15.7
300		9.1	13.5	9.1	9.4	9.3	8.5	10.8	14.2	9.1	9.4	15.6	15.6
400		8.6	11.9	9.0	9.1	9.5	8.5	10.5	12.7	9.3	9.3	14.8	15.0
500		9.3	9.7	8.7	9.0	9.3	8.5	9.8	11.5	8.9	9.4	13.9	14.2
600		8.4	7.8	8.7	9.3	9.3	8.5	10.1	9.7	9.3	9.2	13.5	13.2
700		8.4	8.0	8.7	9.4	9.4	8.5	10.2	9.0	9.4	9.5	13.1	11.2
800		9.4	8.2	8.7	12.2	9.4	8.7	10.1	9.1	9.3	9.2	14.1	10.2
900		12.5	8.3	9.4	11.2	9.7	9.2	11.4	9.6	9.4	9.4	14.6	8.9
1000		10.5	8.8	10.0	13.4	10.2	9.7	11.2	10.0	9.9	9.5	13.6	9.8
1100		11.3	9.0	12.2	15.4	10.3	10.3	14.2	10.3	10.4	10.1	13.4	10.0
1200		10.2	9.2	12.2	15.6	10.2	11.3	12.2	10.6	10.7	12.2	12.2	
1300		10.1	9.6	12.4	13.0	10.3	11.7	11.9	10.9	10.7	11.0	12.7	
1400		10.3	10.1	13.5	12.9	10.0	12.6	12.8	10.7	10.5	11.1	13.5	
1500		11.0	10.4	13.7	13.3	10.4	13.8	14.2	10.9	10.4	11.2	14.4	
1600		11.6	10.2	13.2	11.7	10.5	13.9	15.0	10.7	10.6	11.3	14.5	
1700		12.4	10.1	12.9	11.4	10.5	13.8	14.9	10.4	10.6	11.9	14.0	
1800	13.9	12.1	9.9	12.3	10.4	10.5	13.9	13.9	10.3	10.5	12.0	13.7	
1900	12.9	14.3	9.7	10.7	10.6	9.5	14.3	13.5	10.0	10.3	11.9	12.8	
2000	11.4	14.8	9.6	10.7	11.1	10.2	11.4	13.0	9.8	10.1	10.7	10.8	
2100	11.0	13.0	9.9	10.3	10.9	9.1	10.3	12.3	10.2	9.8	11.1	12.6	
2200	12.5	14.5	9.2	12.4	10.0	9.7	10.3	14.4	11.1	10.0	13.7	14.7	
2300	10.9	14.7	9.0	11.6	9.3	9.7	10.3	14.9	11.8	10.4	14.9	14.5	
0	11.0	14.2	9.1	10.1	9.7	8.6	10.3	14.5	11.6	9.1	14.0	14.3	
Daily													
Average:	12.0	11.3	9.9	10.8	11.2	9.8	10.6	12.4	11.1	10.0	10.9	13.8	12.6

**Ridge - 1988**  
 Average: 11.1  
 Maximum: 15.8  
 Minimum: 7.8  
 Std.Dev: 2.0

Maximum Daily Average: 13.8  
 Minimum Daily Average: 9.8

# Temperature Chile 1988 - Ridge



**FILE: ER8HRMP.WQI**  
**Chile 1988 - Ridge**  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

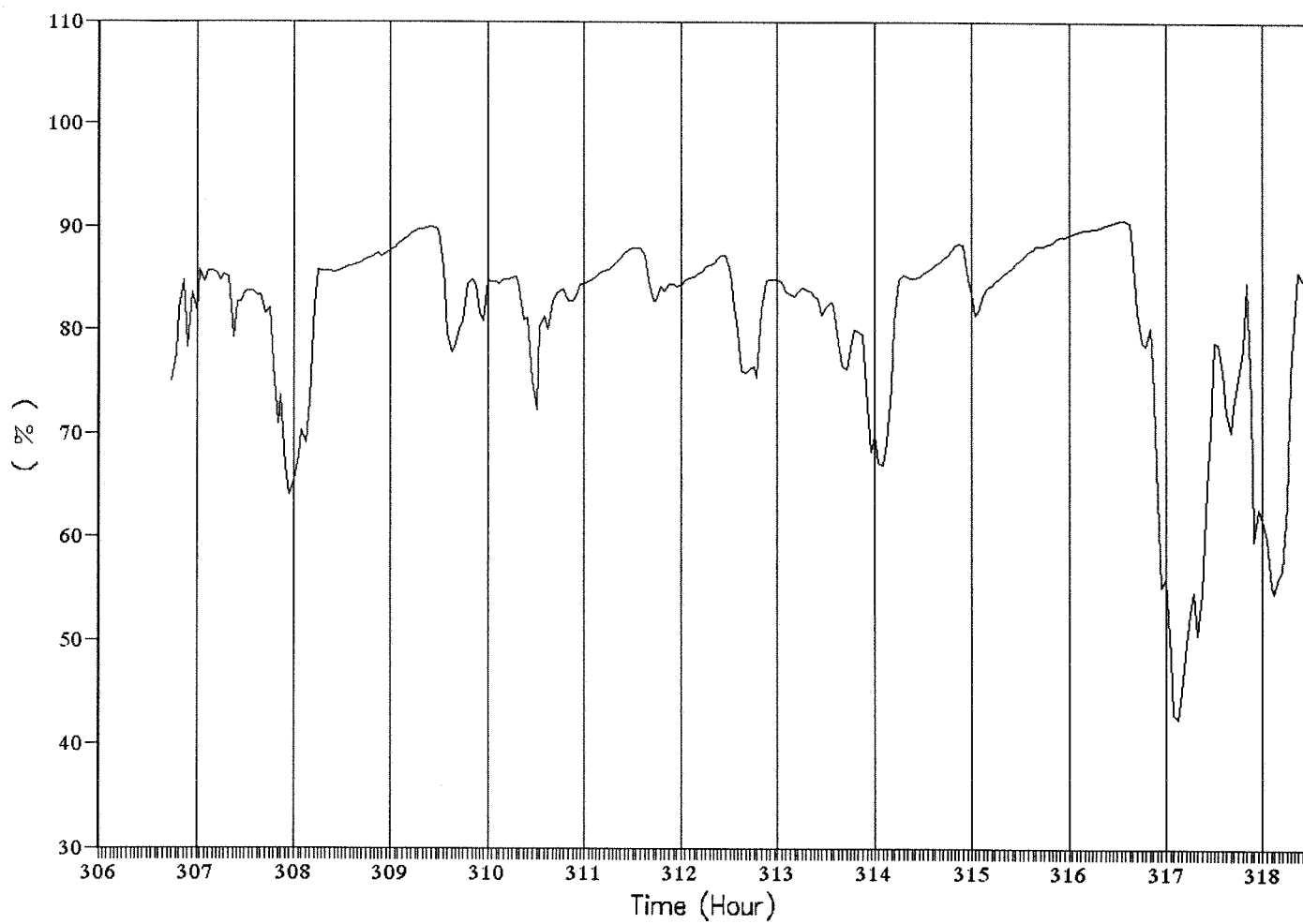
<u>Relative Humidity</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100	85.9	67.8	88.0	84.7	84.7	84.8	84.6	67.3	81.4	89.3	48.6	59.9	
200	84.7	70.2	88.3	84.6	84.9	85.0	83.7	66.9	81.9	89.5	42.9	55.3	
300	85.7	69.0	88.7	84.5	85.1	85.1	83.5	69.2	83.4	89.6	42.4	54.6	
400	85.8	73.2	89.0	84.8	85.4	85.3	83.3	74.5	84.1	89.8	45.2	56.2	
500	85.4	82.4	89.3	84.9	85.7	85.6	83.7	80.7	84.4	89.8	49.7	56.7	
600	84.7	85.9	89.5	85.0	85.9	86.0	84.0	84.9	84.6	89.9	52.7	63.3	
700	85.3	85.7	89.7	85.2	86.2	86.2	83.9	85.3	85.0	89.9	54.7	75.9	
800	85.2	85.7	89.8	84.1	86.5	86.5	83.8	85.1	85.4	90.0	50.5	80.8	
900	79.2	85.7	90.0	81.0	86.9	86.8	83.2	85.0	85.7	90.2	54.7	85.8	
1000	82.6	85.6	90.0	81.2	87.4	87.2	83.0	85.0	86.0	90.4	64.7	84.9	
1100	82.6	85.7	89.8	75.0	87.7	87.3	81.4	85.2	86.4	90.5	70.4	84.6	
1200	83.6	85.9	89.5	72.3	87.9	85.6	82.2	85.4	86.8	90.5	78.9		
1300	83.8	86.0	86.0	80.5	88.0	82.2	82.7	85.7	87.2	90.7	78.7		
1400	83.7	86.2	79.7	81.2	87.9	79.9	82.2	86.0	87.5	90.7	76.1		
1500	83.2	86.3	77.8	80.0	87.3	76.2	78.9	86.3	87.8	90.5	72.0		
1600	83.4	86.5	78.7	82.8	84.7	75.8	76.6	86.6	88.1	88.1	70.1		
1700	81.6	86.6	80.1	83.4	82.8	76.3	76.3	86.9	88.1	81.8	72.8		
1800	82.1	86.8	80.9	83.8	82.8	76.4	78.3	87.3	88.1	78.9	75.4		
1900	77.6	87.0	84.4	83.9	84.2	75.4	80.0	87.7	88.3	78.5	78.3		
2000	81.8	87.2	84.9	82.8	83.8	82.0	79.9	88.1	88.6	80.4	84.6		
2100	84.7	87.3	84.4	82.8	84.5	84.7	79.7	88.4	88.8	76.7	73.2		
2200	78.3	87.1	81.6	83.3	84.5	84.9	72.8	88.3	89.0	63.9	59.6		
2300	83.7	87.4	80.9	84.4	84.2	84.9	68.1	85.0	89.1	55.1	62.8		
0	81.7	87.7	84.7	84.5	84.3	84.9	69.9	83.5	89.2	55.9	61.8		
Daily Average:	80.4	80.2	83.5	85.6	82.5	85.5	83.1	80.2	83.1	86.4	83.8	63.4	68.9

**Ridge - 1988**

Average:	81.1	Maximum Daily Average:	86.4
Maximum:	90.7	Minimum Daily Average:	63.4
Minimum:	42.4		
Std.Dev:	9.3		

# Relative Humidity

Chile 1988 - Ridge



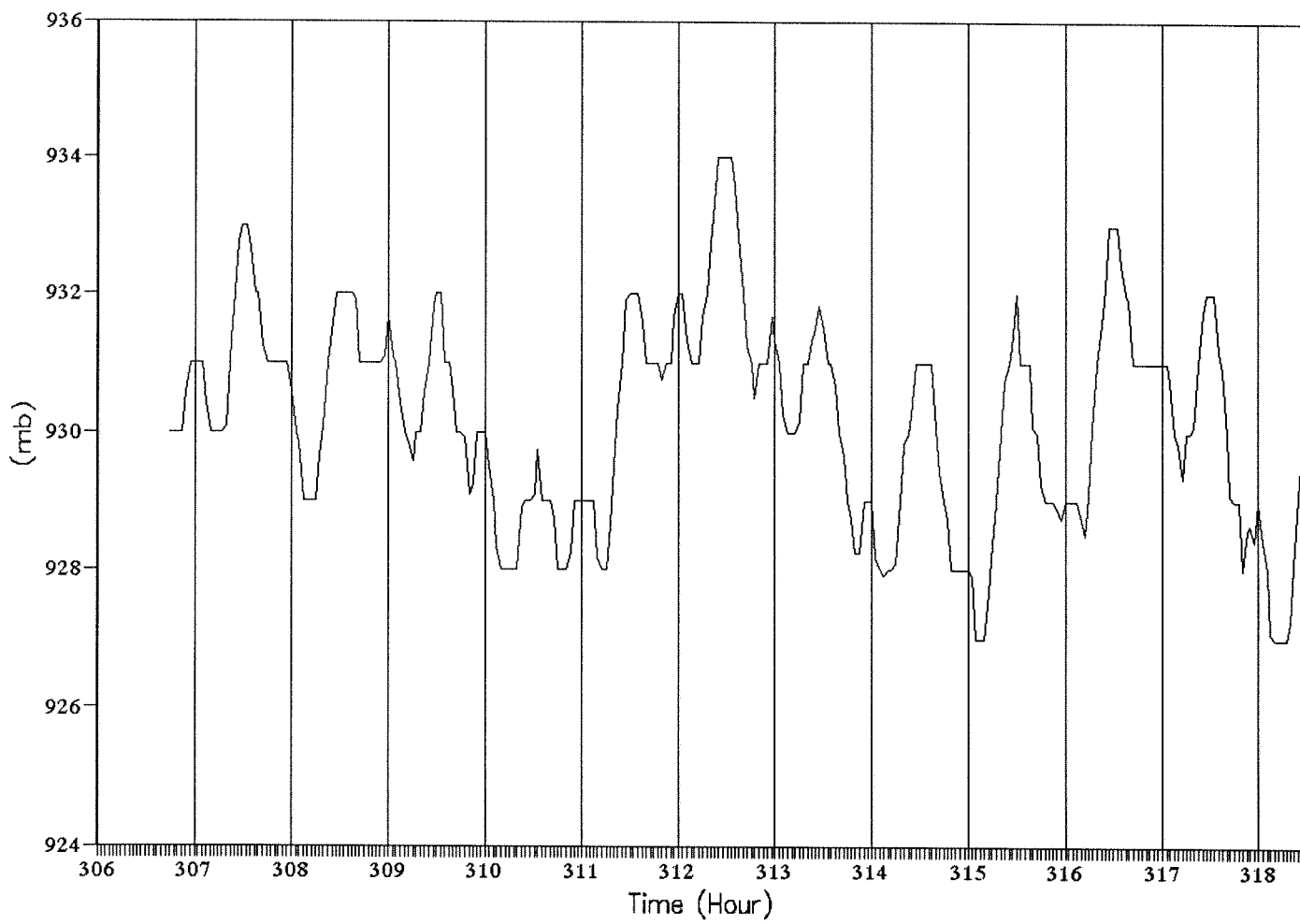
**FILE: ER8HRMP.WQ1**  
**Chile 1988 - Ridge**  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

<u>Pressure</u>	<u>TIME/JD</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100		931	930	930	931	930	929	932	931	928	928	929	931	928
200		931	930	930	931	929	929	931	930	928	927	929	931	928
300		930	929	929	930	928	929	931	930	928	927	929	930	927
400		930	929	929	930	928	928	931	930	928	927	929	930	927
500		930	929	929	930	928	928	931	930	928	928	929	929	927
600		930	929	929	930	928	928	932	930	928	928	929	930	927
700		930	930	930	930	928	929	932	931	929	929	930	930	927
800		930	930	930	930	928	930	933	931	930	930	931	930	927
900		931	931	931	931	929	930	933	931	930	931	932	931	928
1000		932	932	932	931	929	931	934	932	930	931	932	932	929
1100		933	932	932	932	929	932	934	932	931	931	933	932	930
1200		933	932	932	932	929	932	934	932	931	932	933	932	
1300		933	932	932	932	930	932	934	931	931	931	933	932	
1400		933	932	932	931	929	932	934	931	931	931	932	931	
1500		932	932	932	931	929	932	933	931	931	931	932	931	
1600		932	932	932	931	929	931	932	930	930	930	932	930	
1700		931	931	931	930	929	931	931	930	929	930	931	929	
1800	930	931	931	931	930	928	931	931	929	929	929	931	929	
1900	930	931	931	931	930	928	931	931	929	929	929	931	929	
2000	930	931	931	931	929	928	931	931	928	928	929	931	928	
2100	930	931	931	931	929	928	931	931	928	928	929	931	929	
2200	931	931	931	931	930	929	931	931	929	928	929	931	929	
2300	931	931	931	931	930	929	932	932	929	928	929	931	928	
0	931	931	932	932	930	929	932	931	929	928	929	931	929	
Daily														
Average:	930	931	931	930	930	929	930	932	930	929	929	931	930	928

**Ridge - 1988**

Average:	930	Maximum Daily Average:	932
Maximum:	934	Minimum Daily Average:	928
Minimum:	927		
Std.Dev:	2		

# Pressure Chile 1988 - Ridge



FILE: ERSHRMP.WQ1  
 Chile 1988 - Ridge  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

Solar Radiation													
TIME/ID	306	307	308	309	310	311	312	313	314	315	316	317	318
100		2	2	2	2	2	2	2	2	2	2	2	2
200		2	2	1	2	2	2	2	2	2	1	2	2
300		2	2	1	2	2	2	2	2	2	1	2	2
400		2	2	1	2	2	1	2	2	1	1	2	2
500		1	2	1	2	2	1	2	2	1	1	2	2
600		1	2	1	1	1	1	1	2	1	1	2	2
700		3	2	3	3	3	2	4	3	2	2	4	4
800		54	24	38	66	35	27	69	31	29	21	83	64
900		313	99	173	249	140	90	282	60	85	114	375	183
1000		435	157	332	533	219	220	412	103	127	202	615	237
1100		496	218	750	760	311	415	769	173	285	361	820	224
1200		429	290	932	936	366	573	775	258	372	759	849	
1300		428	365	1019	1033	422	626	884	407	358	537	1042	
1400		498	502	1069	1068	412	922	1039	349	349	647	1112	
1500		559	432	953	800	520	1041	1057	402	367	667	1086	
1600		647	293	732	536	424	940	958	321	339	653	990	
1700		648	189	683	391	347	769	795	247	262	633	826	
1800	579	493	128	407	208	274	577	530	152	152	524	613	
1900	339	344	71	167	179	105	341	350	93	74	354	350	
2000	89	111	20	61	82	68	83	95	34	26	106	80	
2100	3	4	3	3	3	3	3	5	3	3	5	7	
2200	2	2	2	2	2	2	2	2	2	2	2	2	
2300	2	2	2	2	2	2	2	2	2	2	2	2	
0	2	2	2	2	2	2	2	2	2	2	2	2	
Daily													
Average:	145	228	117	306	286	153	277	335	110	119	233	369	66

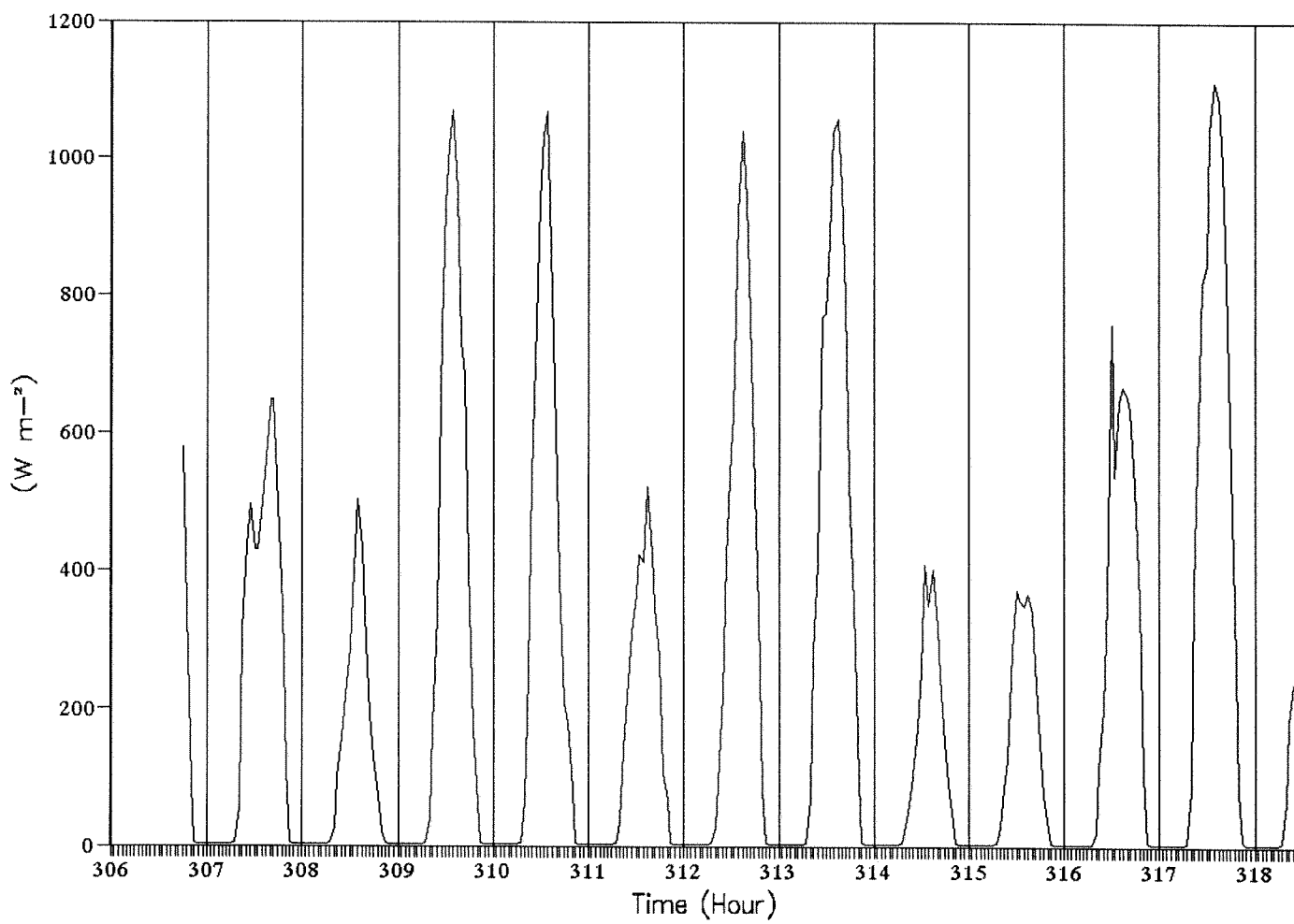
**Ridge - 1988**  
 Average: 222  
 Maximum: 1112  
 Minimum: 1  
 Std.Dev: 305

**Daily maximum hourly solar radiation**  
 Average: 721  
 Maximum: 1112  
 Minimum: 237  
 Min/Max: 0.21

Daily  
 Maximum: 579      648      502      1069      1068      520      1041      1057      407      372      759      1112      237

# Solar Radiation

## Chile 1988 - Ridge



**CHILE METEOROLOGICAL DATA**Year: 1988Site: SUMMITPeriod: 306-318

Average and maximum/minimum of the meteorological parameters for  
November 1 - 13, 1988 :  
(5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m\ s^{-1}$ )
Average	2.14	199	14.05	79.4	924	2.84
Maximum	6.83	351	21.81	92.6	928	9.38
Minimum	0.45	9	8.35	38.7	921	

Average and maximum/minimum of the meteorological parameters for  
November 1 - 13, 1988 when wind direction was  $270^{\circ} \pm 20^{\circ}$  :  
(5 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	5 min Peak Gust ( $m\ s^{-1}$ )
Average	3.27	273	14.04	82.5	925	4.26
Maximum	6.83	290	20.90	92.6	928	9.38
Minimum	0.45	250	9.30	42.5	921	

**CHILE METEOROLOGICAL DATA**

Year: 1988  
 Site: SUMMIT  
 Period: 306-318

Hourly average and hourly maximum/minimum of the meteorological parameters for  
November 1 - 13, 1988  
 (from 5 minute avg data)

Parameter	W <sub>s</sub> (m s <sup>-1</sup> )	W <sub>d</sub> (°)	T (°C)	RH (%)	p (mb)	R (W m <sup>-2</sup> )	Hourly Peak Gust (m s <sup>-1</sup> )
Average	2.14	199	14.1	79.4	924	226	2.84
Maximum	5.96	289	20.5	92.5	928	1070	7.39
Minimum	0.47	54	9.4	40.1	921	2	

Hourly average and hourly maximum/minimum of the meteorological parameters for  
November 1-13, 1988 when wind direction was 270° ± 20°:  
 (from 5 minute avg data)

Parameter	W <sub>s</sub> (m s <sup>-1</sup> )	W <sub>d</sub> (°)	T (°C)	RH (%)	p (mb)	R (W m <sup>-2</sup> )	Hourly Peak Gust (m s <sup>-1</sup> )
Average	3.45	272	14.0	82.5	925	418	4.47
Maximum	5.96	289	17.2	92.5	928	1070	7.39
Minimum	0.77	250	10.1	44.3	921	2	

**FILE: ES8HRWS.WQ1**  
**Chile 1988 - Summit**  
 Hourly Ws data  
 Period: November 1 - 13

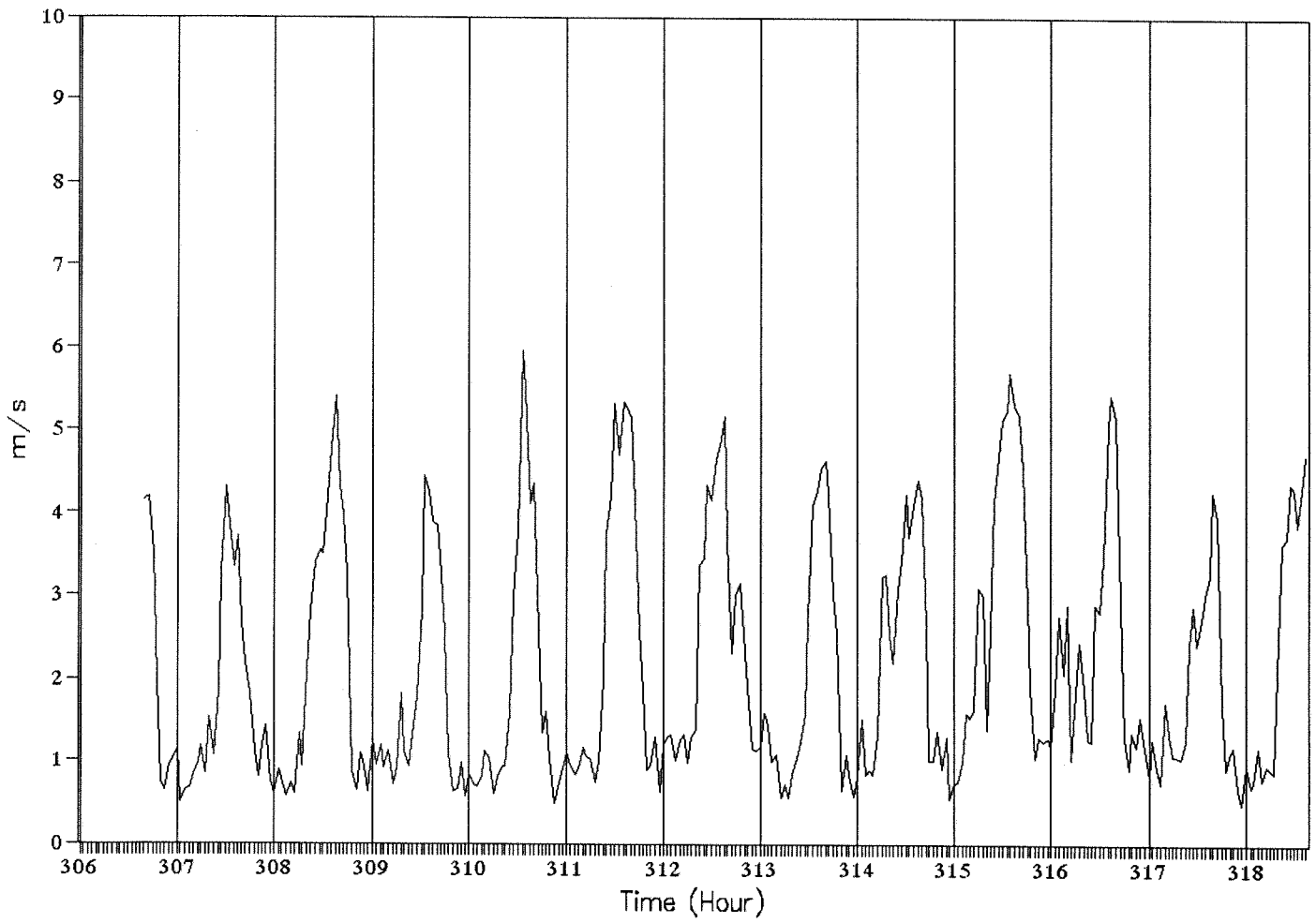
<u>Wind Speed</u> <u>TIME/JD</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100		1.13	0.74	0.61	0.57	0.90	0.62	1.13	0.56	0.53	1.27	1.14	0.47
200		0.50	0.60	1.24	0.82	1.11	1.19	1.17	0.79	0.72	1.16	0.81	0.95
300		0.64	0.87	0.95	0.71	0.95	1.29	1.57	1.51	0.74	1.88	1.26	0.68
400		0.67	0.77	1.19	0.69	0.83	1.31	1.43	0.83	1.01	2.75	0.89	0.75
500		0.82	0.57	0.92	0.81	0.90	1.01	0.97	0.87	1.58	2.07	0.73	1.16
600		0.97	0.72	1.12	1.12	1.15	1.27	1.07	0.83	1.53	2.88	1.72	0.77
700		1.17	0.61	0.71	1.04	1.06	1.31	0.55	1.31	1.63	1.02	1.33	0.95
800		0.84	1.32	0.91	0.60	1.02	0.96	0.70	3.20	3.08	1.65	1.05	0.90
900		1.53	0.94	1.81	0.78	0.73	1.30	0.55	3.24	3.00	2.43	1.05	0.86
1000		1.05	2.07	1.11	0.92	0.98	1.39	0.85	2.52	1.38	1.88	1.03	2.08
1100		1.84	2.81	0.94	0.92	1.99	3.37	1.03	2.18	2.59	1.27	1.27	3.63
1200			3.39	1.31	1.58	3.74	3.44	1.23	3.07	4.12	1.23	2.41	3.70
1300		3.26	3.54	1.77	2.97	4.18	4.33	1.57	3.40	4.68	2.88	2.85	4.34
1400		4.31	3.49	2.82	3.76	5.32	4.15	2.74	4.22	5.13	2.79	2.41	4.29
1500		3.83	4.18	4.43	5.96	4.69	4.65	4.07	3.70	5.23	3.45	2.70	3.83
1600		3.33	4.76	4.23	5.47	5.33	4.80	4.25	4.07	5.70	5.03	2.99	4.28
1700	4.14	3.71	5.40	3.89	4.09	5.27	5.16	4.54	4.39	5.29	5.42	3.25	4.69
1800	4.17	2.67	4.30	3.83	4.33	5.13	3.64	4.61	4.17	5.17	5.14	4.24	
1900	3.49	2.18	3.95	3.24	2.56	4.09	2.31	4.22	2.64	4.52	2.91	3.94	
2000	1.98	1.81	3.25	2.53	1.33	2.58	2.99	3.02	1.00	2.91	1.30	1.68	
2100	0.72	1.11	0.86	1.07	1.59	1.83	3.14	2.53	1.01	1.90	0.89	0.89	
2200	0.63	0.80	0.64	0.62	1.02	0.88	2.32	0.64	1.37	1.04	1.35	1.13	
2300	0.95	1.20	1.09	0.65	0.47	0.94	1.90	1.07	0.89	1.30	1.17	1.17	
0	1.02	1.42	0.91	0.96	0.74	1.30	1.13	0.83	1.30	1.22	1.54	0.67	
Daily Average:	2.14	1.77	2.16	1.79	1.87	2.37	2.46	1.93	2.21	2.75	2.31	1.78	2.26

**Summit - 1988**

Average:	2.14	Maximum Daily Average:	2.75
Maximum:	5.96	Minimum Daily Average:	1.77
Minimum:	0.47		
Std.Dev:	1.47		

# Wind Speed

Chile 1988 - Summit



**CHILE 1988 METEOROLOGICAL DATA**

Site: SUMMIT

Period: November 1 - 13, 1988 (JD:306-318)

Frequency distribution for hourly wind speed ( $m s^{-1}$ )

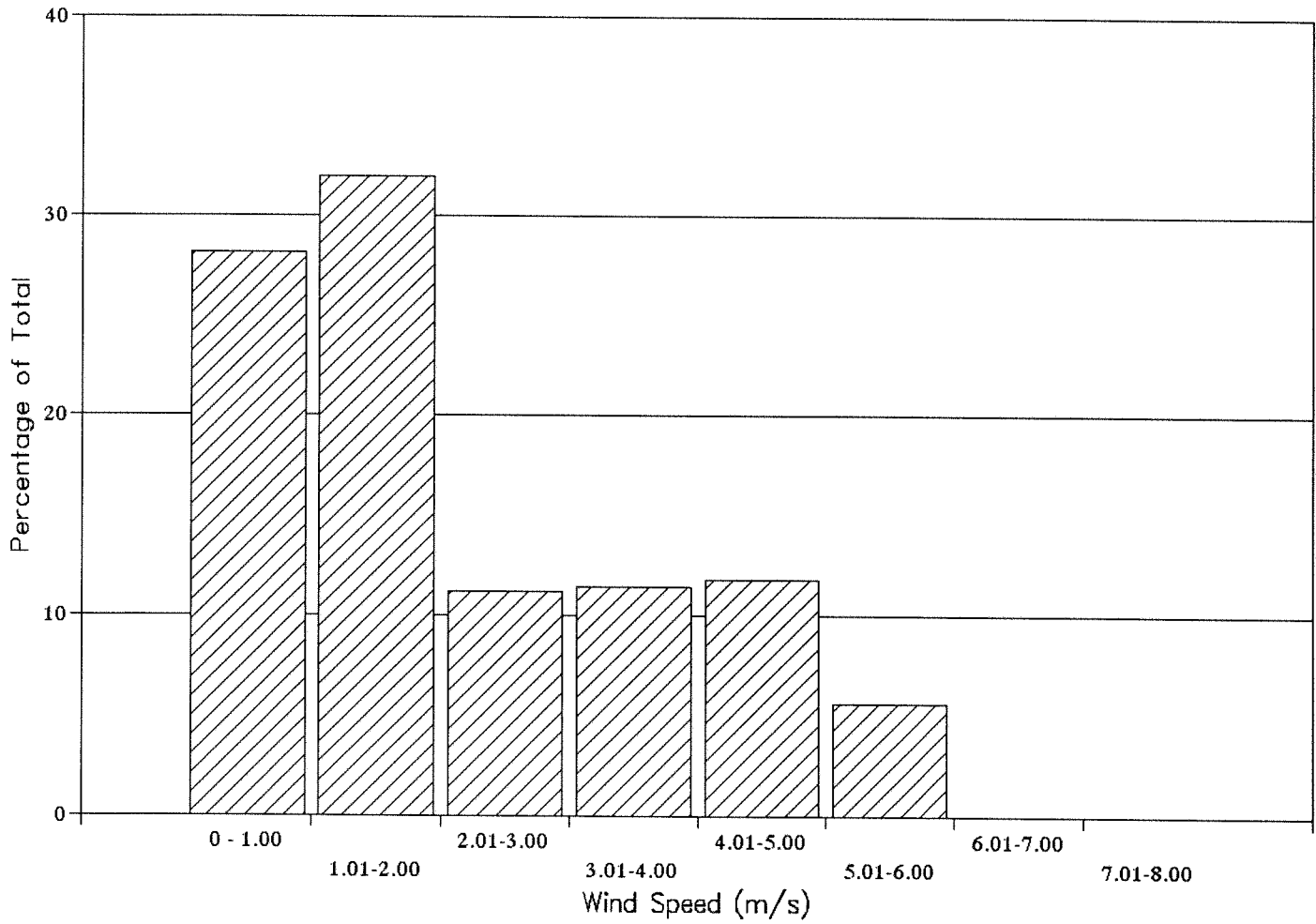
BINS	RANGES	FREQUENCY	% of TOTAL
1	0 - 1.00	81	28.13
2	1.01 - 2.00	92	31.94
3	2.01 - 3.00	32	11.11
4	3.01 - 4.00	33	11.46
5	4.01 - 5.00	34	11.81
6	5.01 - 6.00	16	5.56
7	6.01 - 7.00	0	0
8	7.01 - 8.00	0	0
Total =		288	100

Cummulative frequency distribution for hourly wind speed

Wind speed ( $m s^{-1}$ )	Cummulative frequency	Cummulative % of Total
Less than 1.01	81	28.13
Less than 2.01	173	60.07
Less than 3.01	205	71.18
Less than 4.01	238	82.64
Less than 5.01	272	94.44
Less than 6.01	288	100
Less than 7.01	288	100
Less than 8.01	288	100

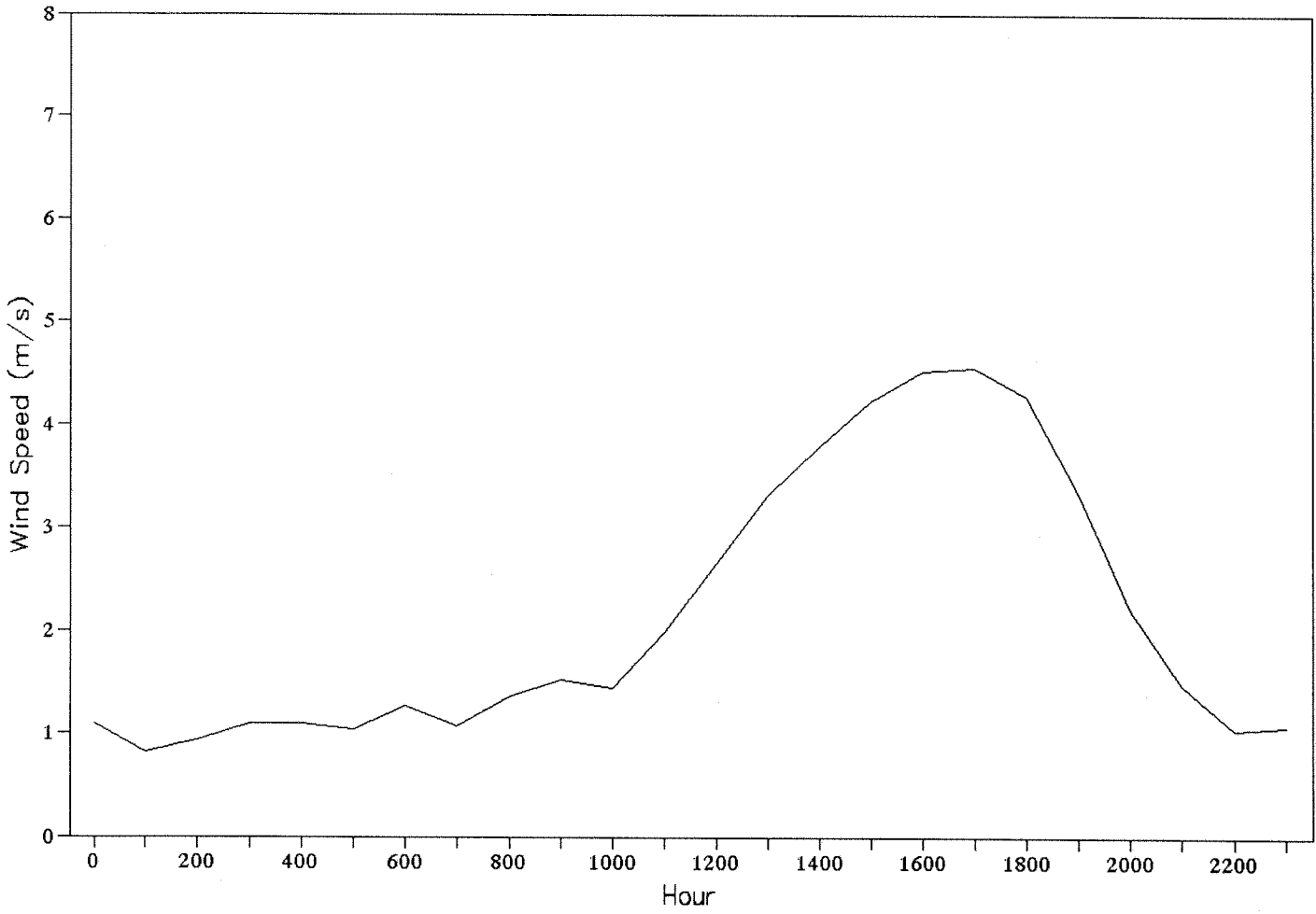
# Frequency Distribution of Wind Speed

Chile 1988 - Summit



# Diurnal Cycle of Wind Speed

Chile 1988 - Summit



File: ES8HRWD.WQ1  
 Chile 1988 - Summit  
 Hourly Wd data  
 Period: November 1 - 14

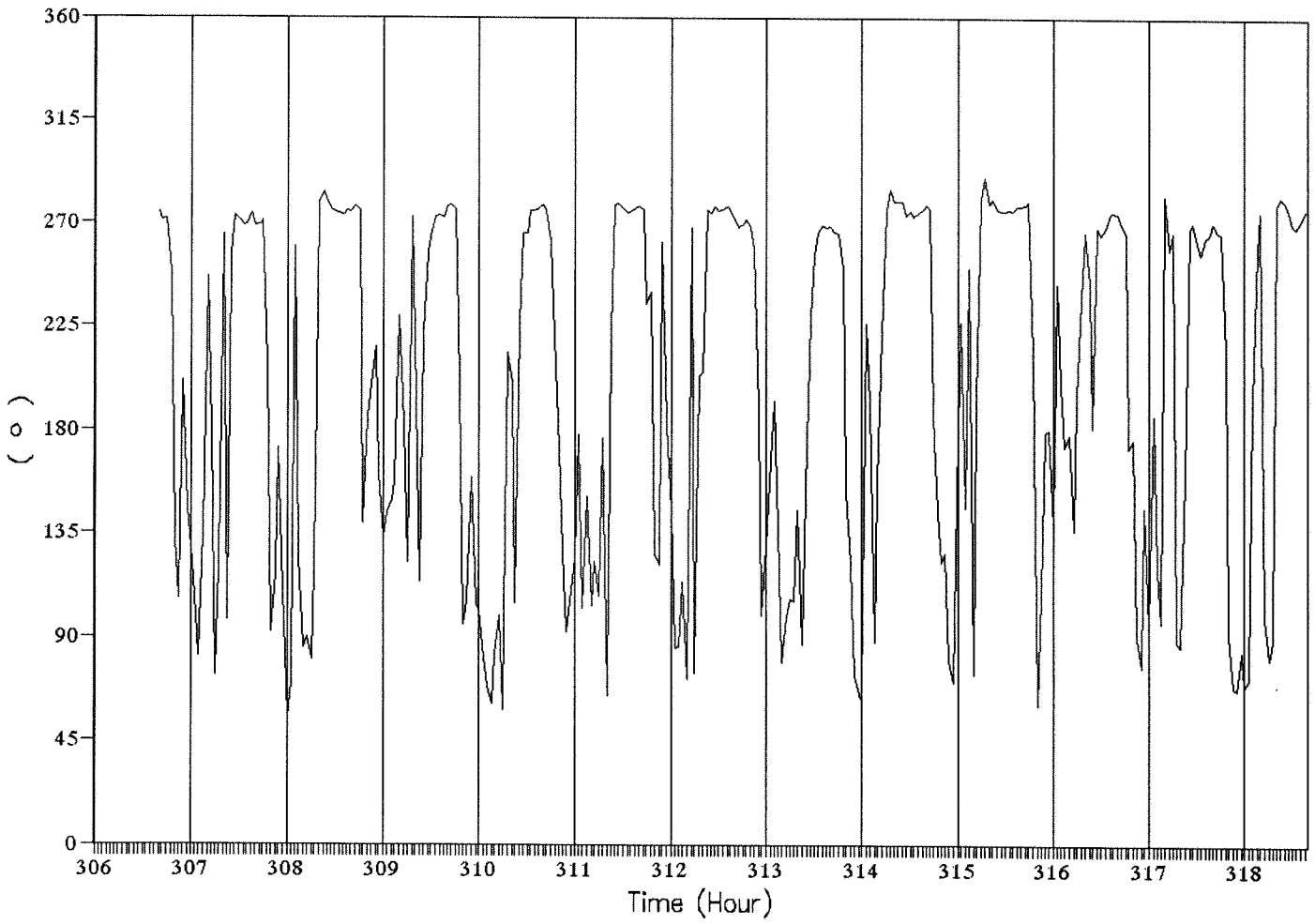
<u>Wind Direction</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100		128	110	160	104	110	183	99	65	70	180	146	84
200		108	54	133	101	125	144	129	62	178	138	94	68
300		81	70	144	81	178	85	167	226	227	243	187	72
400		134	260	149	68	102	86	193	191	146	199	119	193
500		246	124	157	60	151	114	137	87	250	173	96	259
600		179	85	229	82	103	72	78	157	74	178	282	274
700		73	90	182	99	123	268	98	222	193	136	258	99
800		121	80	122	58	107	74	106	276	281	194	266	80
900		265	119	273	213	176	203	105	284	289	237	88	89
1000		97	279	219	200	64	205	145	280	279	266	86	277
1100		256	283	114	104	222	276	87	279	280	244	159	282
1200			279	222	226	278	274	174	279	277	180	268	280
1300		273	276	257	265	278	277	229	273	275	268	270	275
1400		271	274	264	265	277	275	256	275	275	265	261	270
1500		268	274	272	275	274	276	266	272	276	267	256	268
1600		269	274	273	275	275	277	269	274	275	274	264	271
1700	275	274	275	272	277	276	275	267	276	277	275	264	276
1800	271	268	274	277	278	277	271	268	278	277	274	270	
1900	272	269	277	277	275	276	268	266	276	278	270	267	
2000	248	271	275	276	261	234	270	265	186	279	265	265	
2100	132	208	139	200	207	239	272	250	144	212	172	214	
2200	106	92	185	95	171	126	268	153	122	60	176	91	
2300	202	118	200	106	127	121	258	122	126	109	90	68	
0	146	172	216	159	92	262	190	73	80	179	76	67	
Daily Average:	206	193	199	201	173	194	215	175	208	222	210	192	201

**Summit - 1988**

Average:	199	Maximum Daily Average:	222
Maximum:	289	Minimum Daily Average:	173
Minimum:	54		
Std.Dev:	77		

# Wind Direction

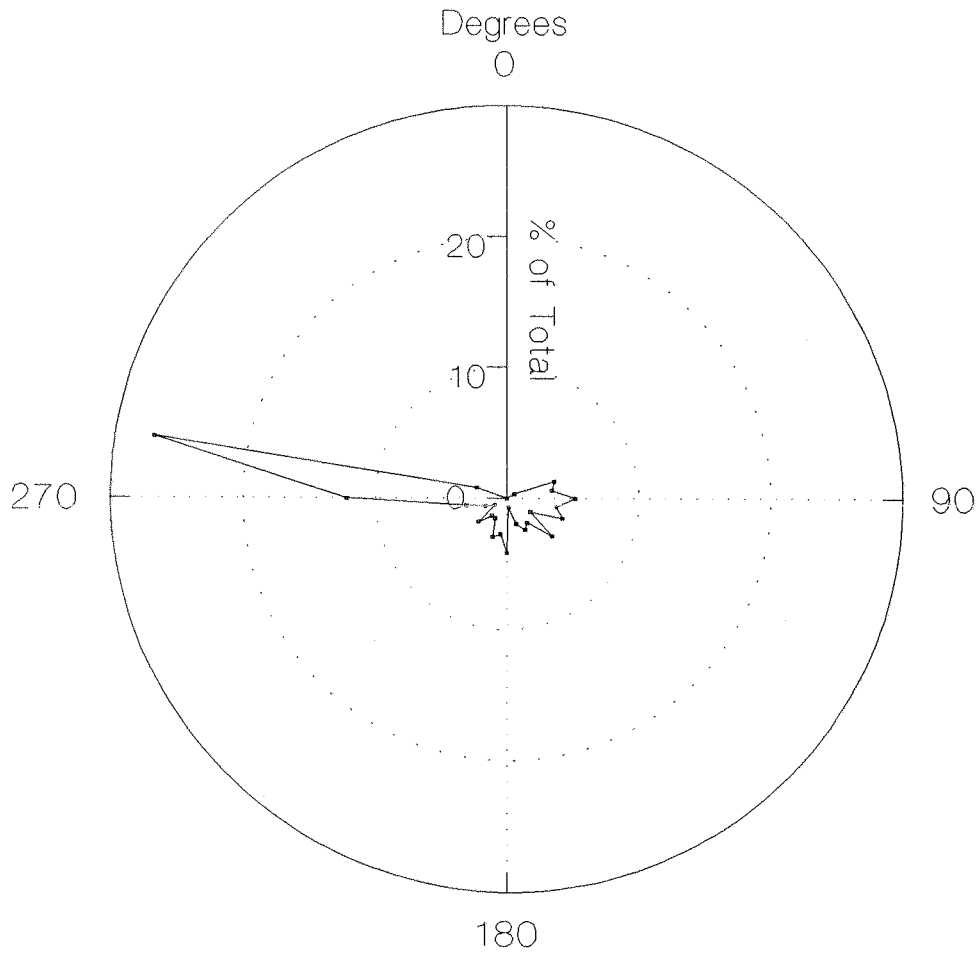
Chile 1988 - Summit



Wind Direction Frequency Distribution

CHILE SUMMIT 1988

Degrees	Counts	% of total	Direction	Degrees	Counts	% of total
10	0	0.00	NE	45	0	0.00
20	0	0.00	E	90	38	13.19
30	0	0.00	SE	135	46	15.97
40	0	0.00	S	180	32	11.11
50	0	0.00	SW	225	30	10.42
60	2	0.69	W	270	57	19.79
70	11	3.82	NW	315	85	29.51
80	10	3.47	N	360	0	0.00
90	15	5.21			0	
100	11	3.82				
110	13	4.51		Sum:	288	100
120	6	2.08				
130	13	4.51				
140	7	2.43				
150	8	2.78				
160	6	2.08				
170	2	0.69				
180	12	4.17				
190	8	2.78				
200	9	3.13				
210	5	1.74				
220	5	1.74				
230	8	2.78				
240	3	1.04				
250	5	1.74				
260	9	3.13				
270	35	12.15				
280	78	27.08				
290	7	2.43				
300	0	0.00				
310	0	0.00				
320	0	0.00				
330	0	0.00				
340	0	0.00				
350	0	0.00				
360	0	0.00				
	0					
Sum:	288	100				



Chile 1988 - Summit, Frequency distribution for wind direction (Systat filename: ES8WD1.SYS)

### Diurnal Variation of Wind Direction Chile 1988 - Summit



**FILE: ESSHRMP.WQ1**  
**Chile 1988 - Summit**  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

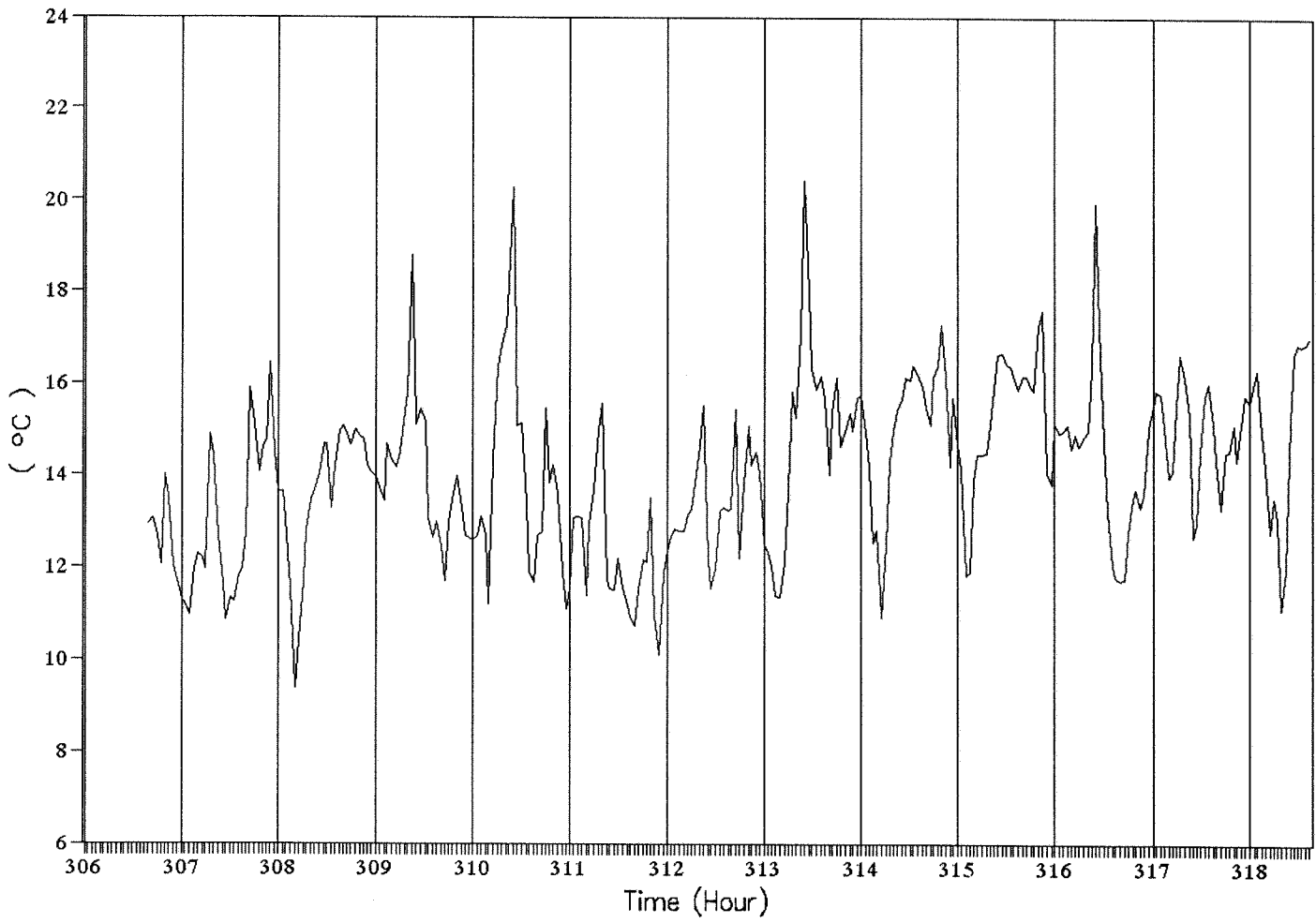
<u>Temperature</u> <u>TIME/ID</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100		11.3	14.5	14.1	12.6	11.1	11.9	14.1	15.7	15.7	13.8	15.0	15.8
200		11.2	13.6	13.9	12.6	11.5	12.4	12.5	15.8	14.7	15.1	15.5	15.6
300		11.0	13.6	13.7	12.7	13.1	12.7	12.3	14.9	14.1	14.9	15.8	16.1
400		12.0	13.0	13.4	13.1	13.1	12.9	12.0	14.2	11.8	15.0	15.8	16.3
500		12.3	11.5	14.7	12.7	13.1	12.8	11.4	12.5	11.9	15.1	15.1	15.0
600		12.2	9.4	14.3	11.2	11.4	12.8	11.3	12.8	13.9	14.6	13.9	14.1
700		11.9	10.4	14.2	14.3	12.9	13.2	12.1	10.9	14.4	14.9	14.1	12.8
800		14.9	11.7	14.5	16.4	13.7	13.2	13.7	12.5	14.4	14.6	15.5	13.5
900		14.4	12.8	15.4	16.9	15.0	13.8	15.8	14.3	14.5	14.9	16.6	13.0
1000		12.7	13.5	15.8	17.2	15.6	14.7	15.2	15.0	15.1	15.0	16.1	11.1
1100		11.6	13.7	18.8	18.2	11.7	15.5	17.1	15.4	15.9	16.3	15.3	12.0
1200			14.0	15.1	20.3	11.5	12.2	20.5	15.6	16.6	19.9	12.7	15.2
1300			14.7	15.4	15.1	11.5	11.5	18.0	16.1	16.7	17.2	12.9	16.6
1400			14.7	15.2	15.1	12.2	11.9	16.3	16.1	16.4	14.7	14.5	16.9
1500			13.3	13.0	13.4	11.5	13.2	15.9	16.4	16.4	13.2	15.7	16.8
1600			11.8	14.2	12.6	11.2	13.3	16.2	16.2	16.2	12.1	16.0	16.9
1700	12.9	12.0	15.0	13.0	11.7	10.9	13.2	15.7	15.9	15.9	11.8	15.1	17.0
1800	13.1	12.7	15.1	12.4	12.7	10.7	13.3	14.0	15.5	16.2	11.7	14.4	
1900	12.7	15.9	14.9	11.7	12.7	11.5	15.4	15.4	15.1	16.2	11.7	13.3	
2000	12.1	15.1	14.7	13.0	15.5	12.2	12.2	16.1	16.1	15.9	12.8	14.5	
2100	14.0	14.1	15.0	13.5	13.8	12.1	13.8	14.6	16.4	15.8	13.5	14.5	
2200	13.5	14.6	14.8	14.0	14.2	13.5	15.1	15.0	17.3	17.3	13.7	15.1	
2300	12.0	14.7	14.8	13.3	13.6	11.0	14.2	15.3	16.2	17.6	13.3	14.3	
0	11.7	16.4	14.2	12.7	11.9	10.1	14.5	15.0	14.2	14.0	13.6	15.1	
Daily Average:	12.7	12.9	13.6	14.1	14.1	12.2	13.3	14.8	15.0	15.3	14.3	14.9	15.0

**Summit - 1988**

Average:	14.1	Maximum Daily Average:	15.3
Maximum:	20.5	Minimum Daily Average:	12.2
Minimum:	9.4		
Std.Dev:	1.9		

# Temperature

## Chile 1988 - Summit



**FILE: ES8HRMP.WQ1**  
**Chile 1988 - Summit**  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

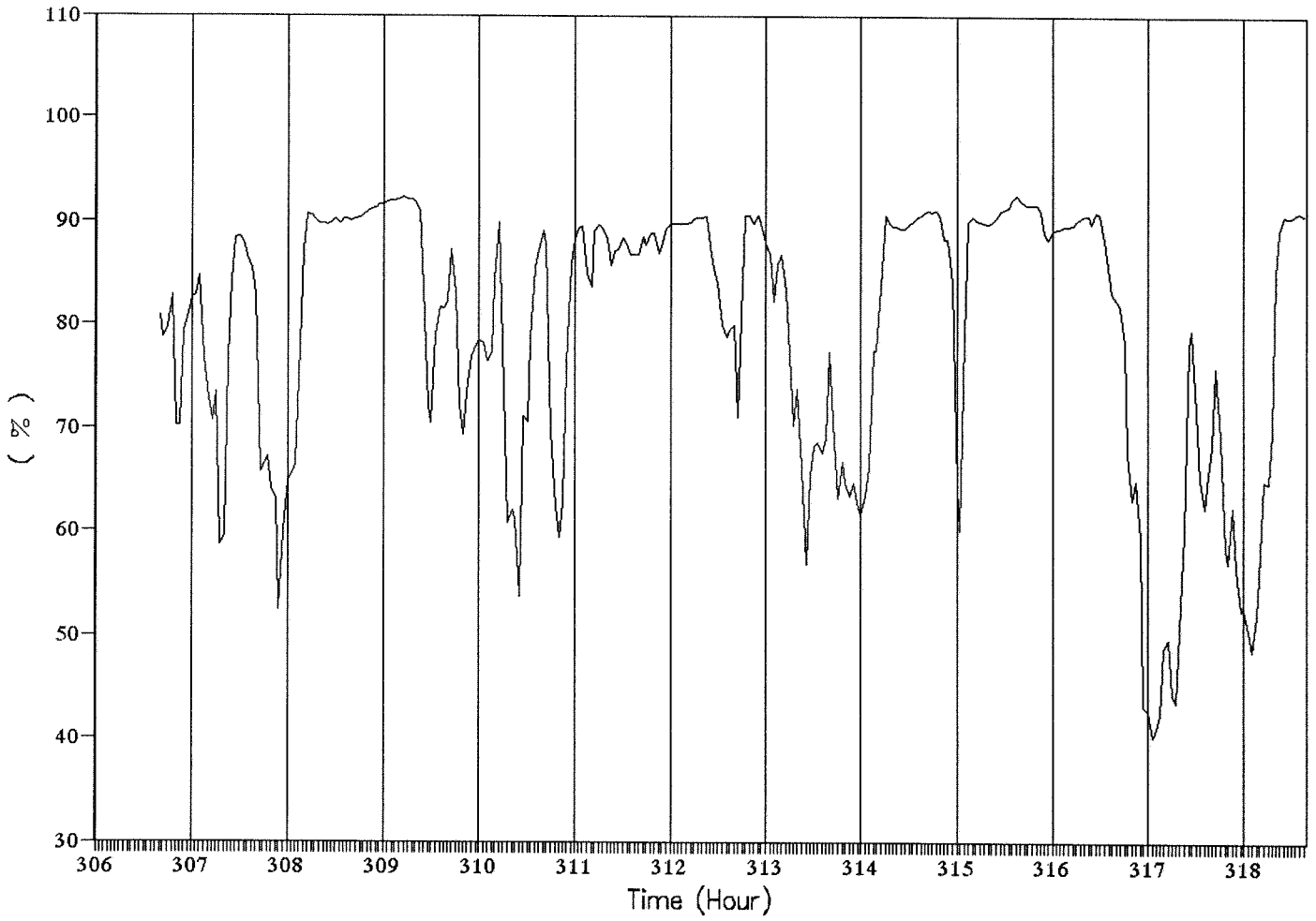
<u>Relative Humidity</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
TIME/JD	306												
100	82.5	59.8	64.8	91.5	78.0	85.9	89.3	89.9	62.2	84.0	88.3	43.2	52.4
200	82.7	64.8	65.5	91.6	78.6	88.3	89.8	88.0	61.5	64.1	89.1	42.5	52.7
300	84.7	65.5	66.4	91.8	78.2	89.3	89.8	86.7	63.5	60.0	89.4	40.1	50.3
400	76.9	66.4	74.9	92.0	76.5	89.5	89.7	82.3	66.1	78.9	89.3	41.0	48.4
500	72.8	74.9	87.1	92.0	77.2	84.8	89.8	85.8	77.5	90.0	89.4	42.3	51.9
600	70.7	87.1	90.7	92.1	84.2	83.6	89.8	86.7	77.5	90.5	89.4	48.7	55.7
700	73.5	90.7	90.7	92.2	89.8	89.0	89.9	83.2	83.7	90.2	89.6	49.5	64.9
800	58.5	90.7	90.7	92.2	77.9	89.7	90.1	77.1	90.6	90.1	90.1	44.3	64.5
900	59.5	90.1	89.4	92.1	60.7	89.4	90.3	70.1	89.9	89.9	90.3	43.5	69.7
1000	76.6	89.8	89.7	91.9	61.9	88.2	90.3	73.8	89.5	89.7	90.6	50.5	85.0
1100	84.3	89.7	89.6	91.1	61.0	85.8	90.4	66.0	89.4	89.9	90.6	59.9	89.1
1200		89.6	89.6	83.5	53.5	87.1	87.6	56.8	89.4	90.3	89.8	78.1	90.7
1300	88.4	89.8	89.8	72.1	71.1	87.3	85.3	65.4	89.3	90.9	90.9	79.4	90.4
1400	88.5	90.2	90.2	70.4	70.6	88.3	84.0	68.2	89.7	91.2	90.7	71.6	90.5
1500	87.5	89.7	89.7	79.0	78.4	87.3	79.8	68.6	89.9	91.4	88.2	65.0	90.8
1600	86.6	90.2	90.2	81.7	85.5	86.7	78.8	67.5	90.3	92.1	84.7	62.3	90.9
1700	85.3	90.1	90.1	81.6	87.3	86.7	79.5	69.1	90.6	92.5	83.0	65.6	90.8
1800	82.8	90.0	90.0	82.2	89.0	86.7	79.8	77.4	90.8	92.2	82.4	68.4	
1900	65.6	90.2	90.2	87.2	87.6	88.6	71.0	70.7	91.0	91.7	81.7	75.8	
2000	66.1	90.3	90.3	83.1	69.6	87.7	84.0	63.2	90.9	91.6	78.4	69.0	
2100	67.3	90.5	90.5	72.1	62.4	88.8	90.6	66.6	91.0	91.6	67.5	58.4	
2200	64.0	90.9	90.9	69.3	59.3	88.8	90.5	64.5	90.3	91.5	63.1	57.0	
2300	63.1	91.1	91.1	73.5	62.8	86.8	89.7	63.3	88.2	91.0	64.9	62.3	
0	52.3	91.3	91.3	76.9	76.2	87.5	90.6	64.6	88.3	88.8	59.3	56.4	
Daily													
Average:	77.8	85.1	85.1	84.3	74.1	87.6	86.7	73.1	84.2	87.7	83.8	57.3	72.3

**Summit - 1988**

Average:	79.4	Maximum Daily Average:	87.7
Maximum:	92.5	Minimum Daily Average:	57.3
Minimum:	40.1		
Std.Dev:	13.0		

# Relative Humidity

Chile 1988 - Summit



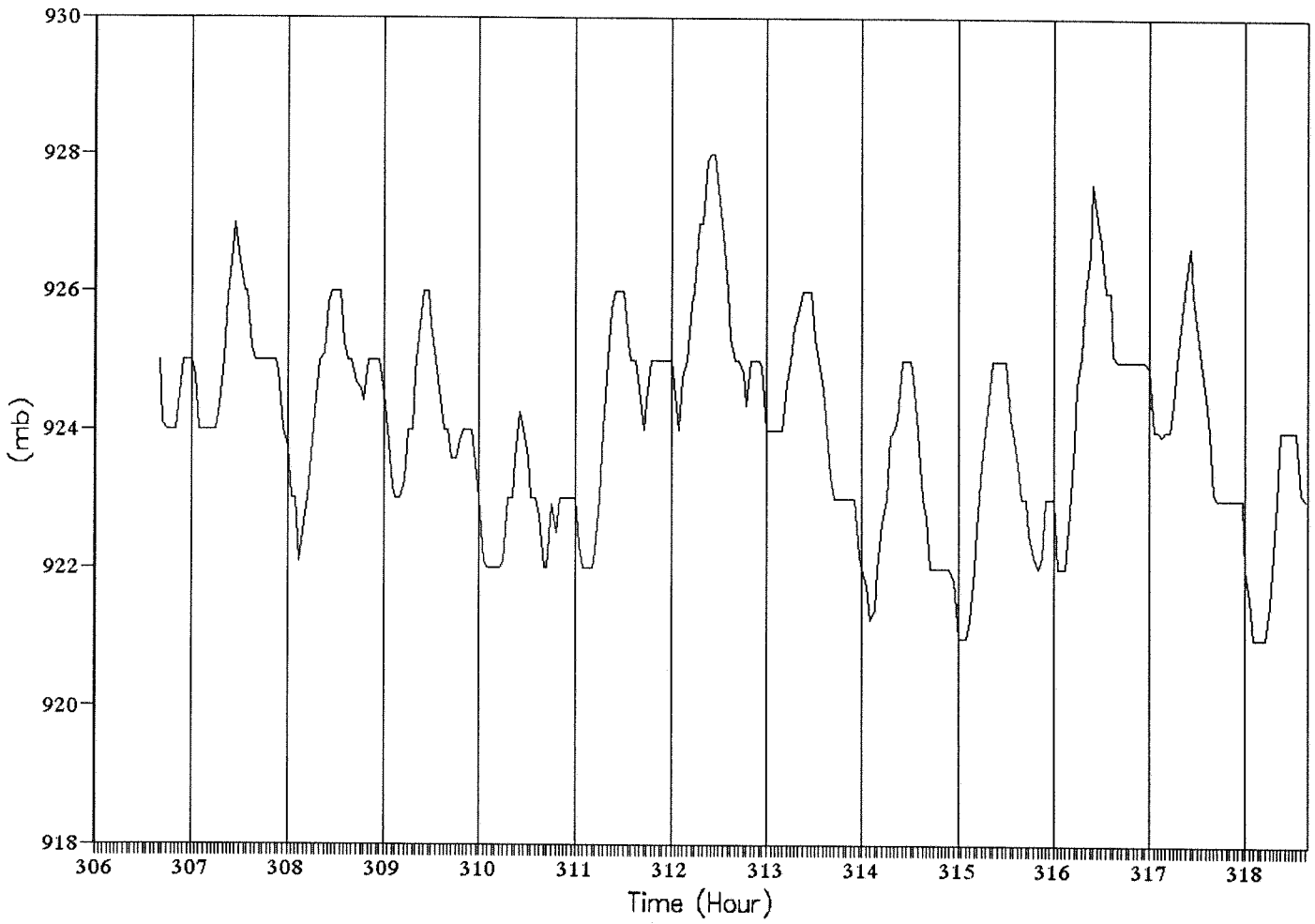
**FILE: ES8HRMP.WQ1**  
**Chile 1988 - Summit**  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

<u>Pressure</u>	<u>TIME/JD</u>	306	307	308	309	310	311	312	313	314	315	316	317	318
100		925	925	924	925	923	923	925	925	922	922	923	925	318
200		925	924	924	925	923	923	925	924	922	921	923	925	923
300		924	923	923	924	922	922	925	924	922	921	922	924	922
400		924	923	923	923	922	922	924	924	921	921	922	924	921
500		924	922	922	923	922	922	925	924	921	921	922	924	921
600		924	923	923	923	922	922	925	924	922	922	923	924	921
700		924	923	923	923	922	922	926	925	923	923	924	924	921
800		924	924	924	924	922	923	926	925	923	924	925	924	922
900		925	924	924	924	923	924	927	926	924	924	925	925	922
1000		926	925	925	925	923	925	927	926	924	925	926	926	923
1100		926	925	925	926	924	926	928	926	924	925	927	926	924
1200				926	926	924	926	928	926	925	925	928	927	924
1300		927	926	926	926	924	926	928	926	925	925	927	926	924
1400		926	926	926	926	924	926	928	926	925	925	927	926	924
1500		926	926	926	925	923	925	927	925	925	925	927	925	924
1600		926	925	925	924	923	925	926	925	924	924	926	925	924
1700	925	925	925	925	924	923	925	925	924	923	924	925	924	923
1800	924	925	925	925	924	922	925	925	923	923	923	925	923	
1900	924	925	925	925	924	922	924	925	923	922	923	925	923	
2000	924	925	925	925	924	923	924	925	923	922	923	925	923	
2100	924	925	924	924	924	923	925	924	923	922	923	925	923	
2200	925	925	925	924	924	923	925	925	923	922	922	925	923	
2300	925	925	925	924	924	923	925	925	923	922	922	925	923	
0		925	925	925	924	923	925	925	923	922	923	925	923	
Daily														
Average:	924	925	924	924	924	923	924	926	924	923	923	925	924	923

**Summit - 1988**

Average:	924	Maximum Daily Average:	926
Maximum:	928	Minimum Daily Average:	923
Minimum:	921		
Std.Dev:	1		

# Pressure Chile 1988 - Summit

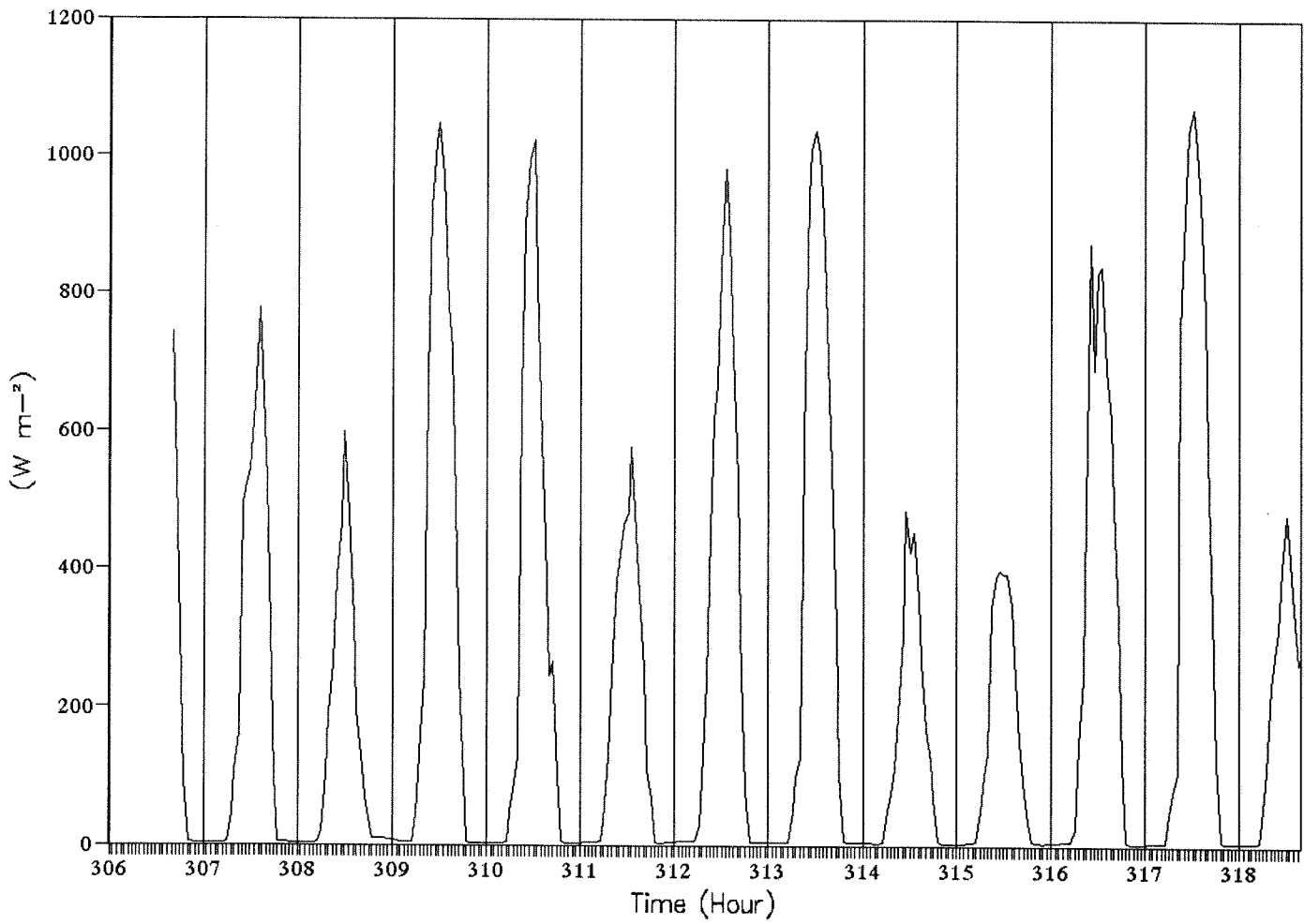


FILE: ES8HRMP.WQ1  
 Chile 1988 - Summit  
 Hourly T/RH/R/p data  
 Period: November 1 - 13

<u>Solar Radiation</u>													
TIME/JD	306	307	308	309	310	311	312	313	314	315	316	317	318
100		2	2	8	2	2	4	3	2	2	2	2	2
200		2	2	7	2	2	4	3	2	2	3	2	2
300		2	2	6	2	2	5	3	2	2	4	2	2
400		2	2	4	2	3	5	2	2	2	4	2	2
500		2	2	2	2	2	5	2	2	3	5	2	2
600		2	2	2	2	3	5	2	2	3	5	2	2
700		3	3	4	4	4	5	4	4	4	5	4	4
800		45	20	43	47	35	28	48	50	51	23	47	53
900		107	101	159	91	129	94	100	74	103	147	77	110
1000		160	188	238	127	247	238	127	111	132	245	105	233
1100		495	262	672	651	384	453	585	189	342	489	751	276
1200		387	387	925	901	407	618	942	304	390	874	915	313
1300		523	467	1020	995	464	670	1011	485	397	689	1037	405
1400		543	597	1046	1024	481	884	1037	425	394	832	1070	478
1500		638	479	971	816	576	982	1004	453	394	840	1036	437
1600		777	325	779	586	452	884	910	358	347	691	937	344
1700	745	694	192	716	443	362	710	756	268	272	618	775	263
1800	537	525	129	497	246	256	528	545	168	152	492	566	
1900	308	313	71	246	265	108	307	314	122	74	331	339	
2000	94	97	26	90	98	66	78	103	68	32	121	122	
2100	4	4	10	4	4	4	3	5	4	5	6	7	
2200	2	2	9	2	2	2	3	2	2	2	2	2	
2300	2	2	10	2	2	2	3	2	2	2	2	2	
0	2	2	10	2	2	2	3	2	2	2	2	2	
Daily Average:	212	215	137	310	263	166	272	313	129	130	268	325	172
<b>Daily maximum hourly solar radiation</b>													
Summit - 1988													
Average:	226		Maximum Daily Average:	325						Average:	776		
Maximum:	1070		Minimum Daily Average:	129						Maximum:	1070		
Minimum:	2									Minimum:	397		
Std.Dev:	305									Min/Max:	0.37		
Daily Maximum:	745	777	597	1046	1024	576	982	1037	485	397	874	1070	478

# Solar Radiation

Chile 1988 - Summit



**CHILE METEOROLOGICAL DATA**

Year: 1989

Site: RIDGE

Period: 308-311

Average and maximum/minimum of the meteorological parameters for  
November 4 -7, 1989;  
 (15 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)
Average	2.60	218	10.9	71	931
Maximum	5.80	349	17.5	80	934
Minimum	0.41	14	8.8	26	927

Average and maximum/minimum of the meteorological parameters for  
November 4 -7, 1989 when wind direction was  $270^{\circ} \pm 20^{\circ}$ ;  
 (15 minute average data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)
Average	3.30	258	10.8	74	931
Maximum	5.80	288	16.4	80	934
Minimum	0.41	250	9.0	27	927

**CHILE METEOROLOGICAL DATA**

Year: 1989  
 Site: RIDGE  
 Period: 308-311

Hourly average and hourly maximum/minimum of the meteorological parameters for  
 November 4 -7 :

(from 15 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )
Average	2.60	219	10.9	71	931	157
Maximum	5.43	277	17.2	80	934	983
Minimum	0.47	50	9.1	27	927	1

Average and maximum/minimum of the meteorological parameters for  
 November 4 -7 when wind direction was  $270^{\circ} \pm 20^{\circ}$ :

(from 15 minute avg data)

Parameter	$W_s$ ( $m\ s^{-1}$ )	$W_d$ ( $^{\circ}$ )	T ( $^{\circ}C$ )	RH (%)	p (mb)	R ( $W\ m^{-2}$ )
Average	3.49	257	10.7	76	931	206
Maximum	5.43	277	14.2	80	934	983
Minimum	0.78	250	9.4	63	927	1

**FILE: ER9HRWS.WQ1**  
**Chile 1989 - Ridge**  
 Hourly Ws data  
 Period: November 4 - 7

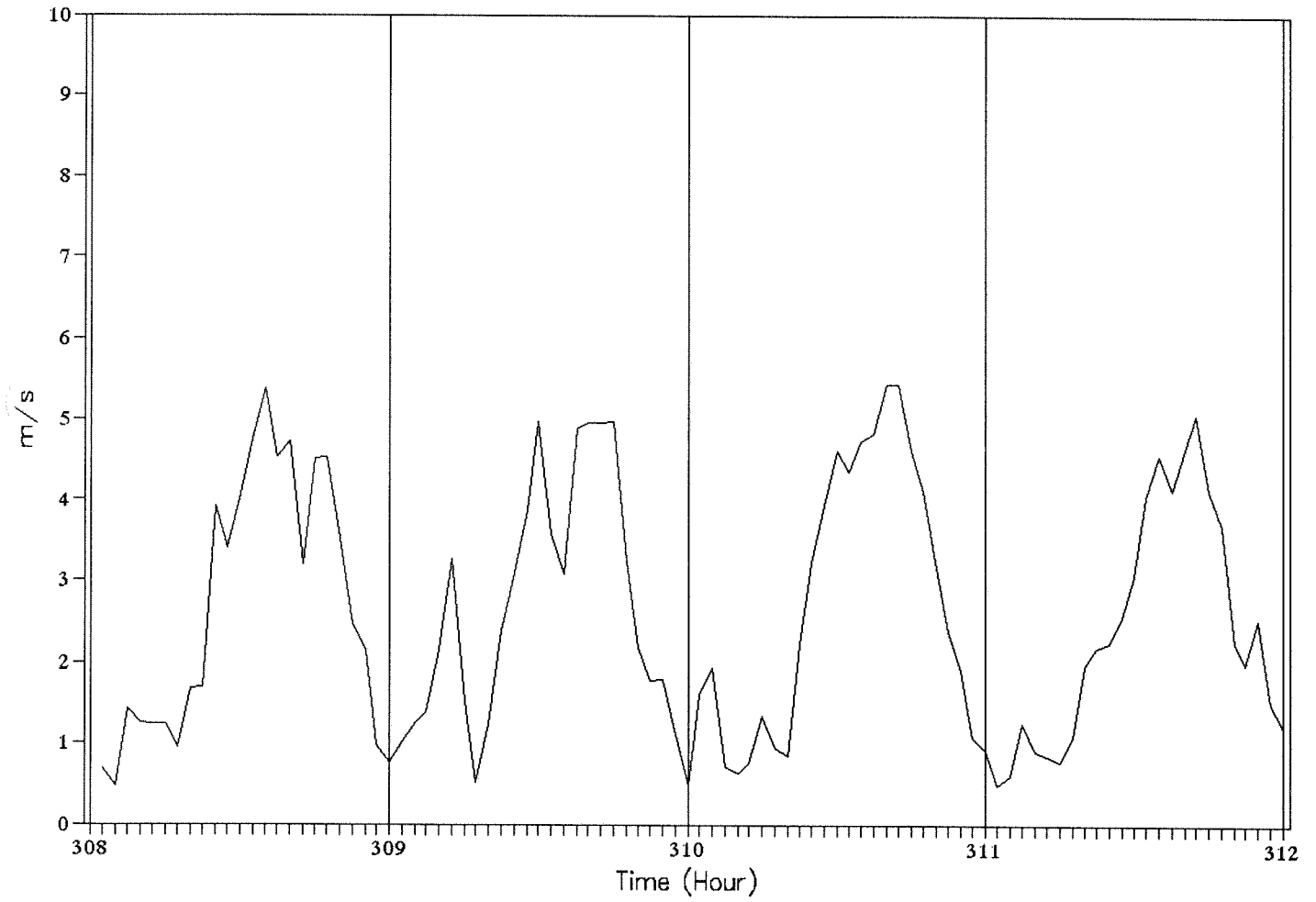
<u>Wind Speed</u> <u>TIME/JD</u>	308	309	310	311
100	0.69	1.01	1.59	0.49
200	0.47	1.24	1.93	0.59
300	1.42	1.38	0.70	1.23
400	1.25	2.15	0.62	0.90
500	1.22	3.26	0.76	0.84
600	1.22	1.51	1.32	0.78
700	0.95	0.51	0.94	1.10
800	1.65	1.23	0.85	1.96
900	1.68	2.38	2.22	2.17
1000	3.90	3.09	3.21	2.24
1100	3.38	3.86	3.93	2.56
1200	4.05	4.96	4.59	3.05
1300	4.80	3.56	4.34	4.04
1400	5.37	3.07	4.73	4.54
1500	4.52	4.87	4.82	4.12
1600	4.72	4.96	5.43	4.63
1700	3.19	4.96	5.43	5.05
1800	4.50	4.97	4.59	4.11
1900	4.52	3.23	4.10	3.68
2000	3.50	2.17	3.16	2.24
2100	2.44	1.76	2.38	1.97
2200	2.13	1.79	1.90	2.52
2300	0.97	1.10	1.07	1.49
0	0.75	0.48	0.91	1.21
Daily Average:	2.64	2.65	2.73	2.40

**Ridge - 1989**

Average:	2.60	Maximum Daily Average:	2.73
Maximum:	5.43	Minimum Daily Average:	2.40
Minimum:	0.47		
Std.Dev:	1.54		

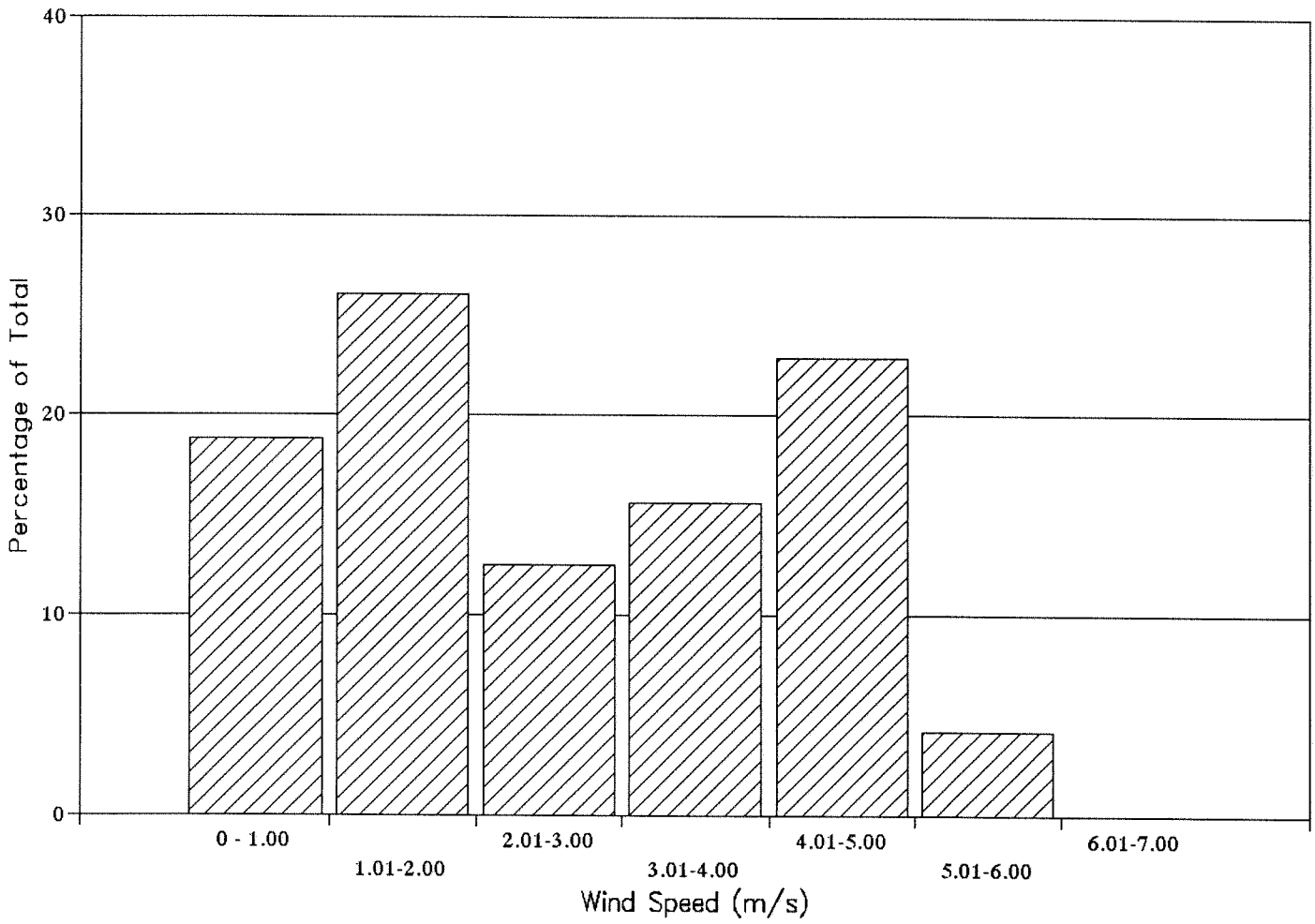
# Wind Speed

Chile 1989 - Ridge



# Frequency Distribution of Wind Speed

Chile 1989 - Ridge



# Diurnal Cycle of Wind Speed

Chile 1989 - Ridge

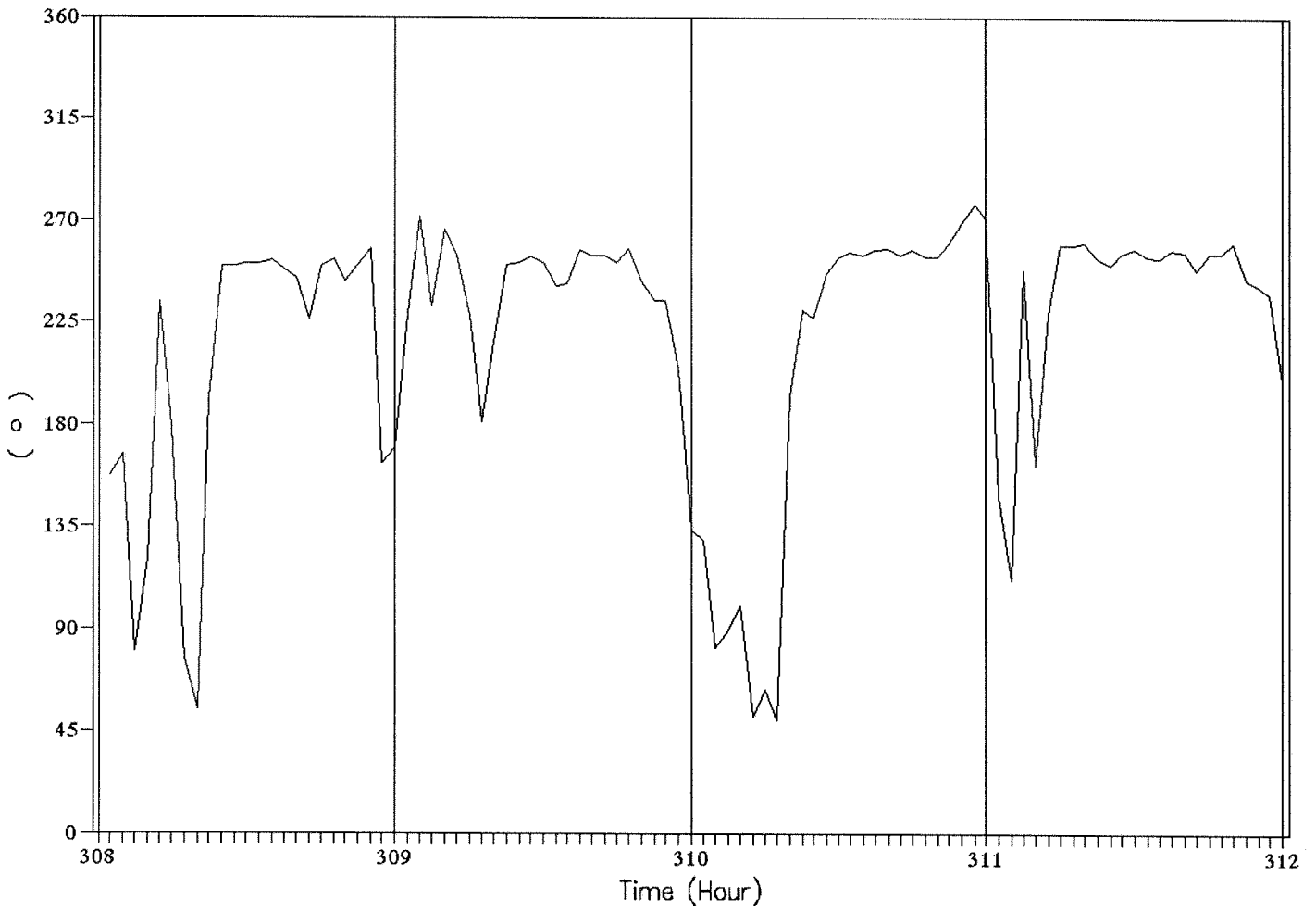


File: ER9HRWD.WQ1  
 Chile 1989 - Ridge  
 Hourly Wd data  
 Period: November 4 - 7

<u>Wind Direction</u> <u>TIME/ID</u>	308	309	310	311
100	158	228	129	149
200	167	271	81	111
300	80	232	89	248
400	120	266	100	162
500	234	254	51	229
600	178	228	63	259
700	76	181	50	259
800	54	216	192	260
900	191	250	230	253
1000	250	251	227	250
1100	250	254	246	255
1200	251	252	253	258
1300	250	241	256	254
1400	252	242	254	253
1500	248	257	257	257
1600	245	255	258	255
1700	226	255	254	248
1800	250	251	257	255
1900	252	258	254	255
2000	242	243	254	260
2100	250	235	260	244
2200	258	235	269	241
2300	162	205	277	238
0	169	134	271	199
Daily Average:	201	237	201	236

**Ridge - 1989**  
 Average: 219      Maximum Daily Average: 237  
 Maximum: 277      Minimum Daily Average: 201  
 Minimum: 50  
 Std.Dev: 59

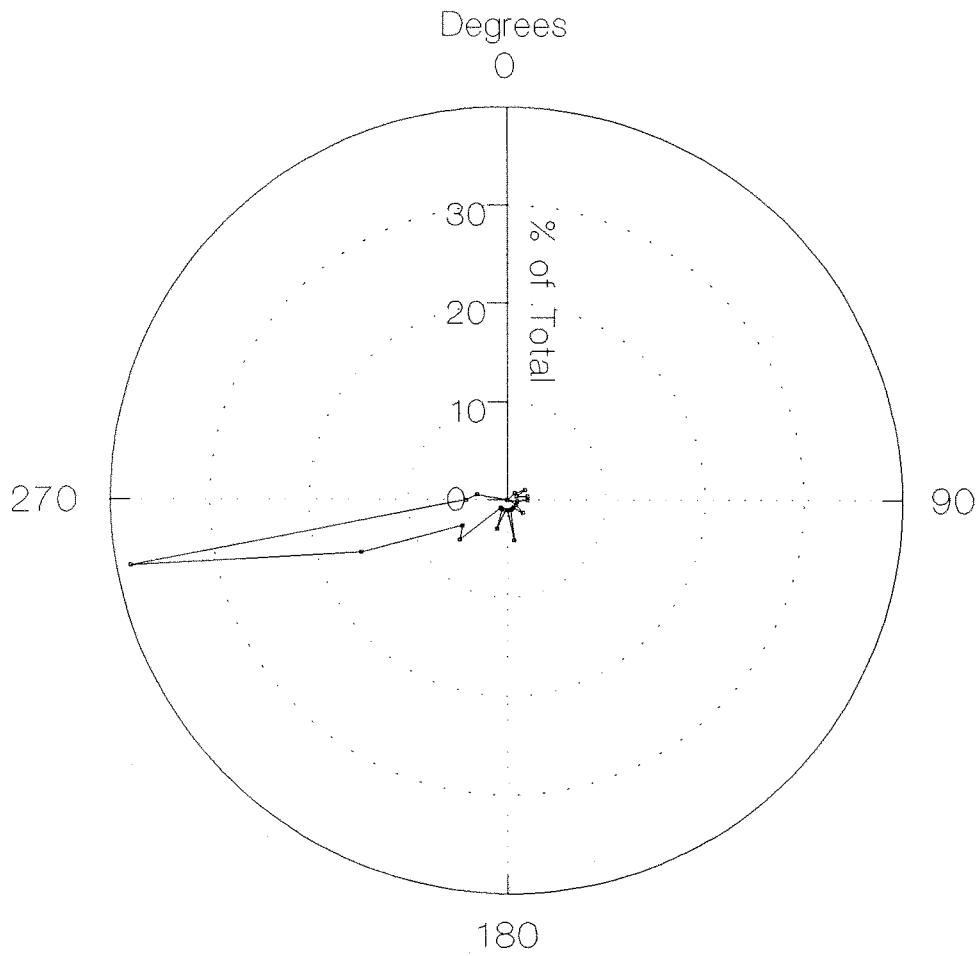
# Wind Direction Chile 1989 - Ridge



Wind Direction Frequency Distribution

CHILE RIDGE 1989

Degrees	Counts	% of Total	Direction	Degrees	Counts	% of Total
10	0	0	NE	45	0	0.00
20	0	0.00	E	90	8	8.33
30	0	0.00	SE	135	5	5.21
40	0	0.00	S	180	7	7.29
50	1	1.04	SW	225	6	6.25
60	2	2.08	W	270	67	69.79
70	1	1.04	NW	315	3	3.13
80	2	2.08	N	360	0	0.00
90	2	2.08			0	
100	1	1.04				
110	0	0.00		Sum:	96	100
120	1	1.04				
130	2	2.08				
140	1	1.04				
150	1	1.04				
160	1	1.04				
170	4	4.17				
180	1	1.04				
190	1	1.04				
200	3	3.13				
210	1	1.04				
220	1	1.04				
230	6	6.25				
240	5	5.21				
250	15	15.63				
260	37	38.54				
270	4	4.17				
280	3	3.13				
290	0	0.00				
300	0	0.00				
310	0	0.00				
320	0	0.00				
330	0	0.00				
340	0	0.00				
350	0	0.00				
360	0	0.00				
	0					
Sum:	96	100				



Chile 1989 - Ridge, Frequency distribution for wind direction (Systat filename: ER9WD1.SYS)

### Diurnal Variation of Wind Direction Chile 1989 - Ridge

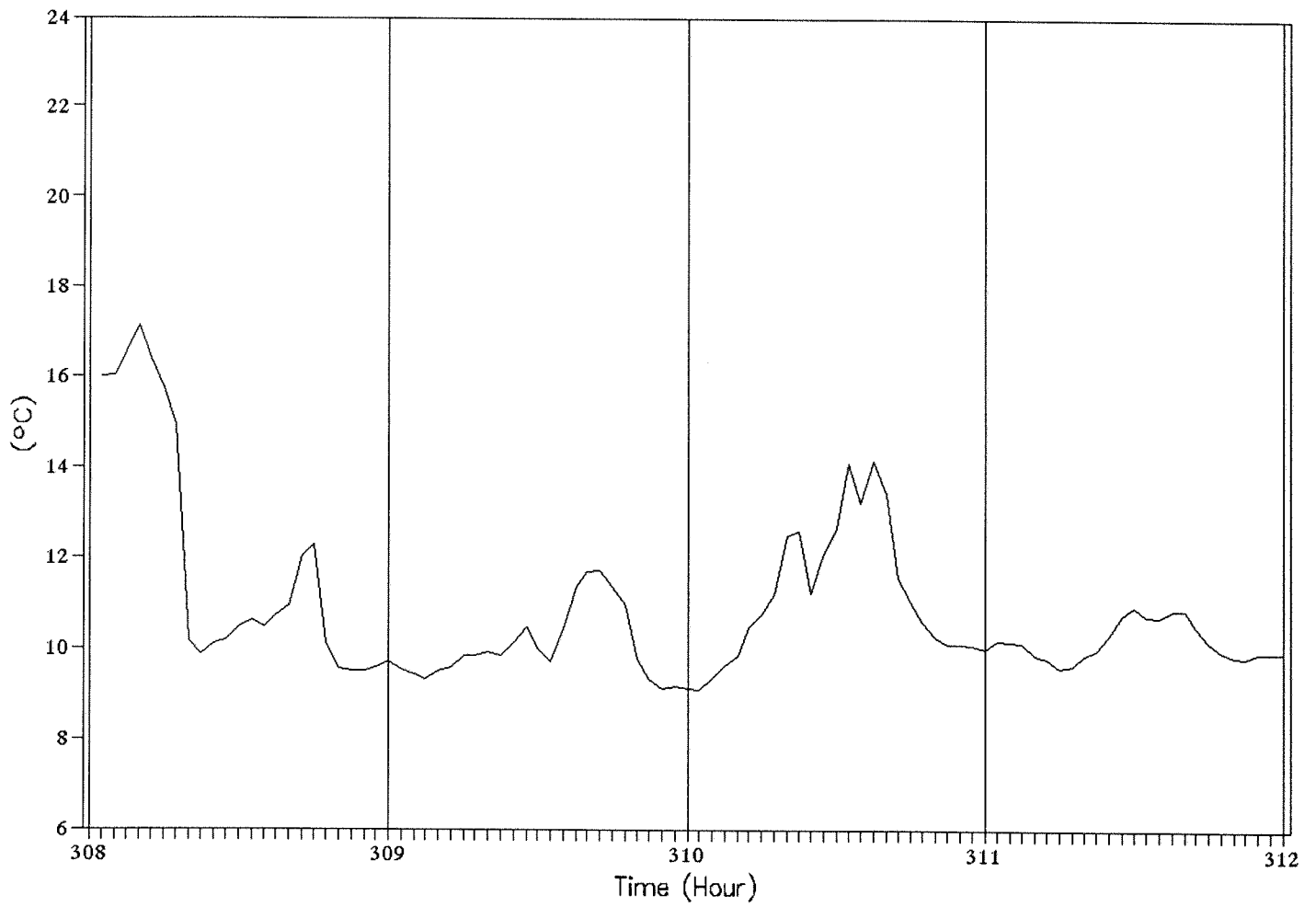


File: ER9HRMP.WQ1  
 CHILE 1989 - Ridge  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Temperature</u> <u>TIME/JD</u>	308	309	310	311
100	16.0	9.5	9.1	10.2
200	16.0	9.4	9.3	10.2
300	16.6	9.3	9.6	10.1
400	17.2	9.5	9.8	9.9
500	16.4	9.6	10.5	9.8
600	15.8	9.8	10.8	9.6
700	15.0	9.9	11.2	9.6
800	10.2	9.9	12.5	9.9
900	9.9	9.9	12.6	10.0
1000	10.1	10.1	11.2	10.3
1100	10.2	10.5	12.1	10.8
1200	10.5	10.0	12.7	10.9
1300	10.6	9.7	14.1	10.7
1400	10.5	10.4	13.2	10.7
1500	10.7	11.4	14.2	10.8
1600	10.9	11.7	13.5	10.9
1700	12.0	11.7	11.6	10.5
1800	12.3	11.3	11.0	10.2
1900	10.1	11.0	10.6	9.9
2000	9.6	9.8	10.3	9.9
2100	9.5	9.3	10.1	9.8
2200	9.5	9.1	10.1	9.9
2300	9.6	9.2	10.1	9.9
0	9.7	9.1	10.0	9.9
Daily Average:	12.0	10.0	11.2	10.2

**Ridge - 1989**  
 Average: 10.9      Maximum Daily Average: 12.0  
 Maximum: 17.2      Minimum Daily Average: 10.0  
 Minimum: 9.1  
 Std.Dev: 1.8

# Temperature Chile 1989 - Ridge



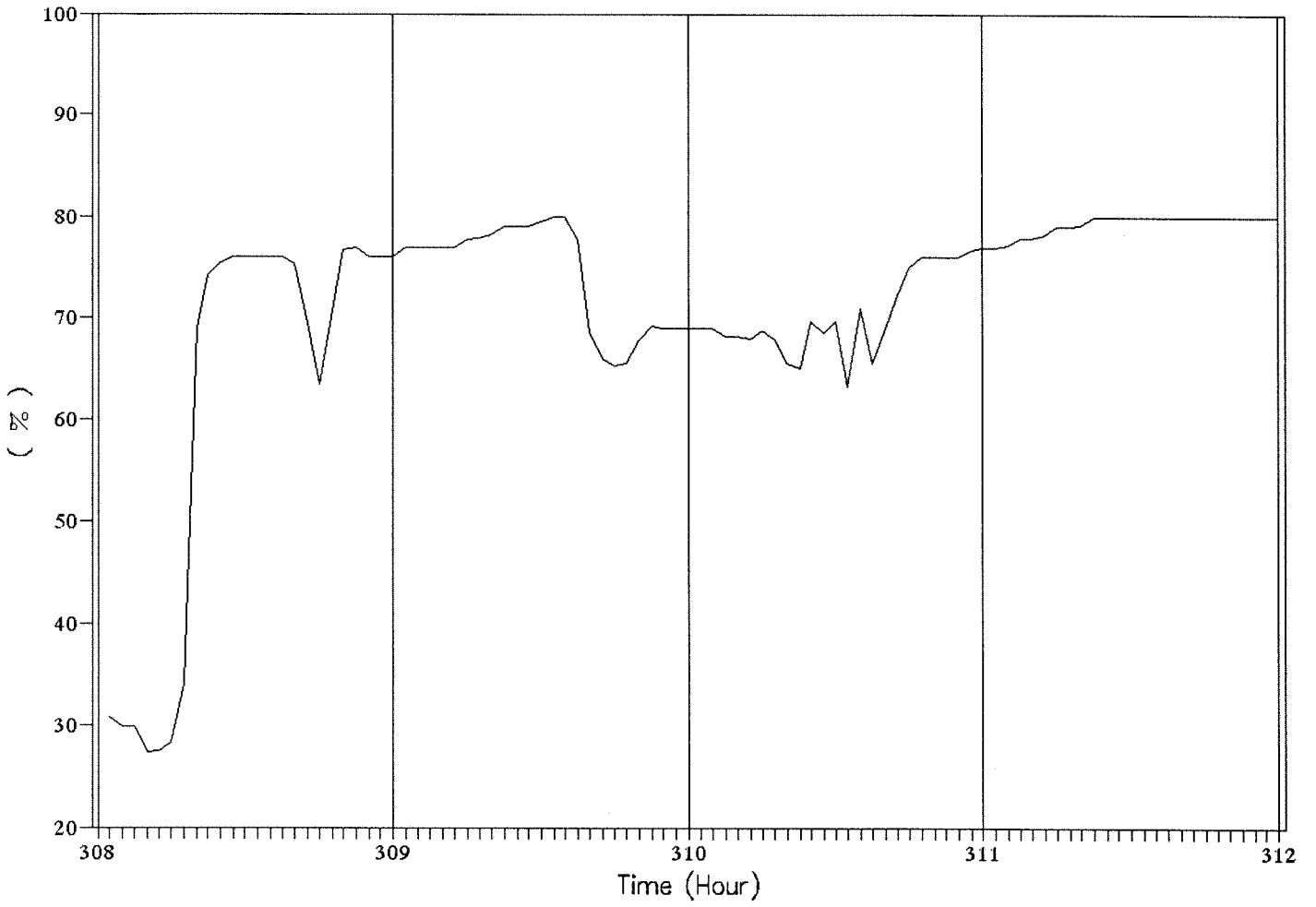
File: ER9HRMP.WQ1  
 CHILE 1989 - Ridge  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Relative Humidity</u>	308	309	310	311
TIME/ID				
100	31	77	69	77
200	30	77	69	77
300	30	77	68	78
400	27	77	68	78
500	28	77	68	78
600	28	78	69	79
700	34	78	68	79
800	69	78	66	79
900	74	79	65	80
1000	76	79	70	80
1100	76	79	69	80
1200	76	80	70	80
1300	76	80	63	80
1400	76	80	71	80
1500	76	78	66	80
1600	75	69	69	80
1700	70	66	72	80
1800	64	65	75	80
1900	71	66	76	80
2000	77	68	76	80
2100	77	69	76	80
2200	76	69	76	80
2300	76	69	77	80
0	76	69	77	80
Daily				
Average:	61.1	74.3	70.5	79.4

**Ridge - 1989**  
 Average: 71.3  
 Maximum: 80.0  
 Minimum: 27.3  
 Std.Dev: 12.7  
 Maximum Daily Average: 79.4  
 Minimum Daily Average: 61.1

# Relative Humidity

Chile 1989 - Ridge

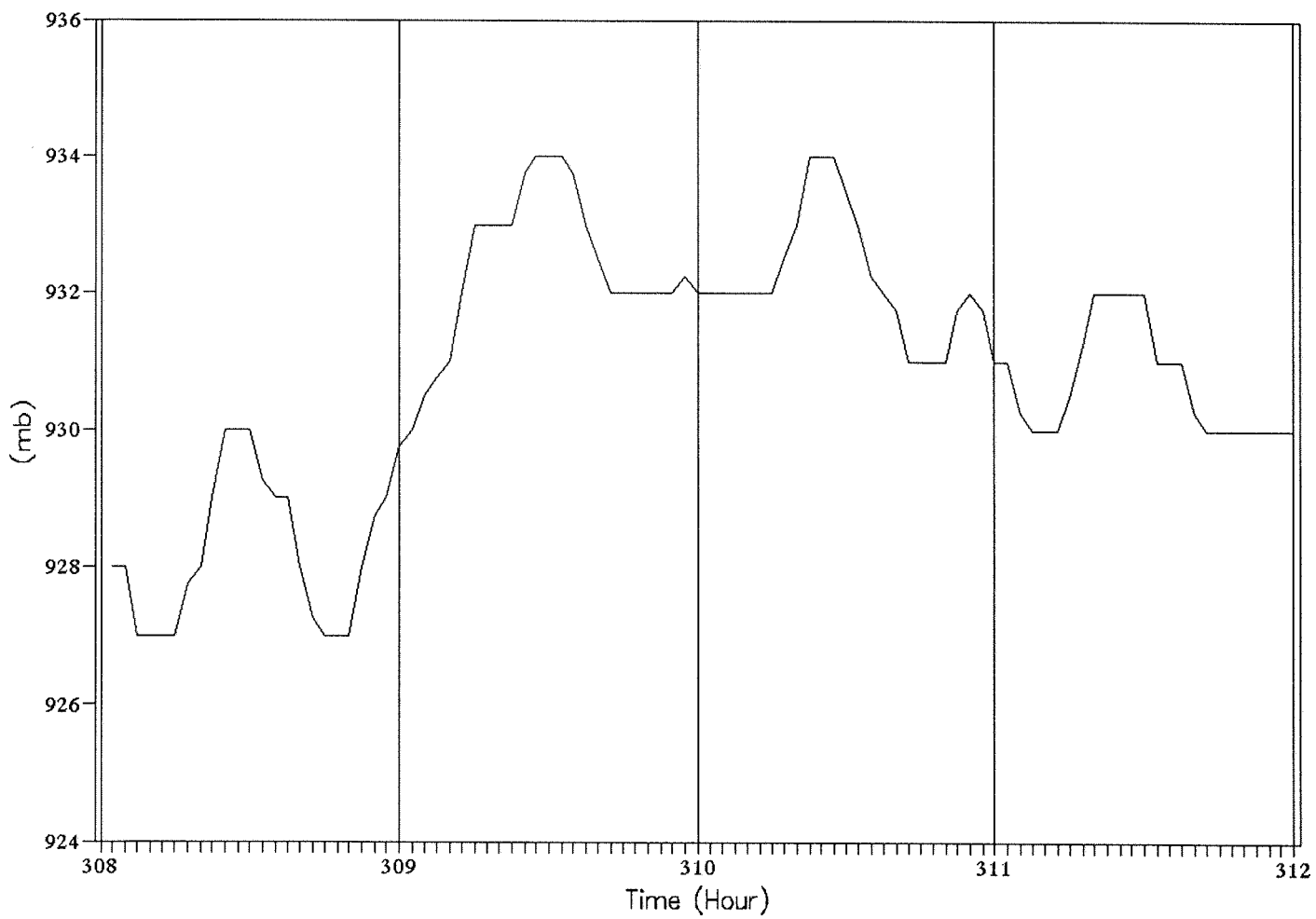


File: ER9HRMP.WQ1  
 CHILE 1989 - Ridge  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Pressure</u> TIME/JD	308	309	310	311
100	928	930	932	931
200	928	931	932	930
300	927	931	932	930
400	927	931	932	930
500	927	932	932	930
600	927	933	932	931
700	928	933	933	931
800	928	933	933	932
900	929	933	934	932
1000	930	934	934	932
1100	930	934	934	932
1200	930	934	934	932
1300	929	934	933	931
1400	929	934	932	931
1500	929	933	932	931
1600	928	933	932	930
1700	927	932	931	930
1800	927	932	931	930
1900	927	932	931	930
2000	927	932	931	930
2100	928	932	932	930
2200	929	932	932	930
2300	929	932	932	930
0	930	932	931	930
Daily Average:	928	932	932	931

**Ridge - 1989**  
 Average: 931      Maximum Daily Average: 932  
 Maximum: 934      Minimum Daily Average: 928  
 Minimum: 927  
 Std.Dev: 2

# Pressure Chile 1989 - Ridge



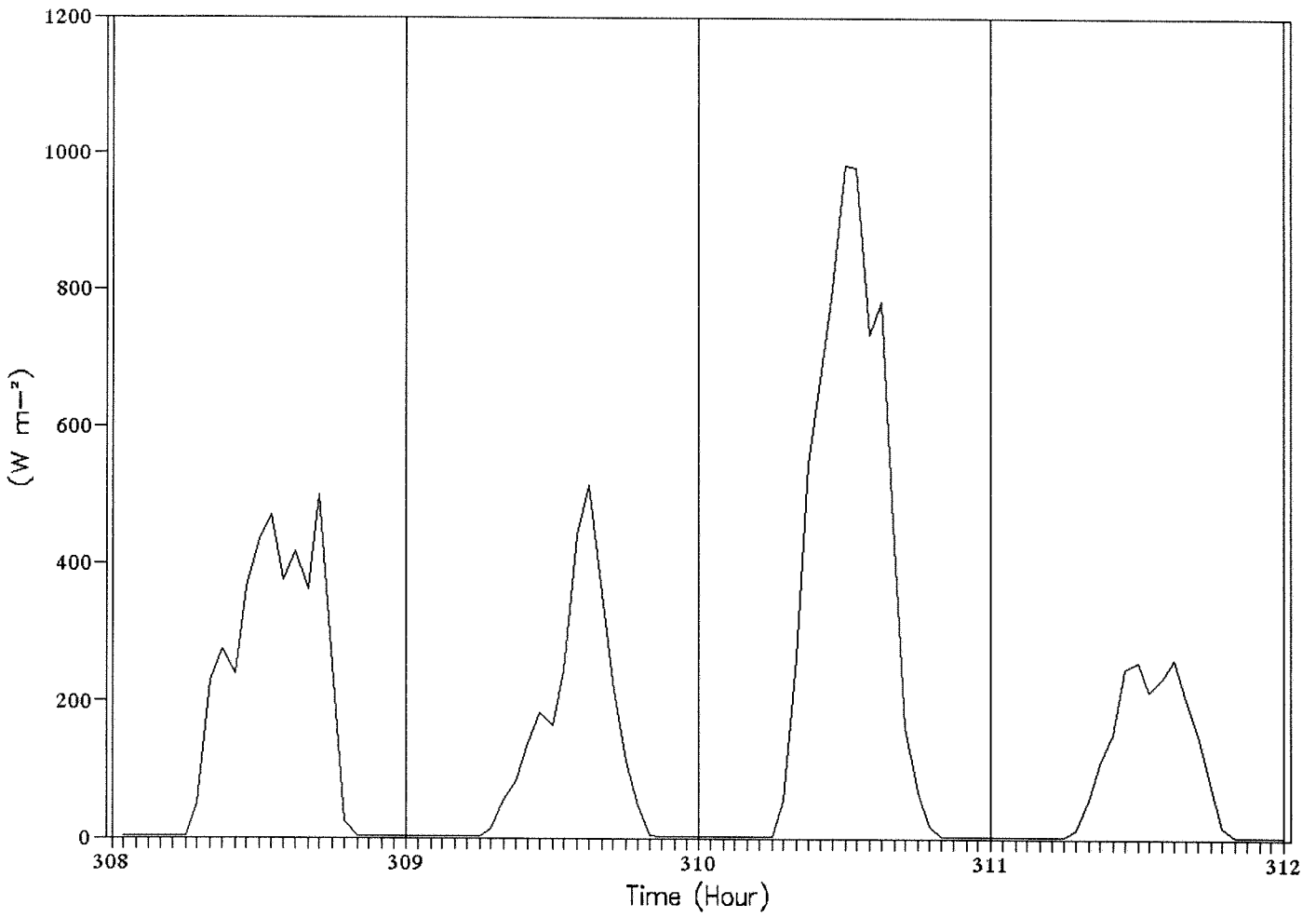
File: ER9HRMP.WQ1  
 CHILE 1989 - Ridge  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Solar Radiation</u>		308	309	310	311
<u>TIME/JD</u>					
100		1	1	1	1
200		1	1	1	1
300		1	1	1	1
400		1	1	1	1
500		1	1	1	1
600		2	1	2	1
700		50	12	54	12
800		229	56	262	58
900		275	83	546	109
1000		239	137	668	154
1100		364	183	803	247
1200		436	164	983	258
1300		470	244	979	215
1400		375	441	735	233
1500		416	515	784	259
1600		361	355	426	203
1700		501	228	161	151
1800		249	112	69	74
1900		22	47	17	17
2000		2	3	2	2
2100		1	1	1	1
2200		1	1	1	1
2300		1	1	1	1
0		1	1	1	1
Daily					
Average:		167	108	271	83
<b>Ridge - 1989</b>					
Average:		157		271	271
Maximum:		983		983	83
Minimum:		1			
Std.Dev:		230			
Daily					
Maximum:		501	515	983	259

*Daily maximum hourly solar radiation*  
 Average: 564  
 Maximum: 983  
 Minimum: 259  
 Min/Max: 0.26

# Solar Radiation

Chile 1989 - Ridge



JD	TIME	x U	y V	WS	WDmag	WDdeg	Theta	WDcorr
308	0	-1.5	-0.7	1.66	-3	-155	245	65
308	15	-1.1	0.1	1.10	3	175	-85	95
308	30	-0.6	-0.2	0.63	-3	-162	252	72
308	45	0.5	0.3	0.58	1	31	59	239
308	100	0.3	0.3	0.42	1	45	45	225
308	115	-0.1	0.4	0.41	2	104	-14	166
308	130	-0.1	0.5	0.51	2	101	-11	169
308	145	0	0.5	0.50	2	90	0	180
308	200	-0.2	0.4	0.45	2	117	-27	153
308	215	-0.7	-0.1	0.71	-3	-172	262	82
308	230	-1.1	-0.3	1.14	-3	-165	255	75
308	245	-1.7	-0.3	1.73	-3	-170	260	80
308	300	-2.1	-0.3	2.12	-3	-172	262	82
308	315	-1.9	-0.6	1.99	-3	-162	252	72
308	330	-1.4	-0.7	1.57	-3	-153	243	63
308	345	-0.9	-0.5	1.03	-3	-151	241	61
308	400	0.4	-0.1	0.41	-0	-14	104	284
308	415	0.4	-0.1	0.41	-0	-14	104	284
308	430	1	0.2	1.02	0	11	79	259
308	445	0.7	1.8	1.93	1	69	21	201
308	500	0.3	1.5	1.53	1	79	11	191
308	515	0	0.5	0.50	2	90	0	180
308	530	1.5	1.3	1.98	1	41	49	229
308	545	0.1	1.8	1.80	2	87	3	183
308	600	-0.5	0.3	0.58	3	149	-59	121
308	615	-0.6	0	0.60	3	180	-90	90
308	630	-0.6	-0.1	0.61	-3	-171	261	81
308	645	-0.9	-0.5	1.03	-3	-151	241	61
308	700	-1.5	-0.5	1.58	-3	-162	252	72
308	715	-1.5	-0.9	1.75	-3	-149	239	59
308	730	-1.2	-1.1	1.63	-2	-137	227	47
308	745	-0.8	-0.8	1.13	-2	-135	225	45
308	800	-1.9	-0.9	2.10	-3	-155	245	65
308	815	-1	-0.5	1.12	-3	-153	243	63
308	830	0.5	1.3	1.39	1	69	21	201
308	845	2	0.1	2.00	0	3	87	267
308	900	1.7	1.4	2.20	1	39	51	231
308	915	2.4	1.7	2.94	1	35	55	235
308	930	4.1	1.2	4.27	0	16	74	254
308	945	4.2	1	4.32	0	13	77	257
308	1000	3.9	1.1	4.05	0	16	74	254
308	1015	4.1	1.1	4.24	0	15	75	255
308	1030	3.2	1.5	3.53	0	25	65	245
308	1045	2.8	1	2.97	0	20	70	250
308	1100	2.6	1	2.79	0	21	69	249
308	1115	3.8	1.1	3.96	0	16	74	254
308	1130	4.2	1.2	4.37	0	16	74	254
308	1145	3.7	1.5	3.99	0	22	68	248
308	1200	3.6	1.5	3.90	0	23	67	247
308	1215	4.1	1.5	4.37	0	20	70	250
308	1230	4.4	1.6	4.68	0	20	70	250
308	1245	4.6	1.7	4.90	0	20	70	250
308	1300	5	1.6	5.25	0	18	72	252
308	1315	5.2	1.6	5.44	0	17	73	253
308	1330	5.5	1.8	5.79	0	18	72	252
308	1345	4.9	1.8	5.22	0	20	70	250
308	1400	4.8	1.5	5.03	0	17	73	253
308	1415	4.7	1.6	4.96	0	19	71	251
308	1430	3.7	1.8	4.11	0	26	64	244
308	1445	3.8	1.5	4.09	0	22	68	248
308	1500	4.6	1.7	4.90	0	20	70	250
308	1515	4.3	2	4.74	0	25	65	245
308	1530	4.3	1.8	4.66	0	23	67	247
308	1545	4	2.5	4.72	1	32	58	238
308	1600	4.4	1.8	4.75	0	22	68	248
308	1615	3.2	2.2	3.88	1	35	55	235
308	1630	1.7	2.1	2.70	1	51	39	219
308	1645	2.5	2.2	3.33	1	41	49	229
308	1700	1.9	2.1	2.83	1	48	42	222
308	1715	3.2	1.7	3.62	0	28	62	242
308	1730	4.2	1.4	4.43	0	18	72	252
308	1745	4.7	1.5	4.93	0	18	72	252
308	1800	4.8	1.5	5.03	0	17	73	253
308	1815	4.4	1.2	4.56	0	15	75	255
308	1830	4	1.4	4.24	0	19	71	251
308	1845	4.2	1.1	4.34	0	15	75	255
308	1900	4.6	1.8	4.94	0	21	69	249
308	1915	4.5	1.4	4.71	0	17	73	253
308	1930	3.8	1.5	4.09	0	22	68	248
308	1945	2.8	0.8	2.91	0	16	74	254
308	2000	1.3	1.9	2.30	1	56	34	214
308	2015	2.2	1.3	2.56	1	31	59	239
308	2030	2.7	0.8	2.82	0	17	73	253

JD	TIME	x	y	U	V	Ws	Wd_mag	Wd_deg	Theta	Wd_Corr
308	0	-1.5	-0.7	@SQRT((D5^2)+(E5^2))	@ATAN2(D5,E5)	@DEGREES(G5)	90-H5	+15-180		
308	15	-1.1	0.1	@SQRT((D6^2)+(E6^2))	@ATAN2(D6,E6)	@DEGREES(G6)	90-H6	+16+180		
308	30	-0.6	-0.2	@SQRT((D7^2)+(E7^2))	@ATAN2(D7,E7)	@DEGREES(G7)	90-H7	+17-180		
308	45	0.5	0.3	@SQRT((D8^2)+(E8^2))	@ATAN2(D8,E8)	@DEGREES(G8)	90-H8	+18+180		
308	100	0.3	0.3	@SQRT((D9^2)+(E9^2))	@ATAN2(D9,E9)	@DEGREES(G9)	90-H9	+19+180		
308	115	-0.1	0.4	@SQRT((D10^2)+(E10^2))	@ATAN2(D10,E10)	@DEGREES(G10)	90-H10	+110+180		
308	130	-0.1	0.5	@SQRT((D11^2)+(E11^2))	@ATAN2(D11,E11)	@DEGREES(G11)	90-H11	+111+180		
308	145	0	0.5	@SQRT((D12^2)+(E12^2))	@ATAN2(D12,E12)	@DEGREES(G12)	90-H12	+112+180		
308	200	-0.2	0.4	@SQRT((D13^2)+(E13^2))	@ATAN2(D13,E13)	@DEGREES(G13)	90-H13	+113+180		
308	215	-0.7	-0.1	@SQRT((D14^2)+(E14^2))	@ATAN2(D14,E14)	@DEGREES(G14)	90-H14	+114-180		
308	230	-1.1	-0.3	@SQRT((D15^2)+(E15^2))	@ATAN2(D15,E15)	@DEGREES(G15)	90-H15	+115-180		
308	245	-1.7	-0.3	@SQRT((D16^2)+(E16^2))	@ATAN2(D16,E16)	@DEGREES(G16)	90-H16	+116-180		
308	300	-2.1	-0.3	@SQRT((D17^2)+(E17^2))	@ATAN2(D17,E17)	@DEGREES(G17)	90-H17	+117-180		
308	315	-1.9	-0.6	@SQRT((D18^2)+(E18^2))	@ATAN2(D18,E18)	@DEGREES(G18)	90-H18	+118-180		
308	330	-1.4	-0.7	@SQRT((D19^2)+(E19^2))	@ATAN2(D19,E19)	@DEGREES(G19)	90-H19	+119-180		
308	345	-0.9	-0.5	@SQRT((D20^2)+(E20^2))	@ATAN2(D20,E20)	@DEGREES(G20)	90-H20	+120-180		
308	400	0.4	-0.1	@SQRT((D21^2)+(E21^2))	@ATAN2(D21,E21)	@DEGREES(G21)	90-H21	+121+180		
308	415	0.4	-0.1	@SQRT((D22^2)+(E22^2))	@ATAN2(D22,E22)	@DEGREES(G22)	90-H22	+122+180		
308	430	1	0.2	@SQRT((D23^2)+(E23^2))	@ATAN2(D23,E23)	@DEGREES(G23)	90-H23	+123+180		
308	445	0.7	1.8	@SQRT((D24^2)+(E24^2))	@ATAN2(D24,E24)	@DEGREES(G24)	90-H24	+124+180		
308	500	0.3	1.5	@SQRT((D25^2)+(E25^2))	@ATAN2(D25,E25)	@DEGREES(G25)	90-H25	+125+180		
308	515	0	0.5	@SQRT((D26^2)+(E26^2))	@ATAN2(D26,E26)	@DEGREES(G26)	90-H26	+126+180		
308	530	1.5	1.3	@SQRT((D27^2)+(E27^2))	@ATAN2(D27,E27)	@DEGREES(G27)	90-H27	+127+180		
308	545	0.1	1.8	@SQRT((D28^2)+(E28^2))	@ATAN2(D28,E28)	@DEGREES(G28)	90-H28	+128+180		
308	600	-0.5	0.3	@SQRT((D29^2)+(E29^2))	@ATAN2(D29,E29)	@DEGREES(G29)	90-H29	+129+180		
308	615	-0.6	0	@SQRT((D30^2)+(E30^2))	@ATAN2(D30,E30)	@DEGREES(G30)	90-H30	+130+180		
308	630	-0.6	-0.1	@SQRT((D31^2)+(E31^2))	@ATAN2(D31,E31)	@DEGREES(G31)	90-H31	+131-180		

**CHILE METEOROLOGICAL DATA**

Year: 1989

Site: SUMMIT

Period: 308-311

Average and maximum/minimum of the meteorological parameters for  
November 4 - 7, 1989 :  
 (5 minute average data)

Parameter	W <sub>s</sub> #1 (m s <sup>-1</sup> )	W <sub>s</sub> #2 (m s <sup>-1</sup> )	W <sub>d</sub> (°)	T (°C)	RH (%)	P (mb)	Peak W <sub>s</sub> #1	Gust W <sub>s</sub> #2
Average	2.71	1.90	243	10.1	92.7	925	3.62	2.50
Maximum	7.04	5.55	346	14.1	98.7	928	9.07	7.47
Minimum	0.45	0.45	24	8.5	81.6	920		

W<sub>s</sub>#1 = Tower; W<sub>s</sub>#2 = Mesh (Peak Gust in m s<sup>-1</sup>)

Average and maximum/minimum of the meteorological parameters for  
November 4 - 7, 1989 when wind direction was 270° ± 20°:  
 (5 minute average data)

Parameter	W <sub>s</sub> #1 (m s <sup>-1</sup> )	W <sub>s</sub> #2 (m s <sup>-1</sup> )	W <sub>d</sub> (°)	T (°C)	RH (%)	P (mb)	Peak W <sub>s</sub> #1	Gust W <sub>s</sub> #2
Average	3.35	2.33	275	10.2	92.9	925	4.44	3.06
Maximum	7.04	5.54	290	14.1	98.7	928	9.07	7.47
Minimum	0.45	0.45	250	8.5	81.6	920		

W<sub>s</sub>#1 = Tower; W<sub>s</sub>#2 = Mesh (Peak Gust in m s<sup>-1</sup>)

**CHILE METEOROLOGICAL DATA**

Year: 1989

Site: SUMMIT

Period: 308-311

Hourly average and hourly maximum/minimum of the meteorological parameters for  
November 4 - 7, 1989 :

(from 5 minute avg data)

Parameter	W <sub>s</sub> #1 (m s <sup>-1</sup> )	W <sub>s</sub> #2 (m s <sup>-1</sup> )	W <sub>d</sub> (°)	T (°C)	RH (%)	p (mb)	R (W m <sup>-2</sup> )	Peak W <sub>s</sub> #1	Gust W <sub>s</sub> #2
Average	2.71	1.93	243	10.1	92.7	925	167	3.63	2.53
Maximum	6.29	4.50	289	13.1	98.6	928	1006	7.88	5.79
Minimum	0.49	0.45	53	8.6	83.7	920	-2		

W<sub>s</sub>#1 = Tower; W<sub>s</sub>#2 = Mesh (Peak Gust in m s<sup>-1</sup>)

Hourly average and hourly maximum/minimum of the meteorological parameters for  
November 4 - 7, 1989 when wind direction was 270° ± 20° :

(from 5 minute avg data)

Parameter	W <sub>s</sub> #1 (m s <sup>-1</sup> )	W <sub>s</sub> #2 (m s <sup>-1</sup> )	W <sub>d</sub> (°)	T (°C)	RH (%)	p (mb)	R (W m <sup>-2</sup> )	Peak W <sub>s</sub> #1	Gust W <sub>s</sub> #2
Average	3.23	2.31	275	10.2	92.9	925	209	4.30	3.02
Maximum	6.29	4.50	289	13.1	98.6	928	1006	7.88	5.79
Minimum	0.62	0.48	260	8.7	83.7	920	-2		

W<sub>s</sub>#1 = Tower; W<sub>s</sub>#2 = Mesh (Peak Gust in m s<sup>-1</sup>)

**FILE: ES9HRWS.WQ1**  
**Chile 1989 - Summit**  
 Hourly Ws data  
 Period: November 4 - 7

<u>Wind Speed - Tower</u>	308	309	310	311
<u>JD/TIME</u>	308	309	310	311
100		1.27	0.95	1.23
200		0.83	0.88	0.57
300		1.74	0.93	0.68
400		1.28	0.68	1.52
500		2.65	0.49	0.49
600		3.10	0.61	1.09
700		1.55	0.63	0.62
800		0.70	1.00	1.19
900		0.69	0.69	2.17
1000		2.47	1.86	2.33
1100		3.73	3.21	1.98
1200		4.32	4.37	2.44
1300		5.00	5.22	2.86
1400	4.49	3.71	4.77	
1500	5.74	3.03	5.07	
1600	4.40	5.89	5.32	
1700	4.08	5.50	6.29	
1800	2.21	5.72	5.88	
1900	4.06	5.03	5.47	
2000	4.71	3.65	4.65	
2100	3.40	2.03	3.65	
2200	2.59	1.71	2.68	
2300	2.35	1.90	1.97	
0	0.67	1.12	1.43	
Daily				
Average:	3.52	2.86	2.86	1.48

**Summit - 1989**  
 Average: 2.71  
 Maximum: 6.29  
 Minimum: 0.49  
 Std.Dev: 1.75

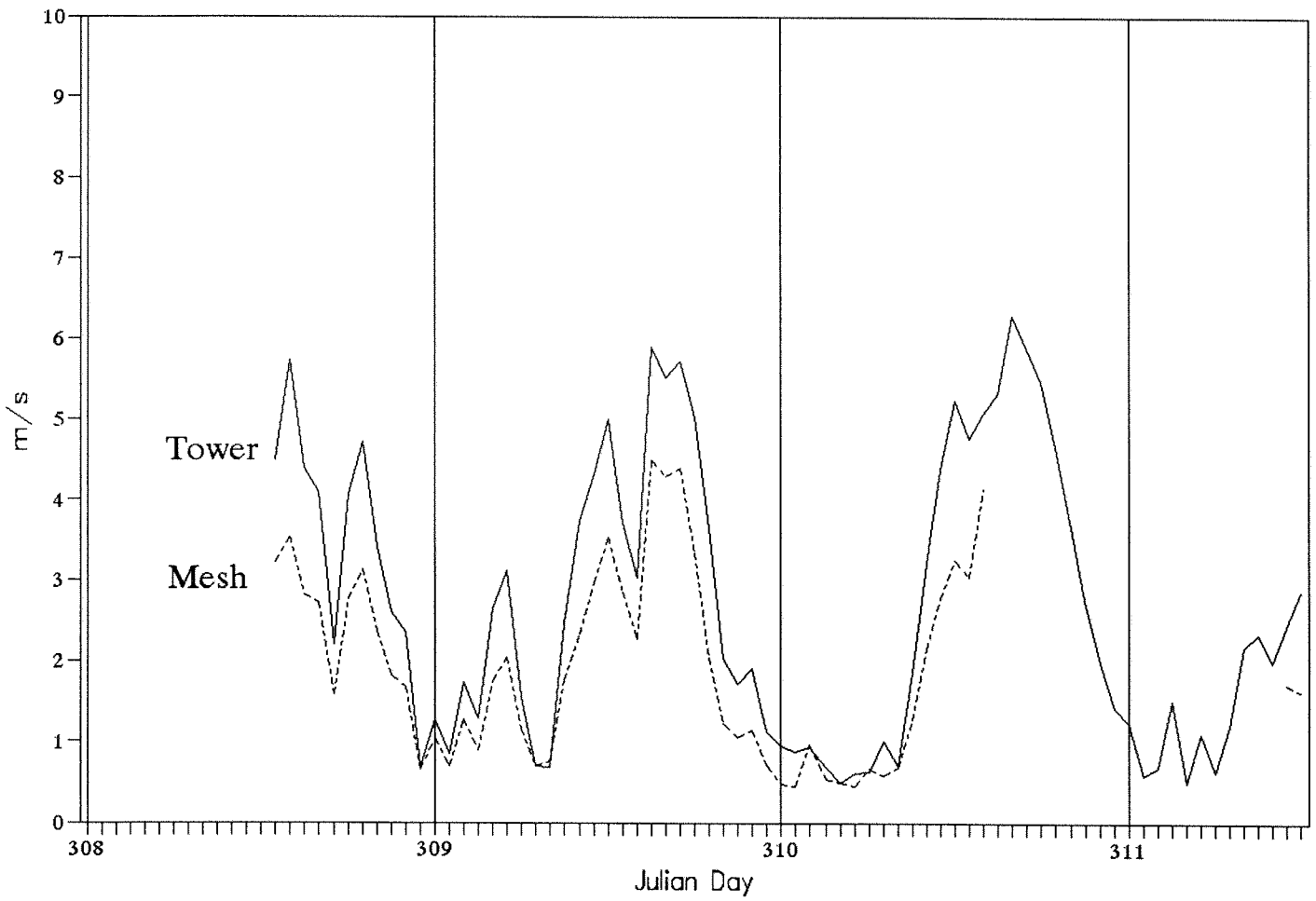
<u>Wind Speed - Mesh</u>	308	309	310	311
<u>JD/TIME</u>	308	309	310	311
100		1.04	0.48	
200		0.70	0.45	
300		1.27	0.96	
400		0.90	0.53	
500		1.75	0.49	
600		2.04	0.45	
700		1.15	0.66	
800		0.70	0.57	
900		0.75	0.68	
1000		1.77	1.27	
1100		2.33	2.15	
1200		2.97	2.77	1.71
1300		3.55	3.26	1.63
1400	3.22	2.85	3.04	
1500	3.54	2.27	4.13	
1600	2.83	4.50		
1700	2.72	4.28		
1800	1.58	4.38		
1900	2.76	3.33		
2000	3.13	2.05		
2100	2.37	1.22		
2200	1.82	1.06		
2300	1.67	1.14		
0	0.64	0.72		
Daily				
Average:	2.39	2.03	1.46	1.67

**Summit - 1989**  
 Average: 1.93  
 Maximum: 4.50  
 Minimum: 0.45  
 Std.Dev: 1.17

Maximum Daily Average: 2.39  
 Minimum Daily Average: 1.46

# Wind Speed

Chile 1989 - Summit



**CHILE 1989 METEOROLOGICAL DATA**Site: SUMMIT - WS#1 (Tower)Period: November 4 - 7, 1989 (JD:308-311)Frequency distribution for hourly wind speed ( $\text{m s}^{-1}$ )

BINS	RANGES	FREQUENCY	% of TOTAL
1	0 - 1.00	17	23.61
2	1.01 - 2.00	15	20.83
3	2.01 - 3.00	11	15.28
4	3.01 - 4.00	8	11.11
5	4.01 - 5.00	10	13.89
6	5.01 - 6.00	10	13.89
7	6.01 - 7.00	1	1.39
8	7.01 - 8.00	0	0
Total =		72	100

Cummulative frequency distribution for hourly wind speed

Wind speed ( $\text{m s}^{-1}$ )	Cummulative frequency	Cummulative % of Total
Less than 1.01	17	23.61
Less than 2.01	32	44.44
Less than 3.01	43	59.72
Less than 4.01	51	70.83
Less than 5.01	61	84.72
Less than 6.01	71	98.61
Less than 7.01	72	100.00
Less than 8.01	72	100.00

**CHILE 1989 METEOROLOGICAL DATA**Site: SUMMIT - WS#2 (Mesh)Period: November 4 - 7, 1989 (JD:308-311)Frequency distribution for hourly wind speed ( $m\ s^{-1}$ )

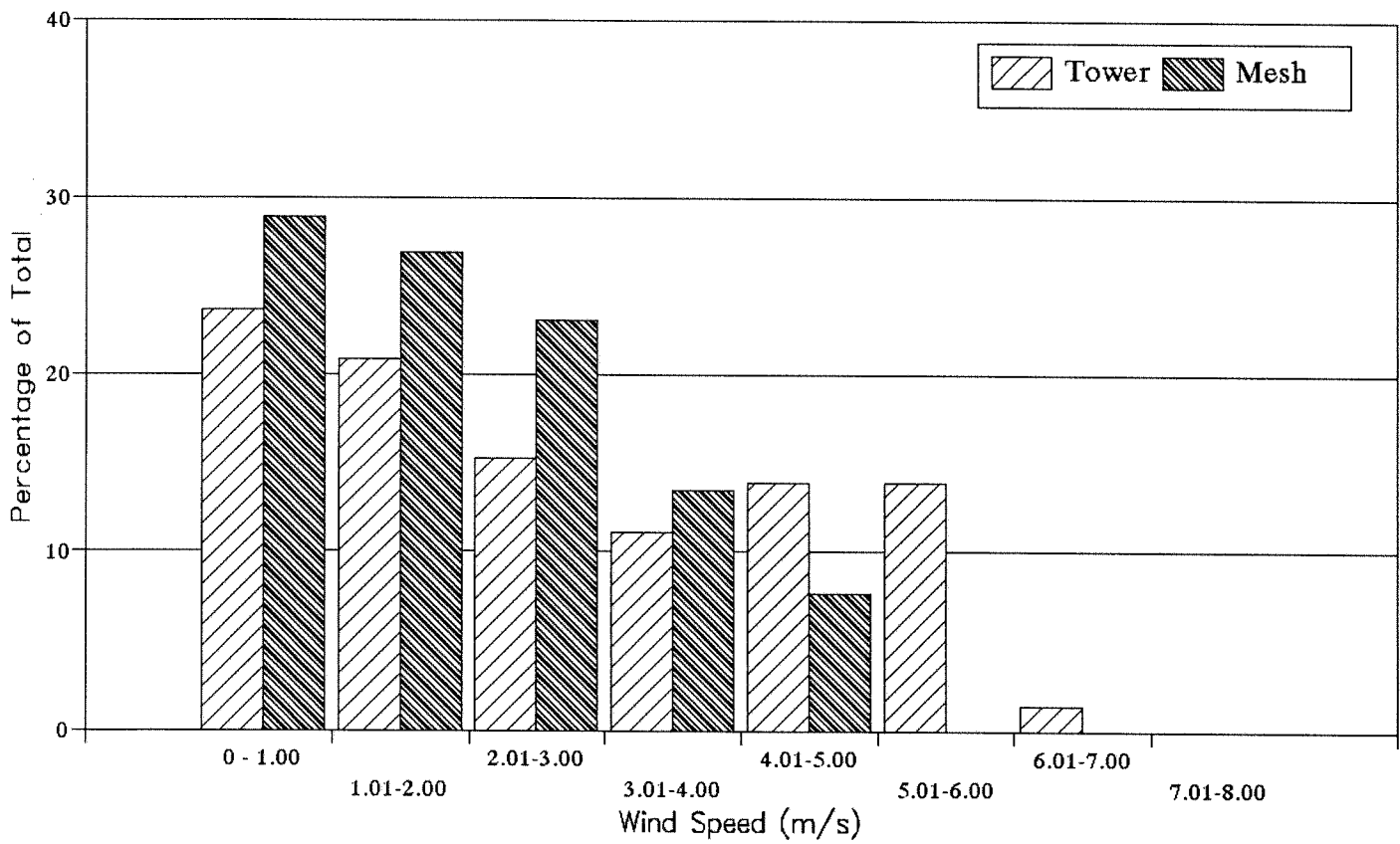
BINS	RANGES	FREQUENCY	% of TOTAL
1	0 - 1.00	15	28.85
2	1.01 - 2.00	14	26.92
3	2.01 - 3.00	12	23.08
4	3.01 - 4.00	7	13.46
5	4.01 - 5.00	4	7.69
6	5.01 - 6.00	0	0
7	6.01 - 7.00	0	0
8	7.01 - 8.00	0	0
Total=		52	100

Cummulative frequency distribution for hourly wind speed

Wind speed ( $m\ s^{-1}$ )	Cummulative frequency	Cummulative % of Total
Less than 1.01	15	28.85
Less than 2.01	29	55.77
Less than 3.01	41	78.85
Less than 4.01	48	92.31
Less than 5.01	52	100.00
Less than 6.01	52	100.00
Less than 7.01	52	100.00
Less than 8.01	52	100.00

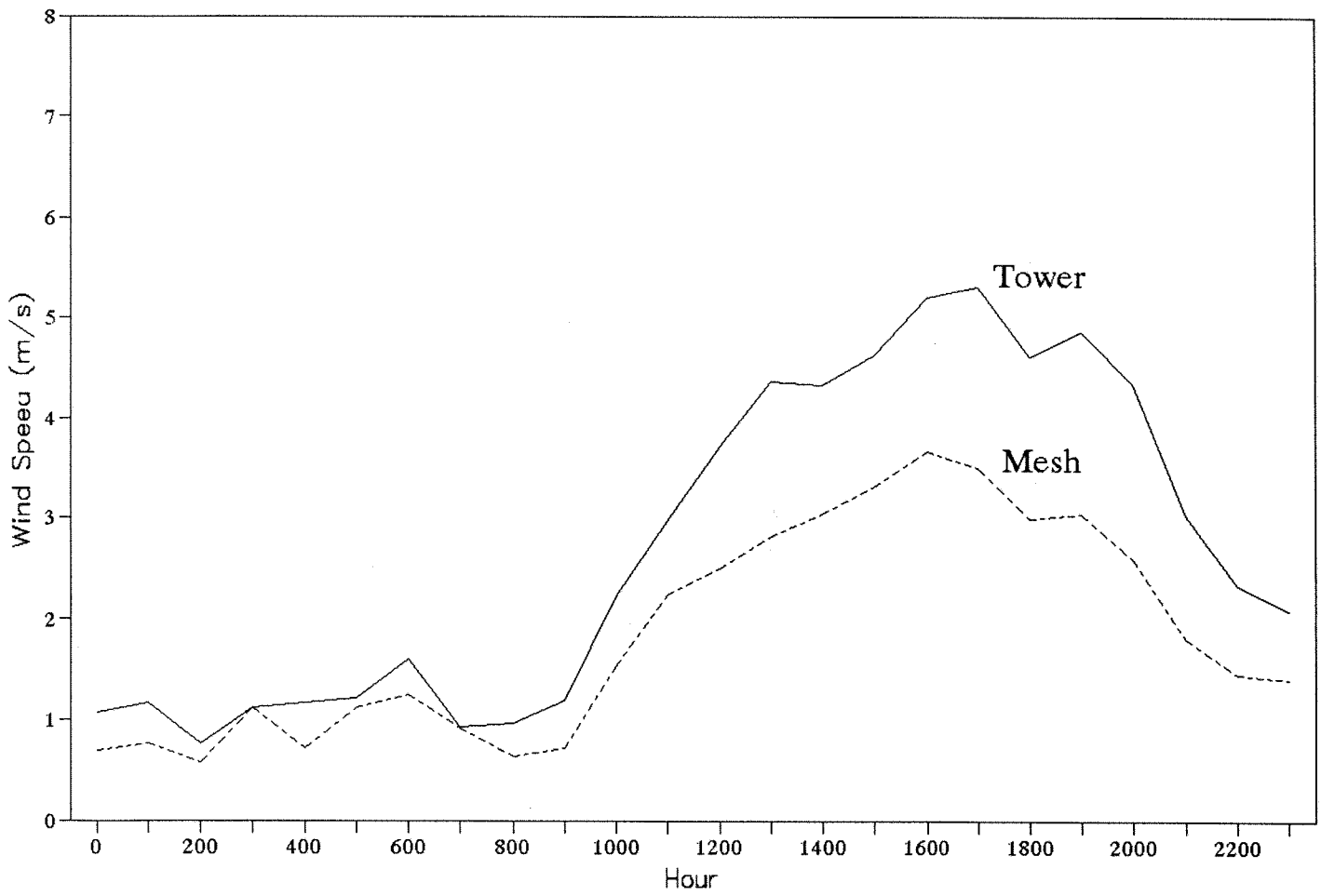
# Frequency Distribution of Wind Speed

Chile 1989 - Summit



# Diurnal Cycle of Wind Speed

Chile 1989 - Summit



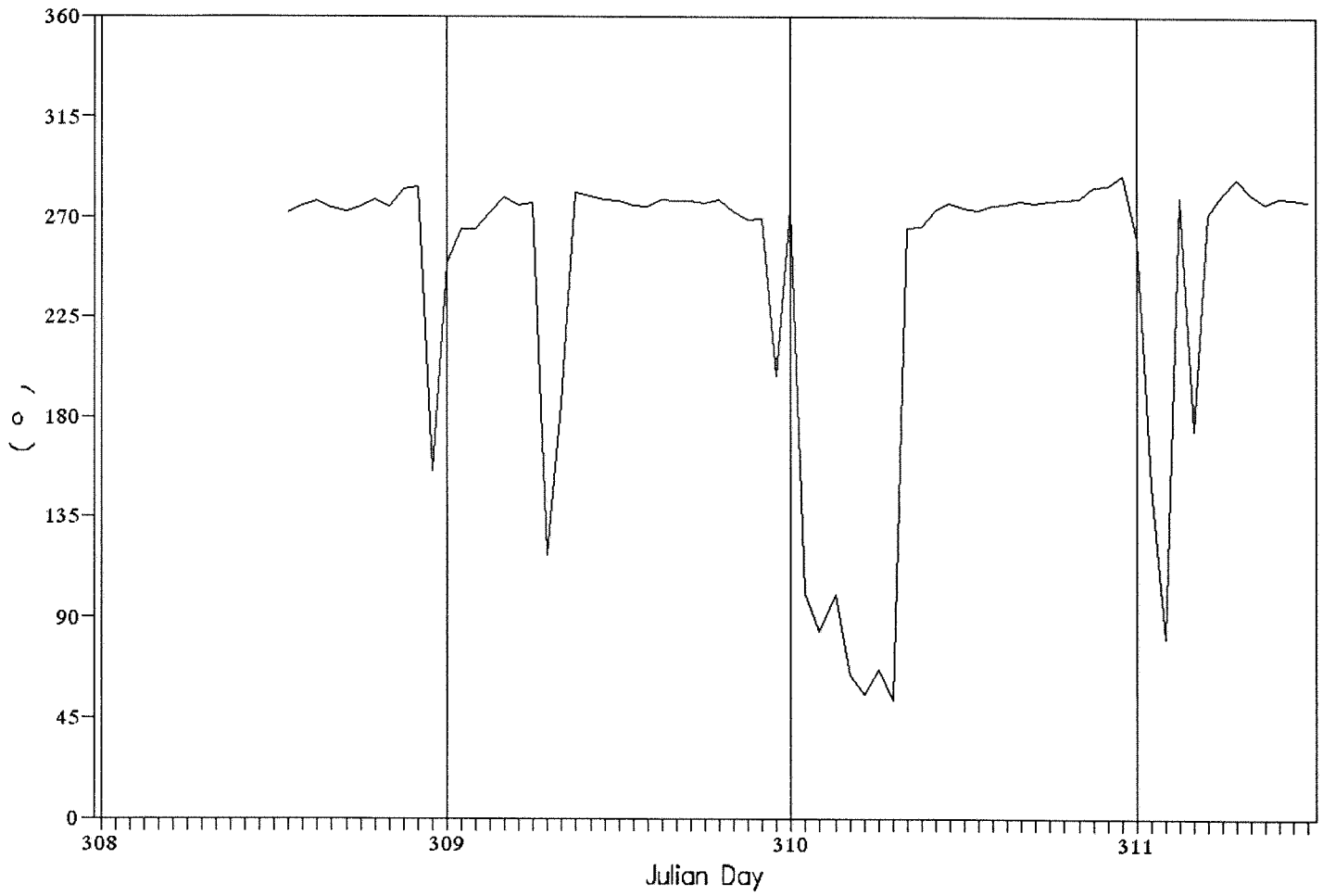
File: ES9HRWD.WQ1  
 Chile 1989 - Summit  
 Hourly Wd data  
 Period: November 4 - 7

<u>Wind Direction</u> TIME/JD	308	309	310	311
100	249	274	260	
200	264	101	150	
300	264	83	80	
400	271	100	278	
500	279	64	174	
600	275	55	271	
700	276	67	280	
800	118	53	287	
900	186	265	280	
1000	281	265	276	
1100	279	273	279	
1200	277	276	278	
1300	277	274	277	
1400	275	273		
1500	274	275		
1600	277	275		
1700	273	277		
1800	272	276		
1900	274	277		
2000	278	278		
2100	274	278		
2200	283	283		
2300	283	284		
0	155	289		
Daily Average:	265	217	244	

**Summit - 1989**  
 Average: 243      Maximum Daily Average: 265  
 Maximum: 289      Minimum Daily Average: 217  
 Minimum: 53  
 Std.Dev: 68

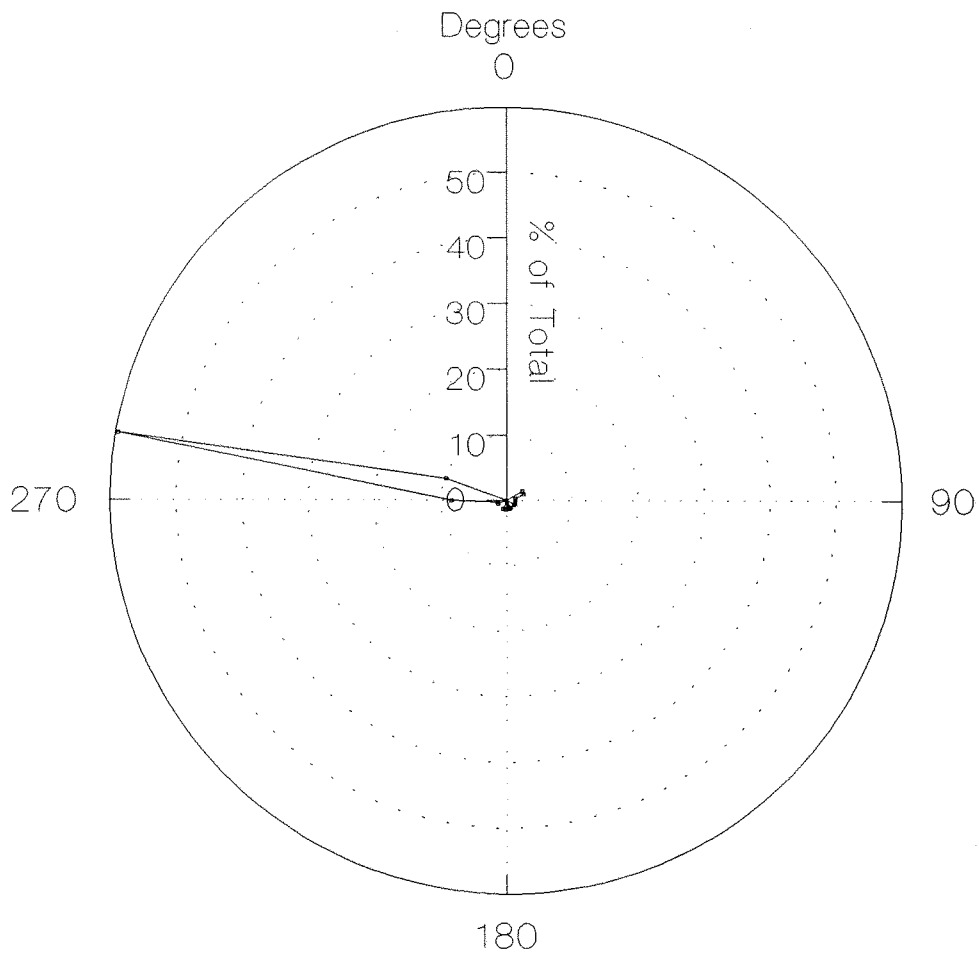
# Wind Direction

Chile 1989 - Summit



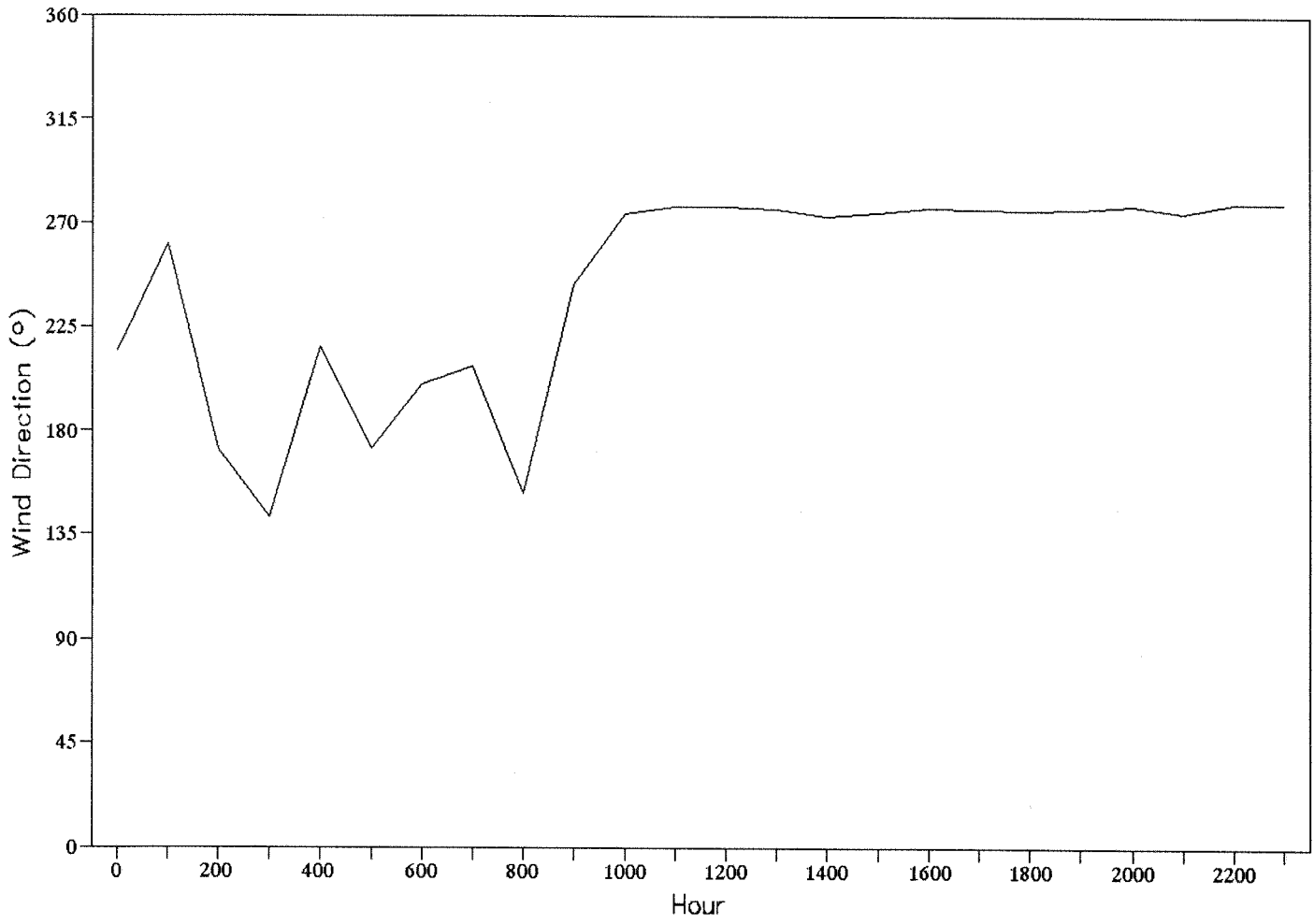
Wind Direction Frequency Distribution  
 CHILE SUMMIT 1989

Degrees	Counts	% of total	Direction	Degrees	Counts	% of total
10	0	0.00	NE	45	0	0.00
20	0	0.00	E	90	6	8.33
40	0	0.00	SE	135	3	4.17
50	0	0.00	S	180	3	4.17
60	2	2.78	SW	225	2	2.78
70	2	2.78	W	270	8	11.11
80	1	1.39	NW	315	50	69.44
90	1	1.39	N	360	0	0.00
100	1	1.39			0	
110	1	1.39				
120	1	1.39		Sum:	72	100
130	0	0.00				
140	0	0.00				
150	1	1.39				
160	1	1.39				
170	0	0.00				
180	1	1.39				
190	1	1.39				
200	1	1.39				
210	0	0.00				
220	0	0.00				
230	0	0.00				
240	0	0.00				
250	1	1.39				
260	1	1.39				
270	6	8.33				
280	43	59.72				
290	7	9.72				
310	0	0.00				
320	0	0.00				
330	0	0.00				
340	0	0.00				
350	0	0.00				
360	0	0.00				
	0					
Sum:	72	100				



Chile 1989 - Summit, Frequency distribution for wind direction (Systat filename: ES9WD1.SYS)

### Diurnal Variation of Wind Direction Chile 1989 - Summit

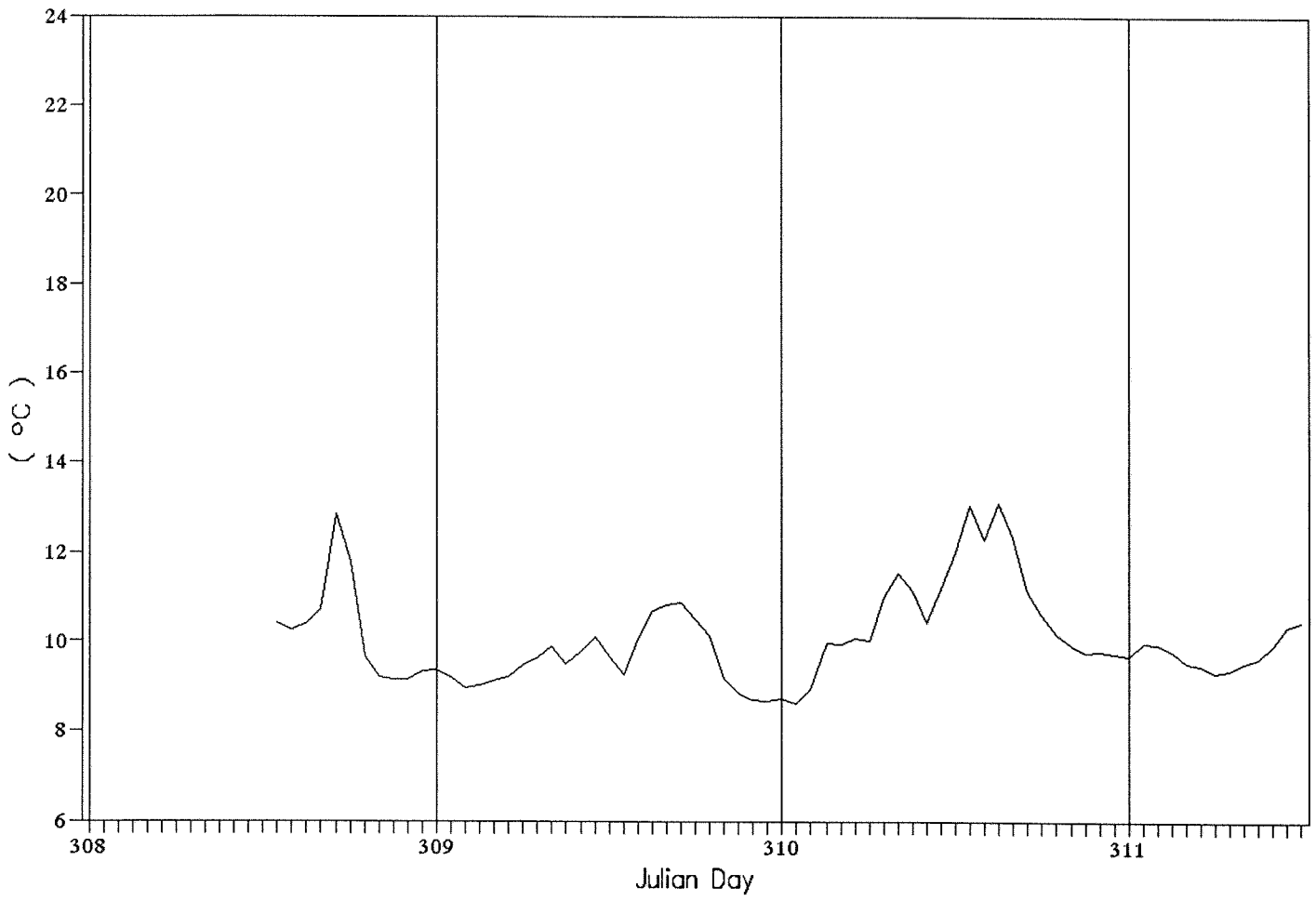


File: ES9HRMP.WQ1  
 Chile 1989 - Summit  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Temperature</u> TIME/JD	308	309	310	311
100	9.4	8.7	9.7	
200	9.2	8.6	10.0	
300	9.0	8.9	9.9	
400	9.0	10.0	9.8	
500	9.1	9.9	9.5	
600	9.2	10.1	9.5	
700	9.5	10.0	9.3	
800	9.6	11.0	9.4	
900	9.9	11.5	9.5	
1000	9.5	11.1	9.6	
1100	9.8	10.4	9.9	
1200	10.1	11.2	10.3	
1300	9.7	12.0	10.5	
1400	9.2	13.0		
1500	10.1	12.3		
1600	10.4	13.1		
1700	10.7	12.3		
1800	12.8	11.1		
1900	11.8	10.6		
2000	9.7	10.2		
2100	9.2	9.9		
2200	9.2	9.7		
2300	9.1	9.8		
0	9.3	9.7		
Daily Average:	10.3	9.6	10.6	9.8

**Summit - 1989**  
 Average: 10.1      Maximum Daily Average: 10.6  
 Maximum: 13.1      Minimum Daily Average: 9.6  
 Minimum: 8.6  
 Std.Dev: 1.0

# Temperature Chile 1989 - Summit



File: ES9HRMP.WQ1  
 Chile 1989 - Summit  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

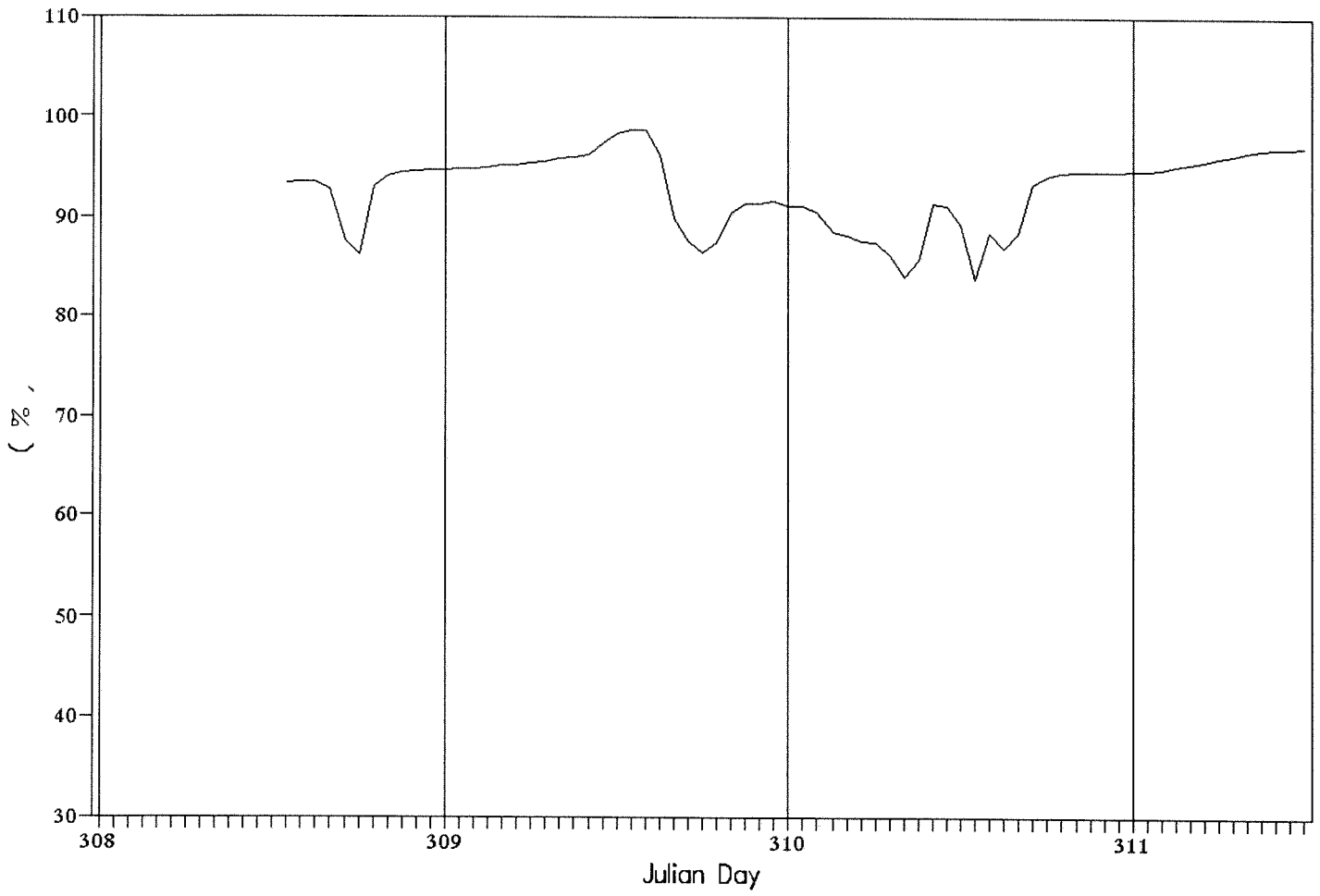
<u>Relative Humidity</u>	
<u>TIME/JD</u>	<u>308</u>
100	309
200	310
300	311
400	
500	
600	
700	
800	
900	
1000	
1100	
1200	
1300	
1400	
1500	
1600	
1700	
1800	
1900	
2000	
2100	
2200	
2300	
0	
Daily	
Average:	

**Summit - 1989**  
 Average: 92.7  
 Maximum: 98.6  
 Minimum: 83.7  
 Std.Dev: 3.7

Maximum Daily Average: 95.8  
 Minimum Daily Average: 89.9

# Relative Humidity

## Chile 1989 - Summit

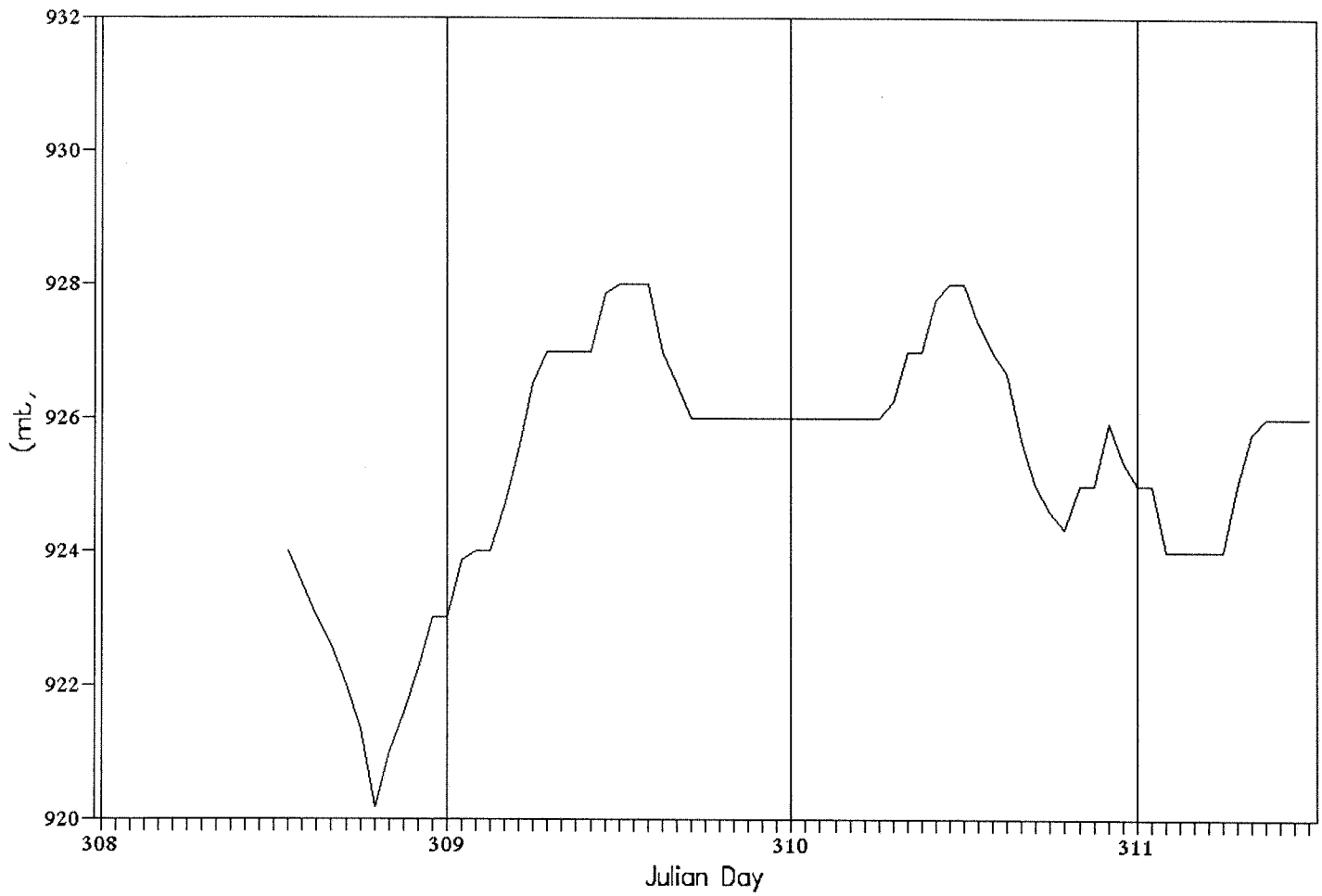


File: ES9HRMP.WQ1  
 Chile 1989 - Summit  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Pressure</u>	<u>TIME/JD</u>	308	309	310	311
100			923	926	925
200			924	926	925
300			924	926	924
400			924	926	924
500			925	926	924
600			926	926	924
700			927	926	924
800			927	926	925
900			927	927	926
1000			927	927	926
1100			927	928	926
1200			928	928	926
1300			928	928	926
1400		924	928	927	
1500		924	928	927	
1600		923	927	927	
1700		923	927	926	
1800		922	926	925	
1900		921	926	925	
2000		920	926	924	
2100		921	926	925	
2200		922	926	925	
2300		922	926	926	
0		923	926	925	
Daily					
Average:		922	926	926	925

**Summit - 1989**  
 Average: 925      Maximum Daily Average: 926  
 Maximum: 928      Minimum Daily Average: 922  
 Minimum: 920  
 Std.Dev: 2

# Pressure Chile 1989 - Summit



File: ES9HIRMP.WQ1  
 Chile 1989 - Summit  
 Hourly T/RH/R/p data  
 Period: November 4 - 7

<u>Solar Radiation</u>		308	309	310	311
<u>TIME/JD</u>					
100		1	-2	-1	
200		1	-2	-1	
300		0	-2	-1	
400		0	-2	-1	
500		0	-2	-1	
600		-0	-2	-0	
700		0	-0	0	
800		9	46	13	
900		71	97	59	
1000		96	114	109	
1100		159	715	155	
1200		215	827	286	
1300		175	1006	264	
1400	521	248	927		
1500	439	456	749		
1600	476	515	762		
1700	409	335	423		
1800	531	208	183		
1900	214	94	67		
2000	23	35	14		
2100	2	-0	0		
2200	1	-1	-1		
2300	1	-1	-1		
0	1	-1	-1		
Daily					
Average:	238	109	247	68	

*Daily maximum hourly solar radiation*  
 Average: 585  
 Maximum: 1006  
 Minimum: 286  
 Min/Max: 0.28

247 68

Maximum Daily Average: 247  
 Minimum Daily Average: 68  
 167 1006  
 -2  
 254

**Summit - 1989**  
 Average: 167  
 Maximum: 1006  
 Minimum: -2  
 Std.Dev: 254  
 Daily  
 Maximum: 531  
 515 1006 286

# Solar Radiation Chile 1989 - Summit

