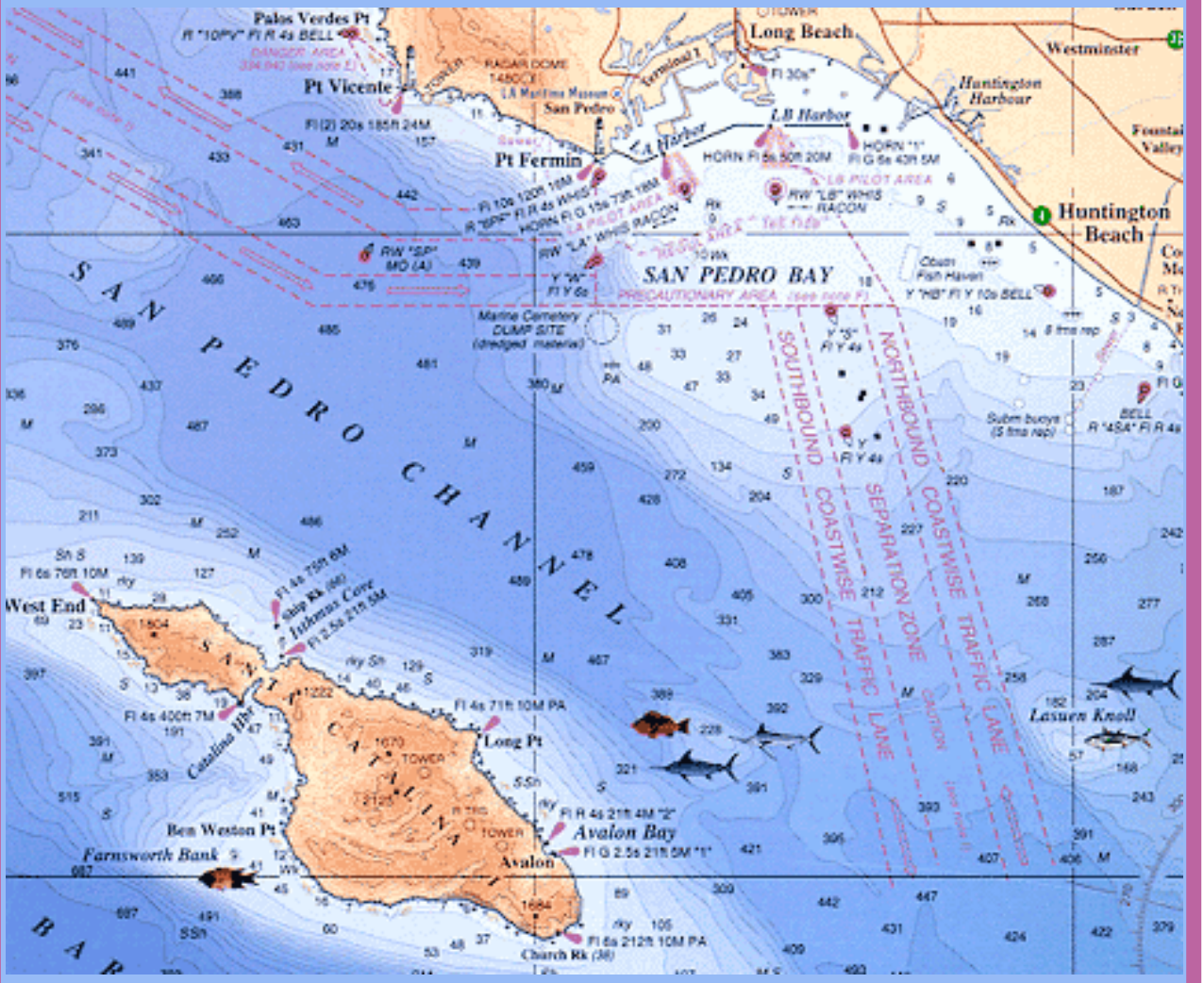
ADCP Moorings in the San Pedro Channel

FINAL REPORT



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Introduction

The Los Angeles District was tasked with collecting current data at two offshore dumpsites in the vicinity of San Pedro Channel. Starting in June 2000, a series of moorings were deployed at two sites, LA-2 and LA-3 (Figure 1). In addition, a series of five conductivity-temperature-depth (CTD) casts were done at and around each site (Table 1). The CTD data are used to determine temperature and salinity at each site and determine how representative the mooring sites were of the surrounding water. The mooring sites were at the edge of the dump areas to avoid damage from dumping at the sites.

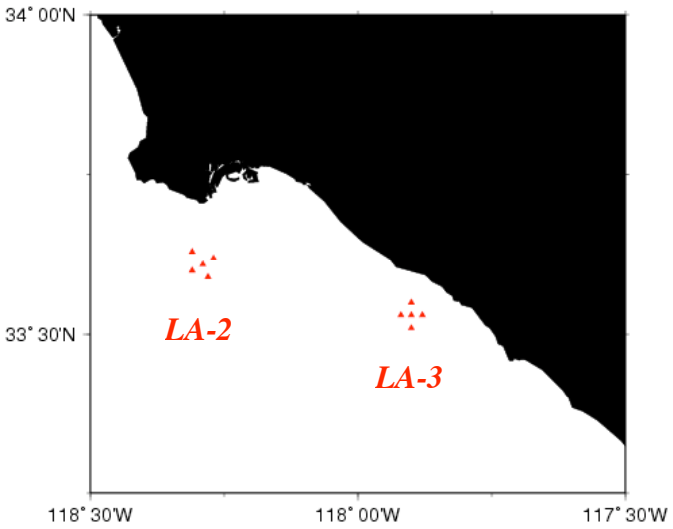


Figure 1. The locations of the ten CTD stations that were occupied during 2000-2002. The center triangle in each set of five is the location of the mooring.

Data Collection and Methods

Data were collected in collaboration with the U.S. Army Corps of Engineers at Ocean Disposal Sites LA-2 and LA-3 off the coast of Southern California in the vicinity of the San Pedro Channel. The Army Corps of Engineers was interested in fate and transport of discharged materials at the two dump sites, and they plan to use water-current data in modeling circulation in the area as an element of a larger environmental assessment. Site LA-2 is located at approximately 33°37.1'N, 118°17.4'W. Site LA-3 is located at approximately 33º31.7'N, 119º54.8'W. The period of data collection ran from June 15, 2000 through November 28, 2001, with an additional set of CTD profiles collected in February 2002.

Each mooring contained two floats, an upward looking 75 kHz ADCP and a current meter that also measured water temperature. The 75 kHz ADCP can measure currents through ~500m of the water column. Below the ADCP, a single-point current meter (RCM-9) was deployed to measure hourly near-bottom currents. The plan was to start deploying the moorings in June 2000. The moorings would then be turned around at regular intervals, with final recovery in November 2001. The ADCPs were to be recovered and turned around at sea for immediate redeployment.,

Moorings were initially deployed on June 15, 2000 (00LA-2A, 00LA3A). Five successive moorings were deployed at Site 2, with the final mooring (00LA-2E) being removed from the water in November of 2001. Four moorings were successfully deployed at Site 3. On August 24, 2000, the mooring failed to surface after being released. The release appeared to remain stationary, and so on September 8, a remotely operated vehicle (ROV) was used to recover the mooring. The lower of the two floats had imploded upon deployment. The second float kept the ADCP upright, and so we obtained good data from it. The current meter, however, was in the mud and no current data were obtained from it. The ADCP was slightly damaged from the implosion of the 28-inch steel float and required repair from the factory. After repair, it was redeployed in November. The recovery and deployment operations continued without problems from then on.

CTD casts were taken with Seabird SBE-19, SBE-9, and SBE-911 Plus systems. Salinity calibration samples were taken. All data were processed following standard oceanographic procedures. Appendix 1 contains plots of all the CTD data. Appendix 2 shows time series of currents as measured from the ADCPs, and Appendix 3 shows time series from the RCM-9s. Appendix 4 contains cruise reports for the major cruises.

Table 1: Data-collection time line. The dates of the observations and the names of the oceanographic ships used are given below. The locations of the CTDs are shown in Figure 1. Cruise reports for some of the cruises are provided in the appendix at the back of this report.

	Site 2	**Site 3**	**Cruise (Ship)**
June 15, 2000	Deploy 2A	Deploy 3A	LA00-01 (Seawatch)
July 21, 2000	5 CTD casts	5 CTD casts	AR00-06 (McArthur)
August 24, 2000	Recover 2A Deploy 2B	Attempt recovery 3A Float failure	LA00-02 (Yellowfin)
September 8, 2000		Recover 3A – ROV	LA00-03 (Christopher G.)
November 15, 2000	Recover 2B Deploy 2C	Deploy 3C	LA00-04 (Yellowfin)
January 17, 2001	Recover 2C Deploy 2D	Recover 3C Deploy 3D	LA01-01 (Seawatch)
May 10, 2001	5 CTD casts	5 CTD casts	KA01-04
June 13, 2001	Recover 2D Deploy 2E	Recover 3D Deploy 3E	LA01-02 (Seawatch)
November 28, 2001	Recover 2E 5 CTD casts	Recover 3E 5 CTD casts	LA01-03 (Yellowfin)
February 28, 2002	5 CTD casts	5 CTD casts	DS02-01

Results

Temperature and Salinity

The profiles of temperature and salinity were as expected: Relatively warm water was observed above 50m on each cast, and the temperature tended to decrease linearly with depth below 100m. On some of the casts, there was significant small-scale (~5m) variability below 100m in the salinity records that is suspect. Plots of data from each of the casts can be seen in Appendix 1.

Shown in Figure 2 are the temperature and salinity measured at Site 2 during the four CTD surveys. The greatest variability is in the upper 50m where the strong seasonal signal is evident. The warmest temperatures were observed in July. Cooling and deepening of the mixed layer occurred by November, with the coldest temperatures measured in February. At Site 2, the temperatures at depth were relatively stable with variability at 200m of less that 1°C. Salinity was less reliable, but the envelope of variability was < 0.1 psu. The deeper site (3) shows greater variability in both temperature and salinity in the bottom 150m (280m-430m), which is

surprising, indicating that there may be intrusions of deeper slope water in this location (Figure 3).

The complexities in water properties in the bottom 100m result from both intrusions of more saline outer slope water onto the shelf and slope, and meanders of the coastal current. The higher salinity near the surface in July may be the signature of upwelled water moving offshore. In February there appears to be an intrusion of warmer, more saline water between 100 and 150m.

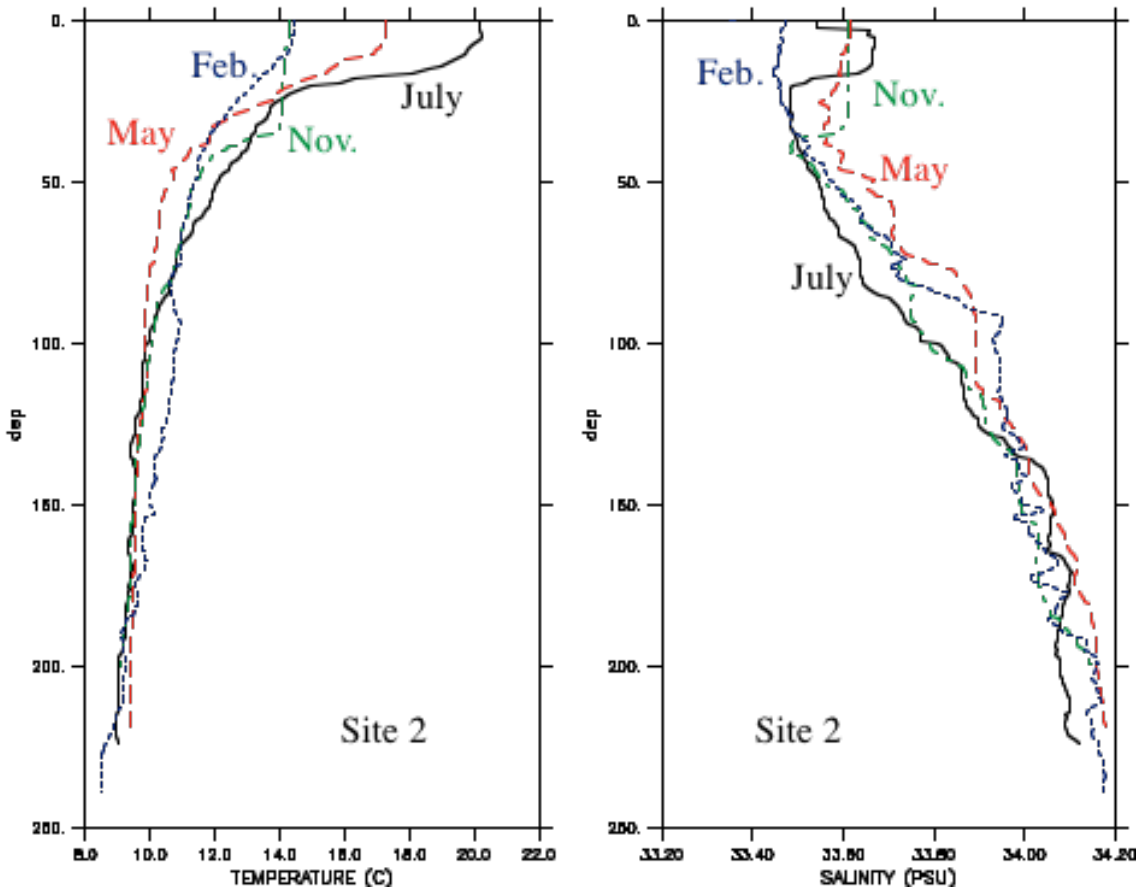


Figure 2. Temperature and salinity measured at Site 2. The salinity profiles have been smoothed from those shown in Appendix 1. The month during which measurements were made is indicated in color.

Currents

Currents were measured using both RCM-9s and 75 kHz ADCPs. We will focus on the results from the ADCPs. Shown in Appendix 2 are all the data measured using the ADCPs. These data are low-pass filtered to remove the tidal velocities. In Appendix 3 are the data from the RCM-9s, showing both the hourly data and the low-pass filtered data. We will first discuss the tidal velocities and then the low-pass filtered data.

Tides

A tidal analysis of the hourly current records during June through November 2001 show that the dominant tidal components are M2 and K1. As expected, tidal currents are stronger at the shallow site (2) than at the deeper site. At both sites, the vertical variability in the tidal signal is stronger than the temporal variability at a single depth. At Site 2, the tidal currents are slightly stronger at the surface than at depth (Table 2), while at Site 3 (Table 3) the vertical variability is less pronounced. In the upper 100m at Site 2, the tidal velocities, especially the K1 components, are largely rotary, while in the bottom 50-100m the tidal velocities are rectified with major axis parallel to ~160°T. There is less variability in the tidal amplitude at Site 3, but direction is highly variable. This variability is likely a result of the weak tidal signal that results in large fluctuations in direction. There appears to be a small, but consistent increase in the amplitude of the M2 tidal velocities at depth at both sites.

The contribution of tides to the velocity can be seen in Appendix 3. The first plot for each time period is the low-pass filtered data which clearly shows events on the time scale of 1-3 days. On the following page is the hourly data. The low-frequency signal is clearly evident above the noise of the tidal currents.

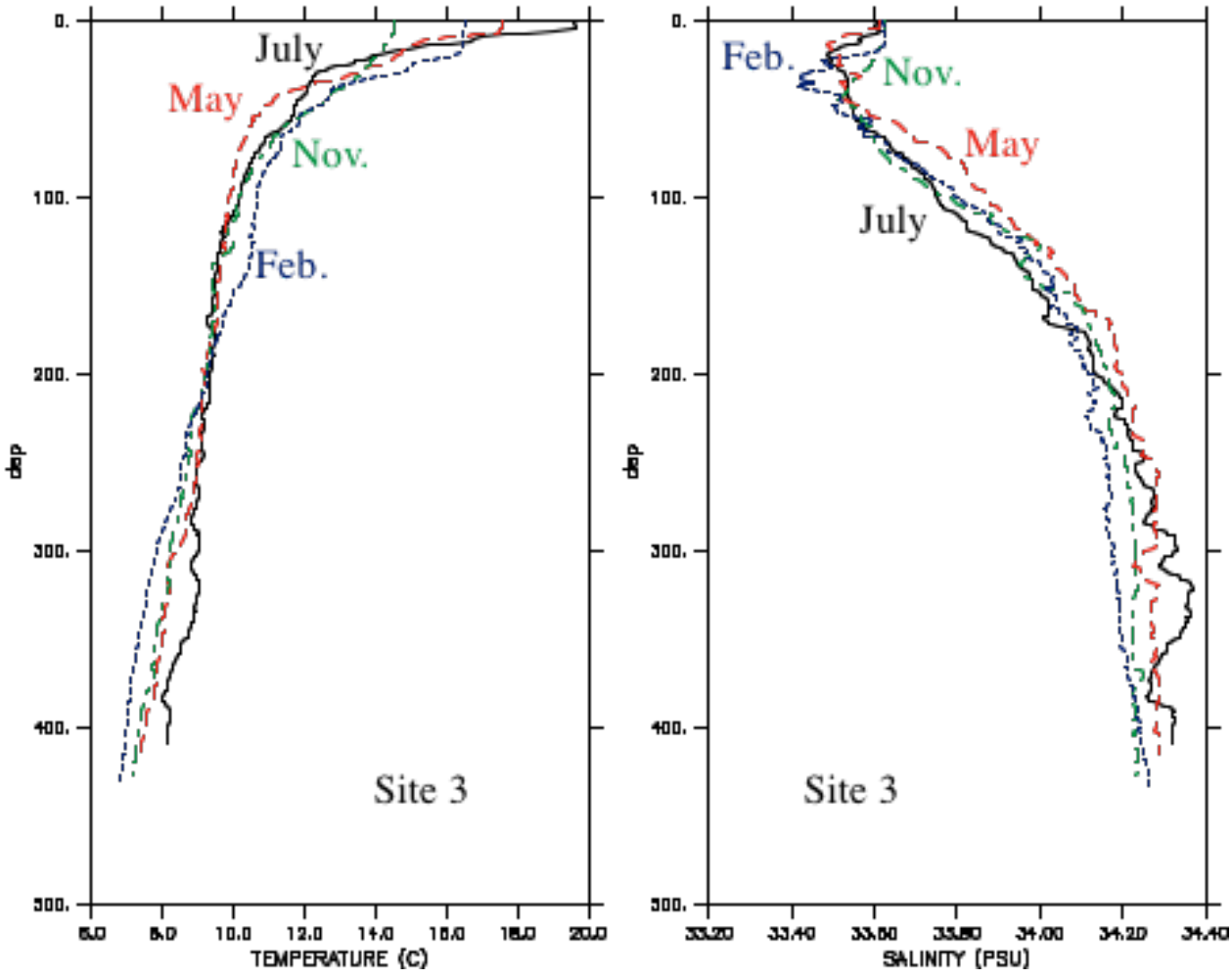


Figure 3. Temperature and salinity measured at Site 3. The month during which measurements were made is indicated.

Table 2. Selected components of tidal amplitude at Site 2 for the period June through November 2001.

Depth (m)	Amplitude of major axis (M2) (cm s^{-1})	Amplitude of minor axis (M2) (cm s^{-1})	Amplitude of major axis (K1) (cm s^{-1})	Amplitude of minor axis (K1) (cm s^{-1})
22	5.7	1.1	6.9	5.0
52	4.8	1.9	3.1	1.1
82	3.5	1.4	4.4	0.4
112	3.2	1.0	5.7	0.3
142	2.0	0.7	5.4	0.3
172	1.9	0.5	4.0	0.2
202	2.1	0.3	3.1	0.3
222	2.2	0.3	2.3	0.1

Table 3. Selected components of tidal amplitude at Site 3 for the period June through November 2001.

Depth (m)	Amplitude of major axis (M2) (cm s^{-1})	Amplitude of minor axis (M2) (cm s^{-1})	Amplitude of major axis (K1) (cm s^{-1})	Amplitude of minor axis (K1) (cm s^{-1})
47	2.1	0.3	3.8	0.7
79	1.62	0.5	1.4	0.3
111	1.9	0.4	1.0	0.2
143	1.7	0.4	0.8	0.2
175	1.5	0.3	0.9	0.2
207	1.5	0.3	0.9	0.1
239	1.4	0.3	0.8	0.2
271	1.3	0.4	0.7	0.1
303	1.1	0.4	0.8	0.3
335	1.3	0.4	0.6	0.2
367	1.3	0.6	0.5	0.1
383	1.4	0.5	0.5	0.2

Low-frequency Currents

The mean magnitude of the low-frequency currents is similar to that of the tides. The net velocity (Table 4) varies with depth. Maximum velocities are not at the surface, but rather in the midwater: ~60m at Site 2 and ~110m, at Site 3. On both moorings, the mean velocities are weak at depth, decreasing to below 1 cm s^{-1} in the bottom of the water column. Unlike the tidal currents, the net direction tends to be parallel to the bathymetry.

Neighboring bins of velocity are well correlated. We calculated the complex correlation, i.e., the correlation between (u+*i*v) at one depth and (u+*i*v) in another depth, between the surface velocity and velocities at all other depth bins. The correlation decreases with increased distance from the surface (or bottom), as shown by Figures 4a and 4b. Depending upon the period examined, the depth at which the series become uncorrelated with the surface (or bottom) varies.. The cause of this variability may be seasonal forcing or other mechanisms. Examination of longer time series is necessary to resolve this question. During the warmer season, the time series become uncorrelated at a depth of 100-150m, while during the cooler season, the depth is deeper. The same is true for Site 3.

LA Site 2 6/15/2000 to 11/28/2001				
Mean Depth (m)	Mean_u (cm s^{-1})	Mean_v (cm s^{-1})	Velocity (cm s^{-1})	Dir (°T)
26	-3.2	3.1	4.45	314
34	-4.73	3.63	5.96	308
43	-5.84	4.06	7.11	305
51	-6.33	4.46	7.75	305
59	-6.4	4.75	7.97	307
68	-6.12	4.66	7.69	307
75	-3.69	2.3	4.35	302
83	-5.23	3.97	6.57	307
91	-4.62	3.35	5.71	306
99	-3.95	2.85	4.87	306
106	-3.54	2.66	4.43	307
114	-2.9	2.27	3.68	308
123	-2.38	1.89	3.04	308
131	-1.93	1.63	2.52	310
139	-1.54	1.35	2.05	311
148	-1.29	1.17	1.75	312
154	-1.19	1.18	1.68	315
163	-0.99	1.03	1.43	316
171	-0.87	0.9	1.25	316
179	-0.71	0.75	1.03	317
186	-0.62	0.7	0.93	319
194	-0.38	0.47	0.61	321
203	-0.21	0.26	0.34	321
211	-0.12	0.18	0.22	325
219	-0.1	0.25	0.27	338
226	-0.14	0.26	0.3	332

LA Site 3 6/15/2000 to 9/8/2000 and 11/15/2000 to /11/28/2001				
Mean Depth (m)	Mean_u (cm s^{-1})	Mean_v (cm s^{-1})	Velocity (cm s^{-1})	Dir (°T)
47	0.7	1.33	1.5	28
57	-2.65	1.85	3.23	305
63	-3.1	1.96	3.67	302
71	-3.93	2.23	4.52	300
79	-4.72	2.53	5.36	298
87	-5.21	2.65	5.84	297
95	-5.63	2.82	6.3	297
105	-5.96	2.89	6.62	296
109	-5.92	2.85	6.57	296
115	-5.87	2.84	6.52	296
127	-5.88	2.83	6.53	296
137	-5.72	2.69	6.32	295
141	-5.61	2.63	6.19	295
149	-5.56	2.53	6.11	294
157	-5.26	2.42	5.79	295
169	-4.86	2.16	5.31	294
173	-4.73	2.1	5.18	294
185	-4.17	1.91	4.59	295
191	-3.97	1.87	4.39	295
201	-3.42	1.64	3.79	296
207	-3.23	1.55	3.58	296
217	-2.77	1.35	3.08	296
223	-2.65	1.3	2.95	296
233	-2.25	1.11	2.51	296
239	-2.1	1.06	2.36	297
249	-1.68	0.91	1.91	298
255	-1.54	0.87	1.76	299
261	-1.39	0.82	1.62	301
271	-1.1	0.8	1.35	306
281	-0.89	0.7	1.14	308
287	-0.77	0.69	1.03	312
293	-0.62	0.65	0.9	316
303	-0.5	0.64	0.81	322
309	-0.4	0.62	0.73	327
319	-0.22	0.56	0.6	338
329	-0.12	0.49	0.51	346
335	-0.09	0.48	0.49	349
345	-0.1	0.42	0.43	347
351	-0.07	0.36	0.37	348
361	-0.07	0.3	0.31	346
367	-0.05	0.27	0.28	350
377	-0.12	0.25	0.27	334
383	-0.17	0.24	0.29	325
393	-0.28	0.21	0.35	306
399	-0.33	0.17	0.38	298
403	-0.34	0.19	0.39	299
415	-0.5	0.16	0.53	288

Table 4. Mean statistics for velocity in each depth bin as measured by the ADCPs.

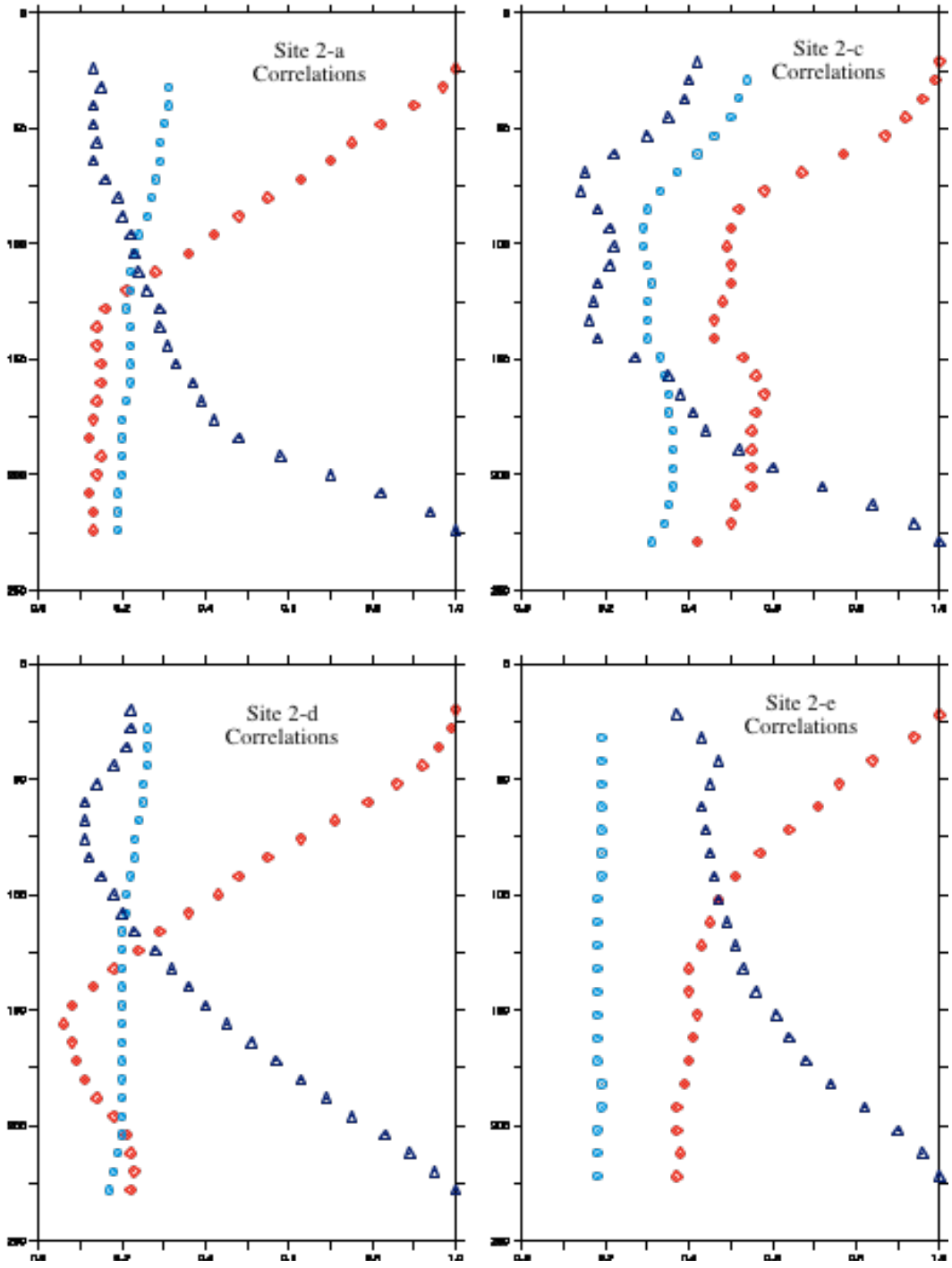


Figure 4a. Complex correlations for Site 2 between currents in each bin with the surface (red) and the bottom (dark blue) currents. The light blue is the 95% confidence level. Values to the right of the light blue points are significantly correlated at the 95% significance level and those to the left are not. (See Kundu, P. K, 1976, *J. Phys. Ocean.*, vol. 6, 181-199.)

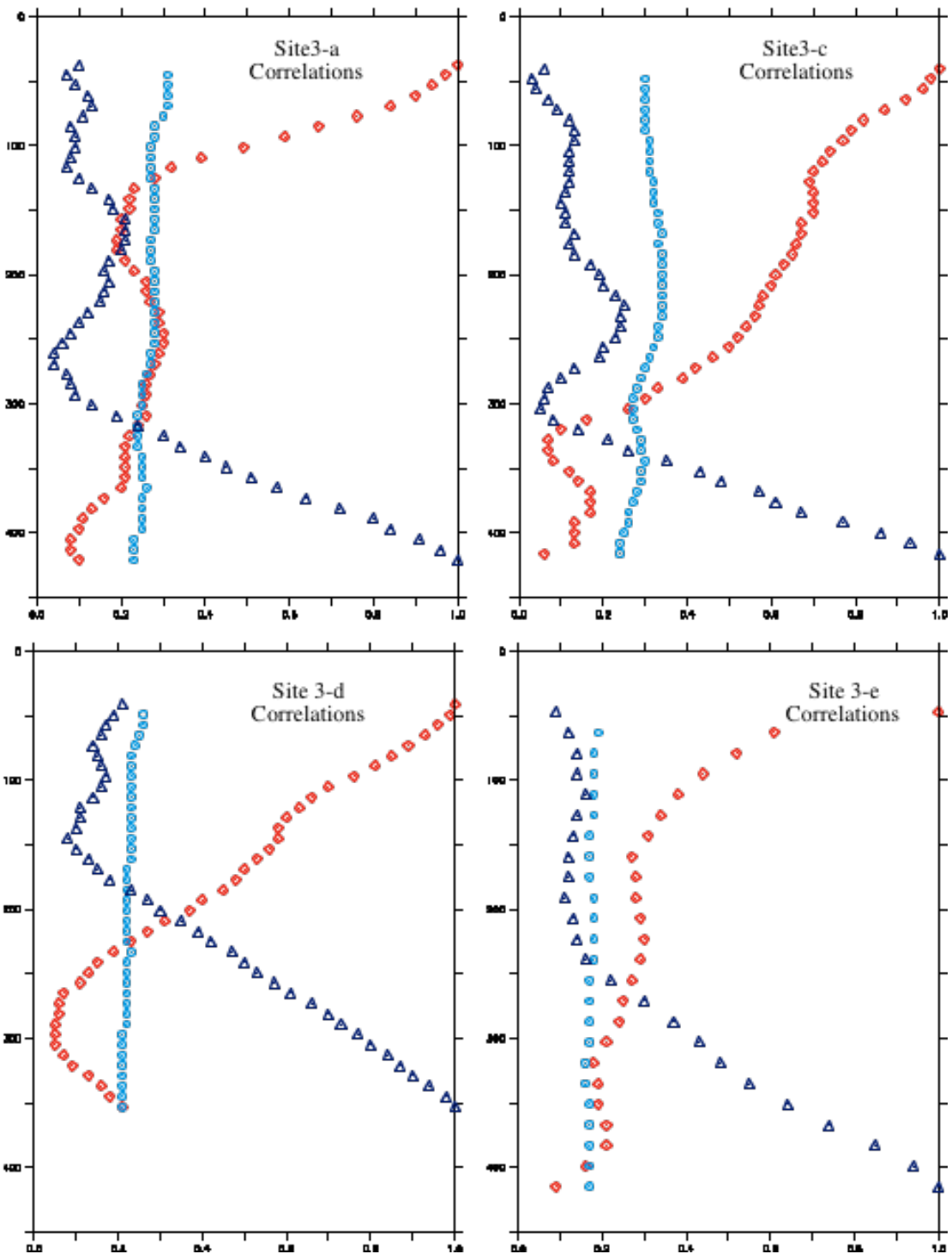


Figure 4b. Complex correlations for Site 3 between the currents in each bin with the surface (red) and the bottom (dark blue) currents. The light blue is the 95% confidence level. Values to the right of the light blue points are significantly correlated at the 95% significance level and those to the left are not. (See Kundu, P. K, 1976, *J. Phys. Ocean.*, vol. 6, 181-199.)

The integral time scales vary from ~1 day near the bottom to ~4 days near the surface at Site 2, and from ~1.5 days near the bottom to ~ 5 days near the surface at Site 3. The variability of the current is evident in the two time series shown in Figure 5. The event scale variability is prominent in both these time series. Although the integral time scale is only a few days, there is also strong variability on scales of a month or longer. This longer-term variability is evident in both time series, although they do not appear well correlated. The forcing of the short-term variability is largely storm driven, but the mechanisms that force longer scales' variability is not known.

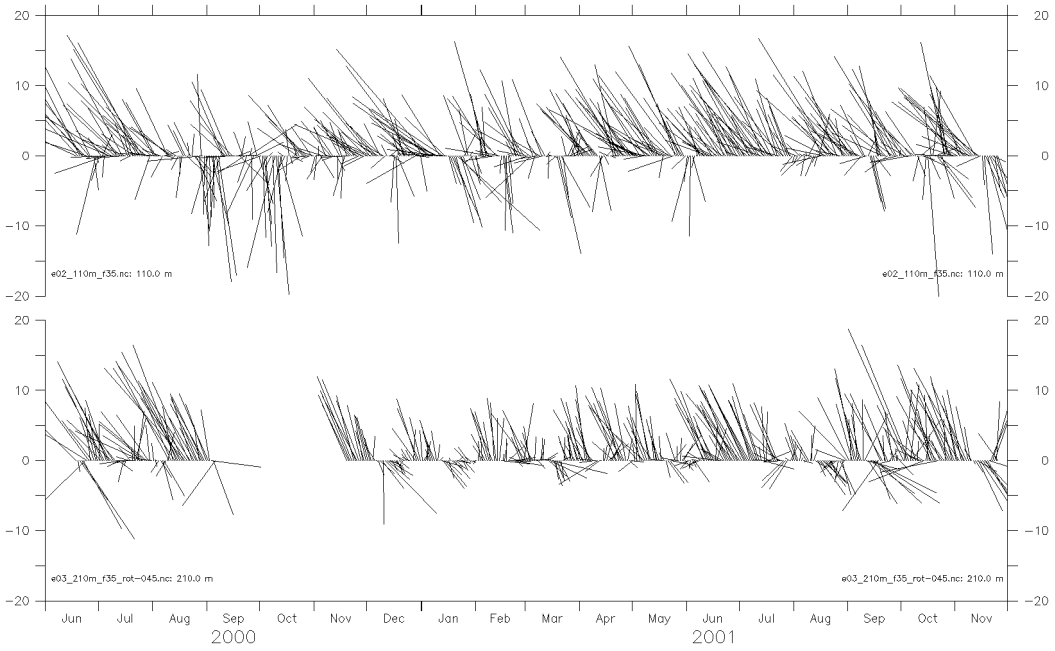


Figure 5. The low-pass filtered data from the mid water at Sites 2 (top) and 3 (bottom). The currents at Site 3 have been rotated 45° clockwise so that they are easier to view.

An important consideration for transport is the maximum velocity at various depths. First consider Site 2. There is strong seasonality to the maximum velocity (low-pass filtered data) at the surface, with maximum speeds >48 cm s^{-1} during the fall and winter, and ~35 cm s^{-1} during the spring and summer. Maximum speeds at depth are usually <20 cm s^{-1}, although during the last deployment (June-November 2001), maximum speeds in the bottom 100m exceeded 25 cm s^{-1}. At Site 3, the speeds are generally weaker but with the same seasonal pattern. Maximum speeds near the bottom are 10-15 cm s^{-1} during all deployments. The greatest variability in currents is in these events in which maximum bottom currents can be ~100 times stronger than the mean velocity. It is important to consider these events of high-speed currents when considering transport of particles in the water column. They are more important than the mean velocities that are often very weak.

In summary, the currents were well correlated in the upper 100m and in the lower 100m. It is clear that the longer time scale (months) variability at both moorings is forced by the same larger scale mechanisms. The difficulty in modeling this region will be understanding these broader scale mechanisms that apparently cause intrusions onto the slope, and enhanced along shelf flow. While the mean currents are weak at depth, there are episodic events where currents

can be relatively strong. Dumping of materials during such times would cause significant dispersion. The cause of the these episodic events of strong currents are not local, but are likely forced on larger scales. The influence of eddies, ENSO and other mechanisms are likely important, and a good basin scale model would be useful in now casting currents and understanding mechanisms. The data collected by this project can provide ground truth for any such model runs.

Appendix 1. CTD Data Plots

A1-2 through A1-5: Summary plots of temperature (°C) versus depth (m) at all sites for July 2000, May 2001, November 2001 and February 2002.

A1-6 through A1-9: Summary plots of salinity (psu) versus depth (m) at all sites for July 2000, May 2001, November 2001, and February 2002.

A1-10 through A1-19: Individual plots of temperature (°C) versus depth (m) for July 2000.

A1-20 through A1-29: Individual plots of salinity (psu) versus depth (m) for July 2000.

A1-30 through A1-39: Individual plots of temperature (°C) versus depth (m) for May 2001.

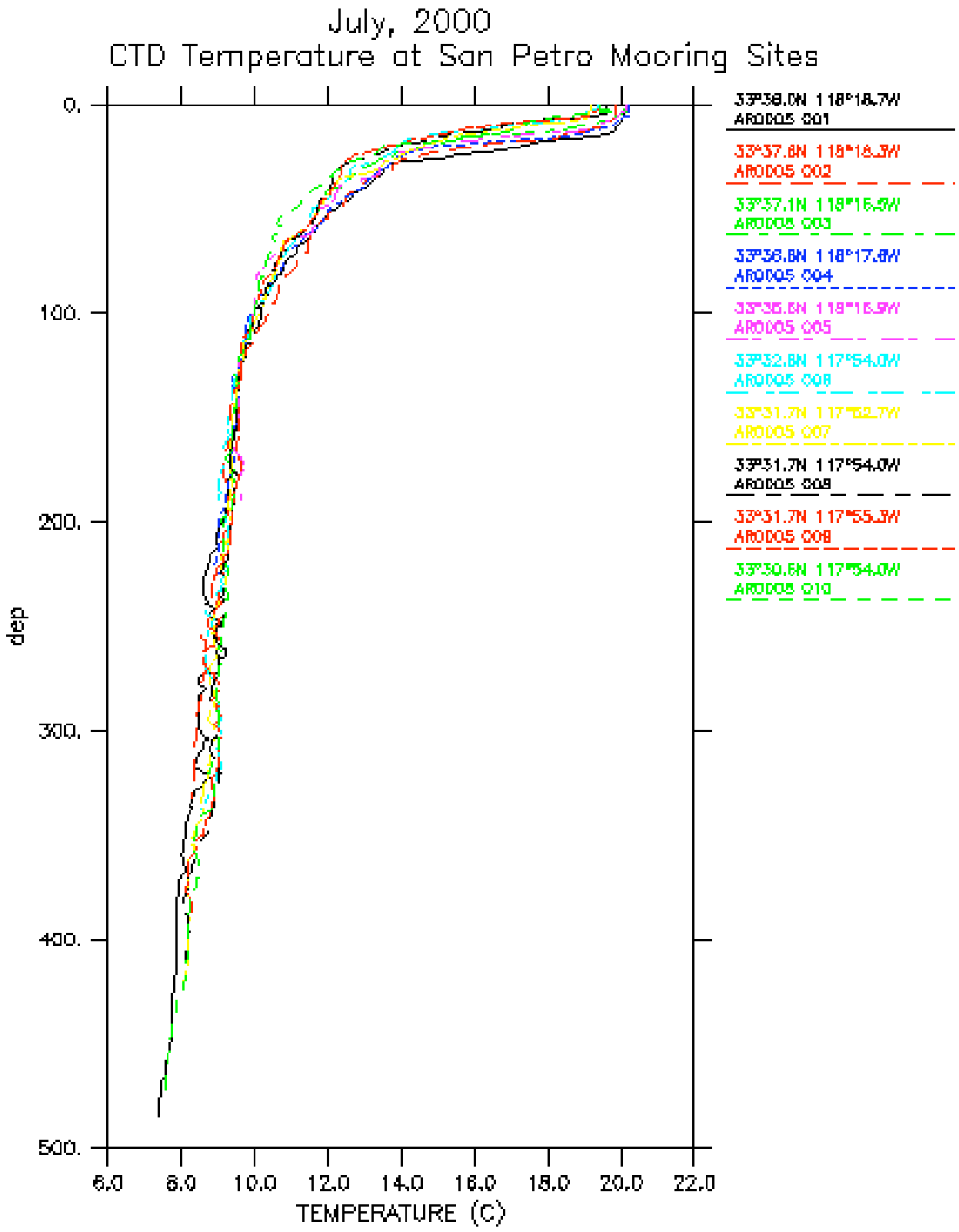
A1-40 through A1-49: Individual plots of salinity (psu) versus depth (m) for May 2001.

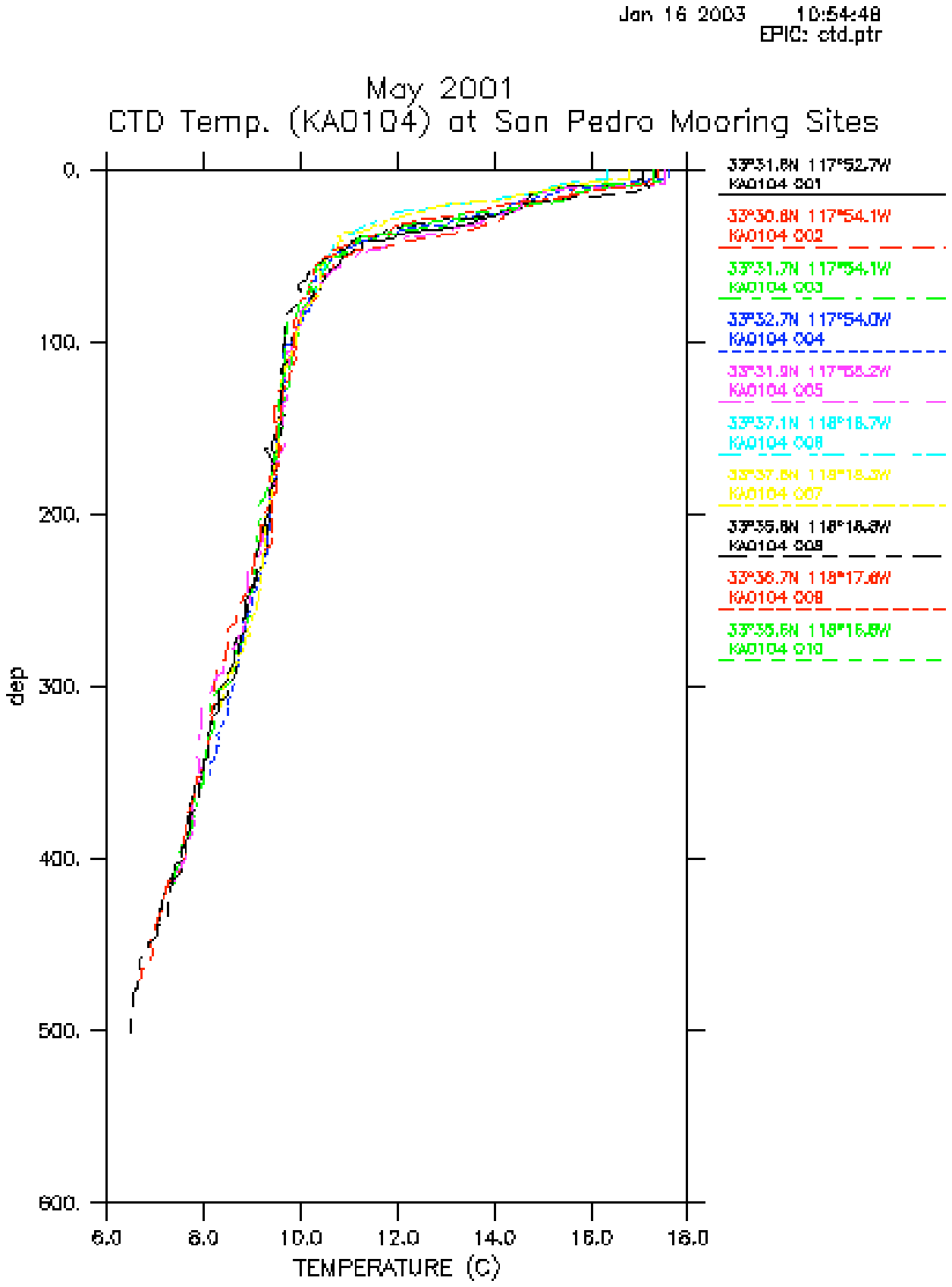
A1-50 through A1-55: Individual plots of temperature (°C) versus depth (m) for November 2001.

A1-56 through A1-61: Individual plots of salinity (psu) versus depth (m) for November 2001.

A1-62 through A1-71: Individual plots of temperature (°C) versus depth (m) for February 2002.

A1-72 through A1-81: Individual plots of salinity (psu) versus depth (m) for February 2002.


July, 2000
CTD Temperature at San Petro Mooring Sites
dep
0.
100.
200.
300.
400.
500.
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
TEMPERATURE (C)
33°38.0N 118°18.7W
AR0005 001
33°37.8N 118°18.3W
AR0005 002
33°37.1N 118°16.9W
AR0005 003
33°36.8N 118°17.8W
AR0005 004
33°36.6N 118°16.9W
AR0005 005
33°32.8N 117°54.0W
AR0005 006
33°31.7N 117°52.7W
AR0005 007
33°31.7N 117°54.0W
AR0005 008
33°31.7N 117°55.3W
AR0005 009
33°30.6N 117°54.0W
AR0005 010


Jan 16 2003 10:54:48
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May 2001
CTD Temp. (KA0104) at San Pedro Mooring Sites
dep
0.
100.
200.
300.
400.
500.
600.
6.0
8.0
10.0
12.0
14.0
16.0
18.0
TEMPERATURE (C)
33°31.8N 117°52.7W
KA0104 001
33°30.8N 117°54.1W
KA0104 002
33°31.7N 117°54.1W
KA0104 003
33°32.7N 117°54.0W
KA0104 004
33°31.9N 117°55.2W
KA0104 005
33°37.1N 118°16.7W
KA0104 006
33°37.8N 118°15.2W
KA0104 007
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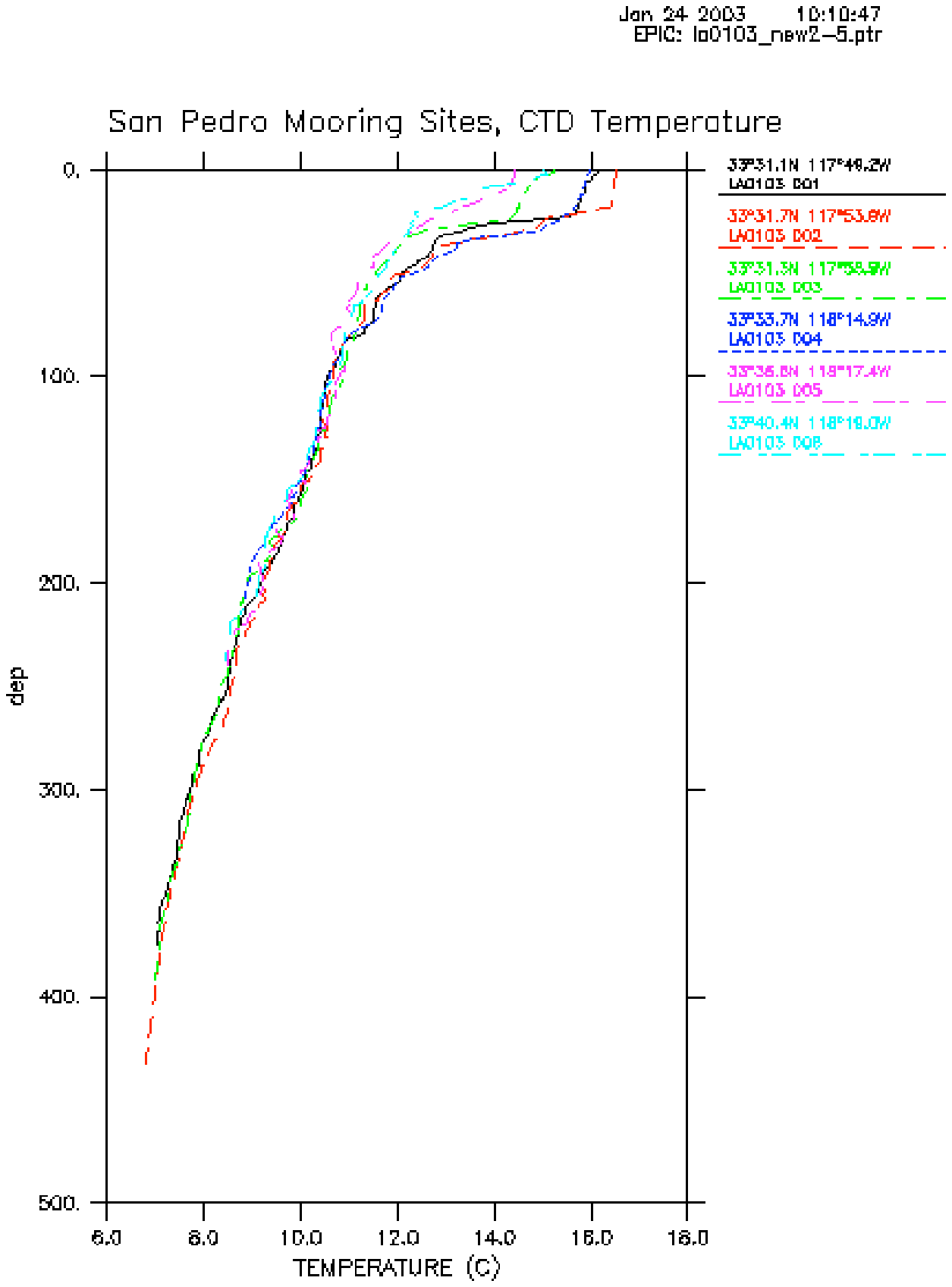
KA0104 009
33°35.6N 118°16.8W
KA0104 010


Jan 24 2003 10:10:47
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San Pedro Mooring Sites, CTD Temperature
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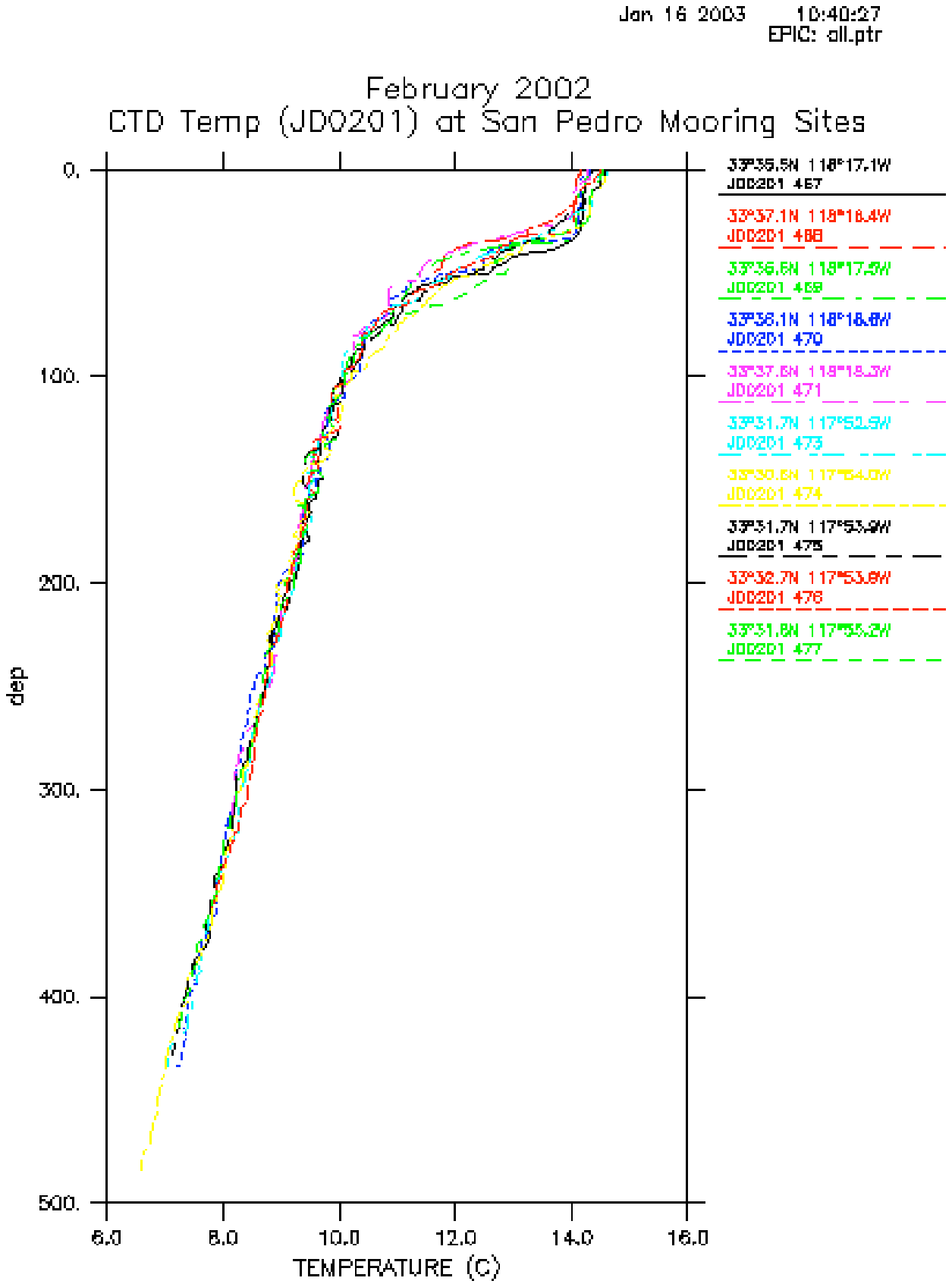
LA0103 D02
33°51.3N 117°58.9W
LA0103 D03
33°53.7N 118°14.9W
LA0103 D04
33°56.8N 118°17.4W
LA0103 D05
33°40.4N 118°19.0W
LA0103 D08
dep
0.
100.
200.
300.
400.
500.
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
TEMPERATURE (C)


Jan 16 2003 10:40:27
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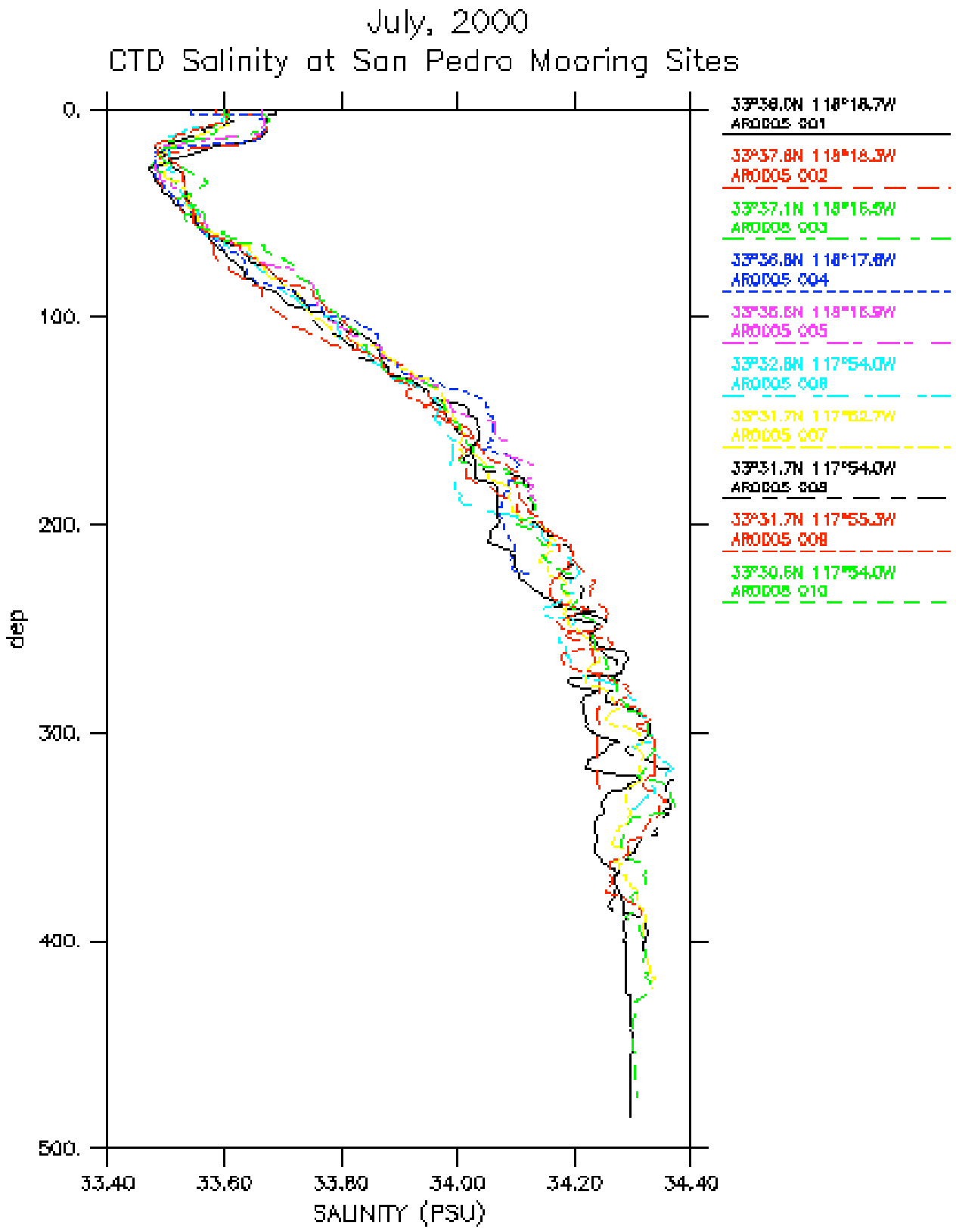
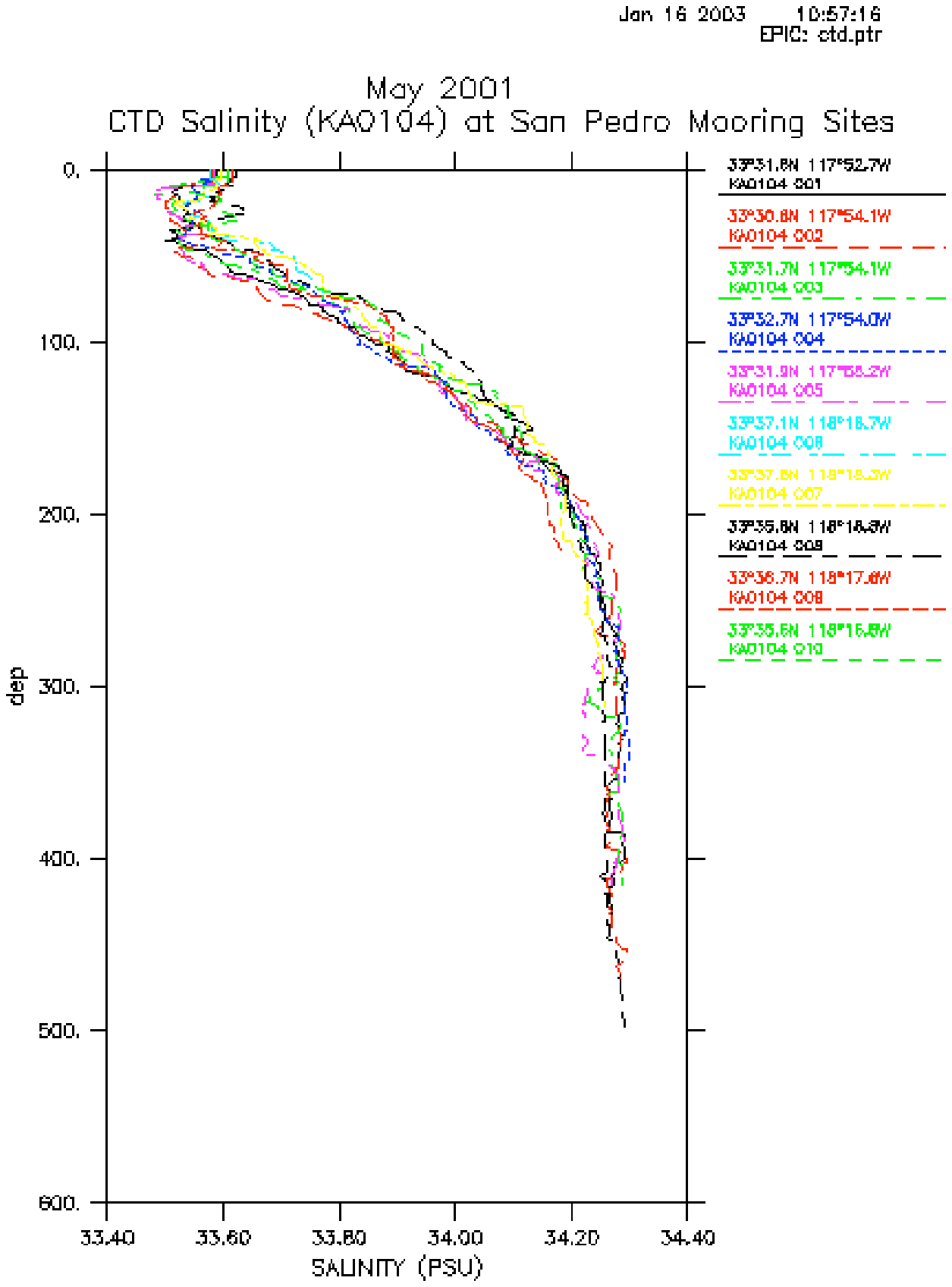
February 2002
CTD Temp (JD0201) at San Pedro Mooring Sites
0.
100.
200.
300.
400.
500.
dep
6.0
8.0
10.0
12.0
14.0
16.0
TEMPERATURE (C)
33°35.5N 118°17.1W
JD0201 467
33°37.1N 118°18.4W
JD0201 468
33°36.6N 118°17.9W
JD0201 469
33°38.1N 118°18.8W
JD0201 470
33°37.6N 118°18.3W
JD0201 471
33°31.7N 117°52.9W
JD0201 473
33°30.6N 117°54.0W
JD0201 474
33°31.7N 117°53.9W
JD0201 475
33°32.7N 117°53.8W
JD0201 476
33°31.6N 117°55.2W
JD0201 477


July, 2000
CTD Salinity at San Pedro Mooring Sites
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)
33°58.0N 118°18.7W
ARGO05 001
32°57.8N 118°18.3W
ARGO05 002
33°57.1N 118°16.9W
ARGO05 003
33°56.8N 118°17.8W
ARGO05 004
33°56.6N 118°16.9W
ARGO05 005
33°52.8N 117°54.0W
ARGO05 006
33°51.7N 117°52.7W
ARGO05 007
33°51.7N 117°54.0W
ARGO05 008
33°51.7N 117°55.3W
ARGO05 009
33°50.6N 117°54.0W
ARGO05 010


Jan 16 2003 10:57:16
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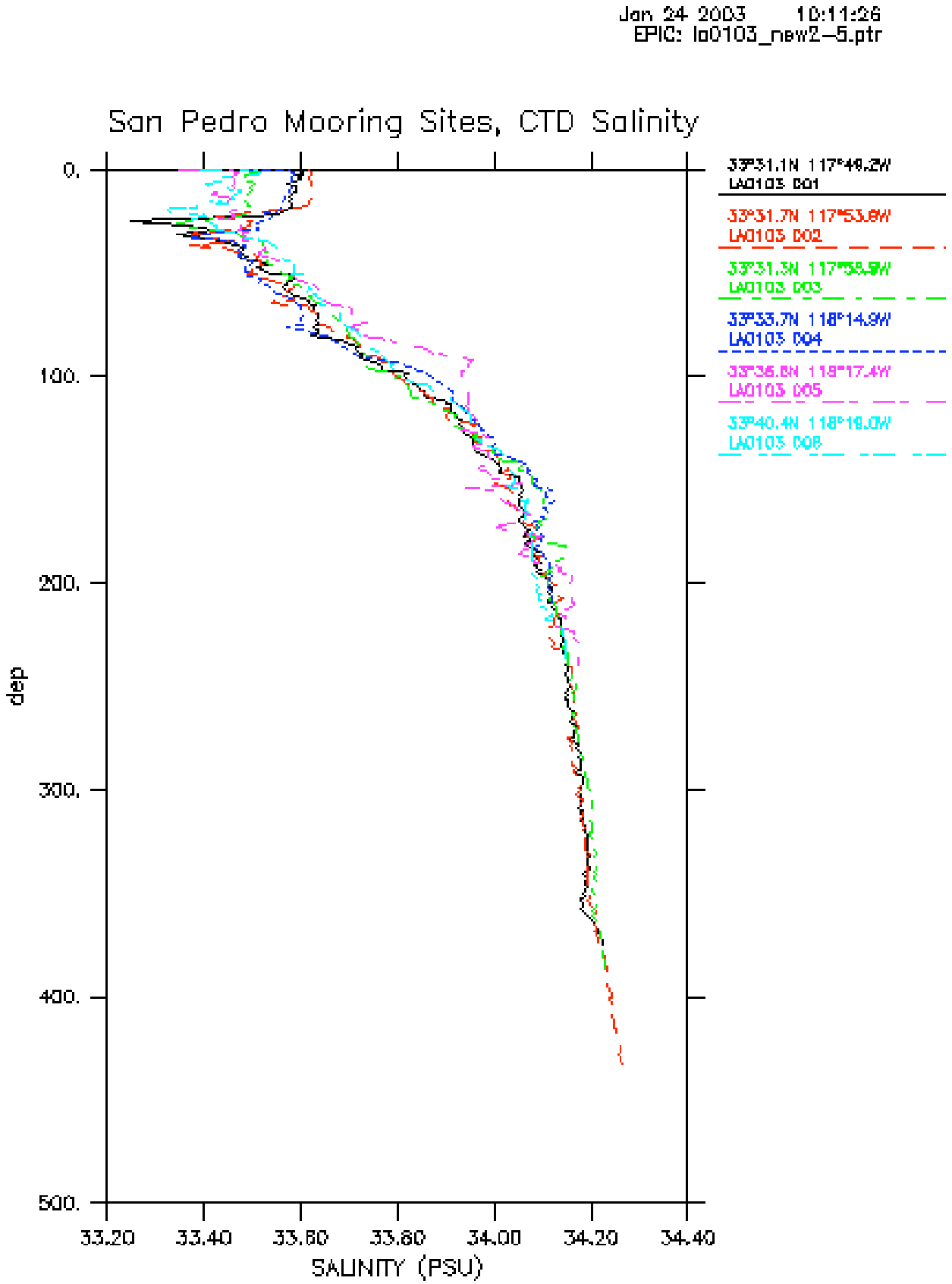
May 2001
CTD Salinity (KA0104) at San Pedro Mooring Sites
0.
100.
200.
300.
400.
500.
600.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)
33°31.8N 117°52.7W
KA0104 001
33°30.8N 117°54.1W
KA0104 002
33°31.7N 117°54.1W
KA0104 003
33°32.7N 117°54.0W
KA0104 004
33°31.9N 117°55.2W
KA0104 005
33°37.1N 118°16.7W
KA0104 006
33°35.8N 118°16.8W
KA0104 008
33°36.7N 118°17.6W
KA0104 009
33°35.6N 118°16.8W
KA0104 010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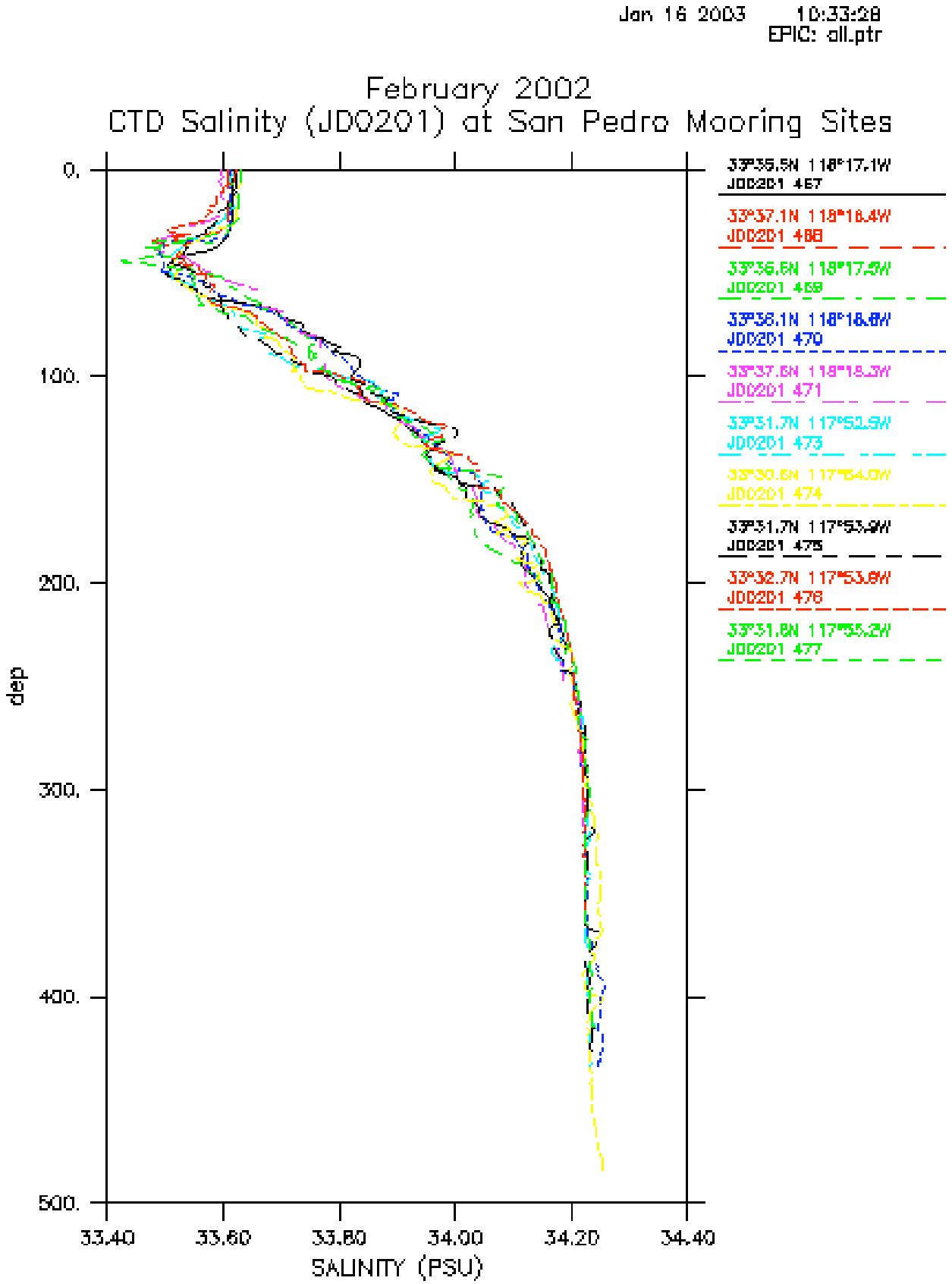
San Pedro Mooring Sites, CTD Salinity
33°51.1N 117°48.2W
LA0103 D01
33°51.7N 117°53.8W
LA0103 D02
33°51.3N 117°58.9W
LA0103 D03
33°53.7N 118°14.9W
LA0103 D04
33°56.8N 118°17.4W
LA0103 D05
33°40.4N 118°19.0W
LA0103 D08
0.
100.
200.
300.
400.
500.
dep
33.20
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)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February 2002
CTD Salinity (JD0201) at San Pedro Mooring Sites
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400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)
33°35.5N 118°17.1W
JD02D1 467
33°37.1N 118°18.4W
JD02D1 468
33°36.6N 118°17.9W
JD02D1 469
33°38.1N 118°18.8W
JD02D1 470
33°37.6N 118°18.3W
JD02D1 471
33°31.7N 117°53.9W
JD02D1 473
33°30.6N 117°54.0W
JD02D1 474
33°31.7N 117°53.9W
JD02D1 475
33°32.7N 117°53.8W
JD02D1 476
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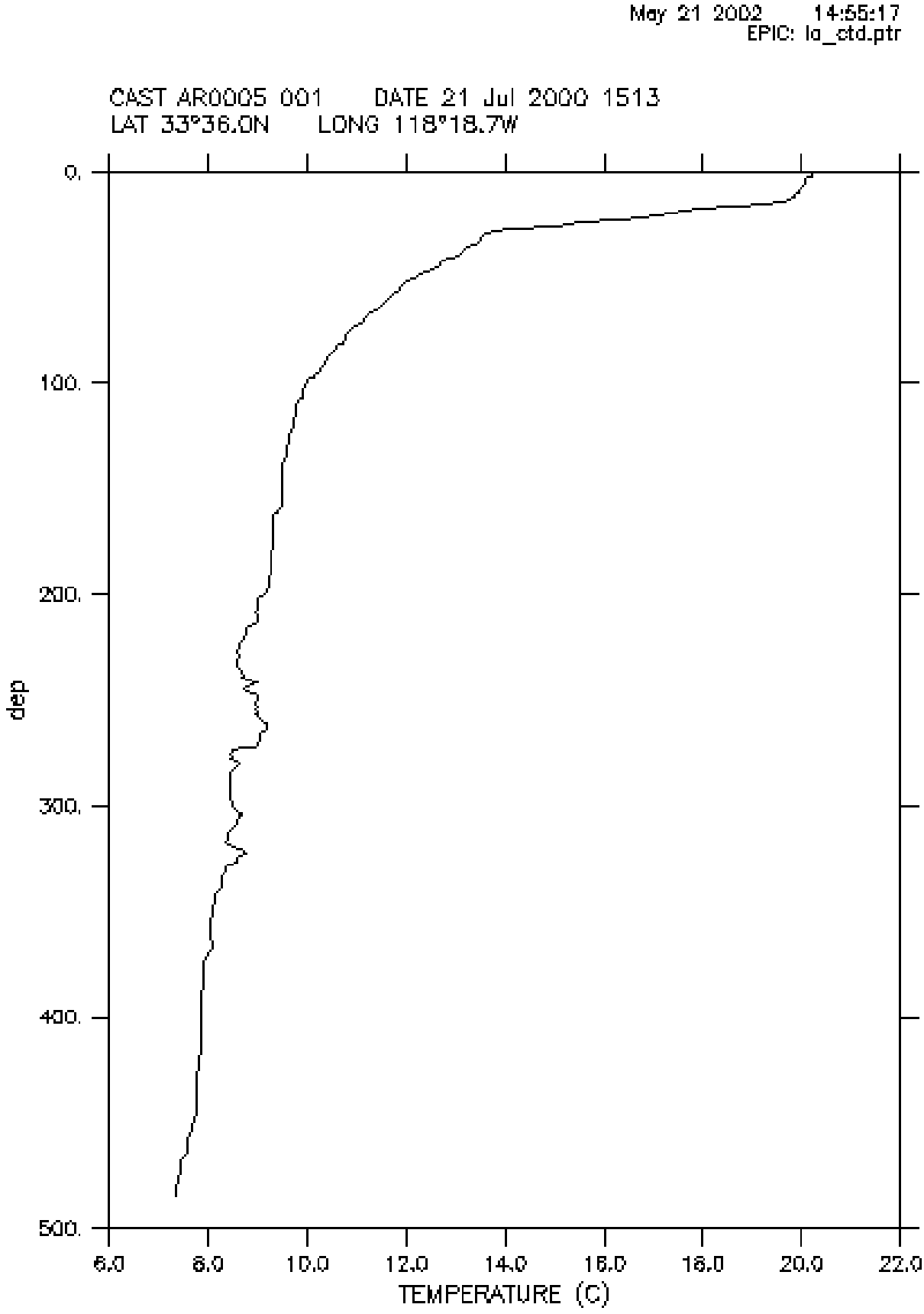
JD02D1 477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100.
200.
300.
400.
500.
dep
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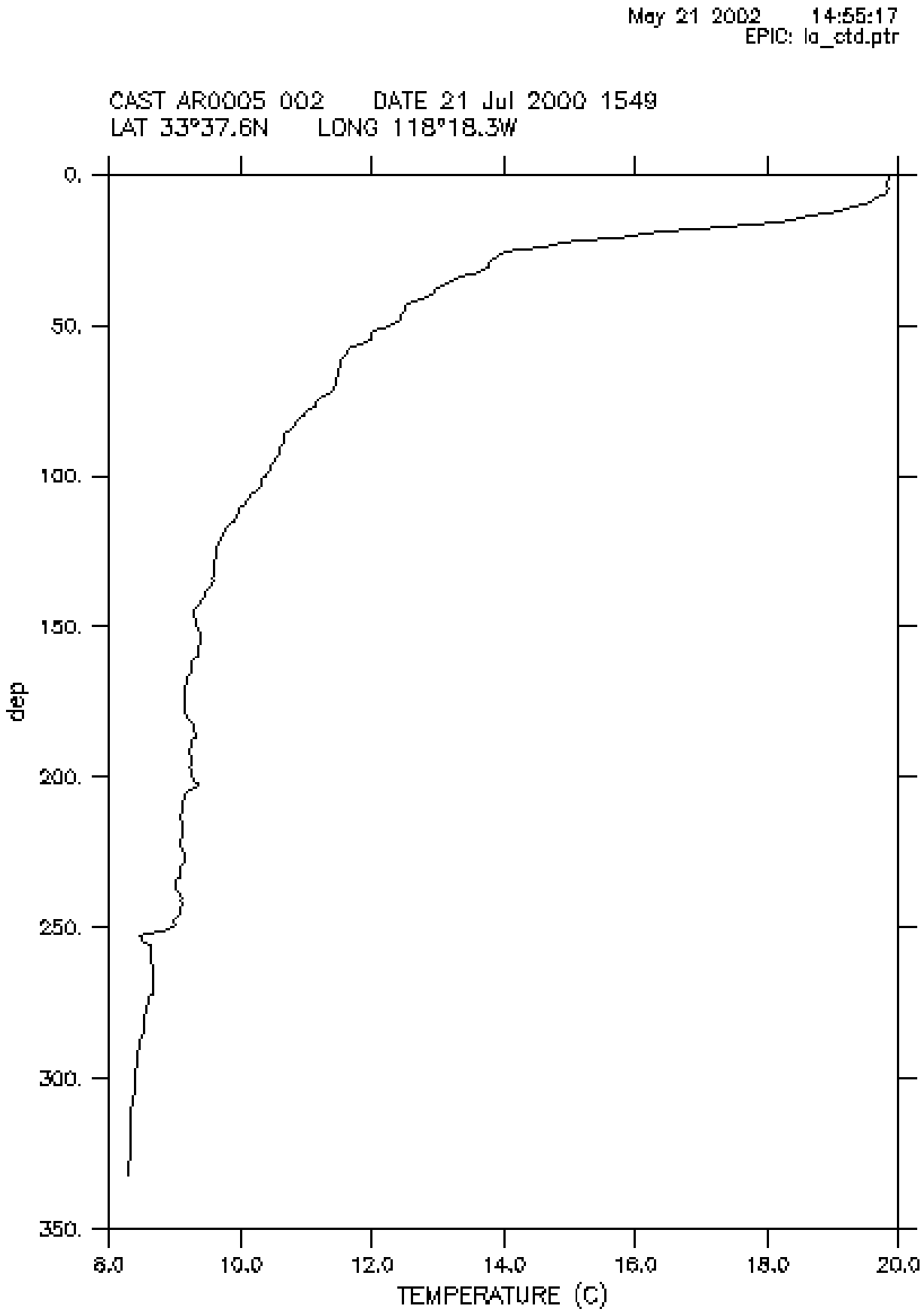
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
TEMPERATURE (C)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EPIC: la_ctd.ptr
CAST AR0005 002 DATE 21 Jul 2000 1549
LAT 33°37.6N LONG 118°18.3W
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50.
100.
150.
200.
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300.
350.
dep
6.0
10.0
12.0
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16.0
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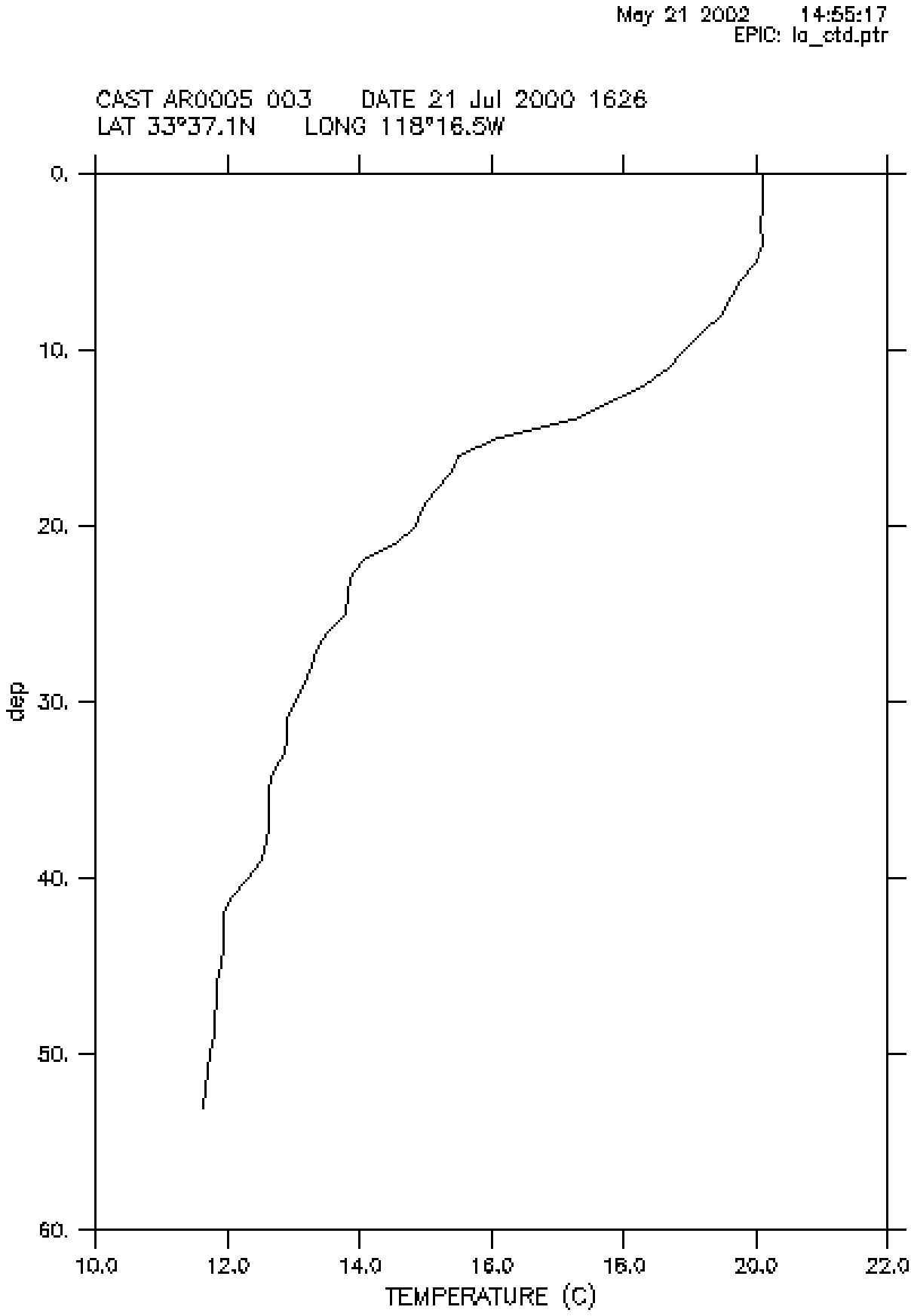
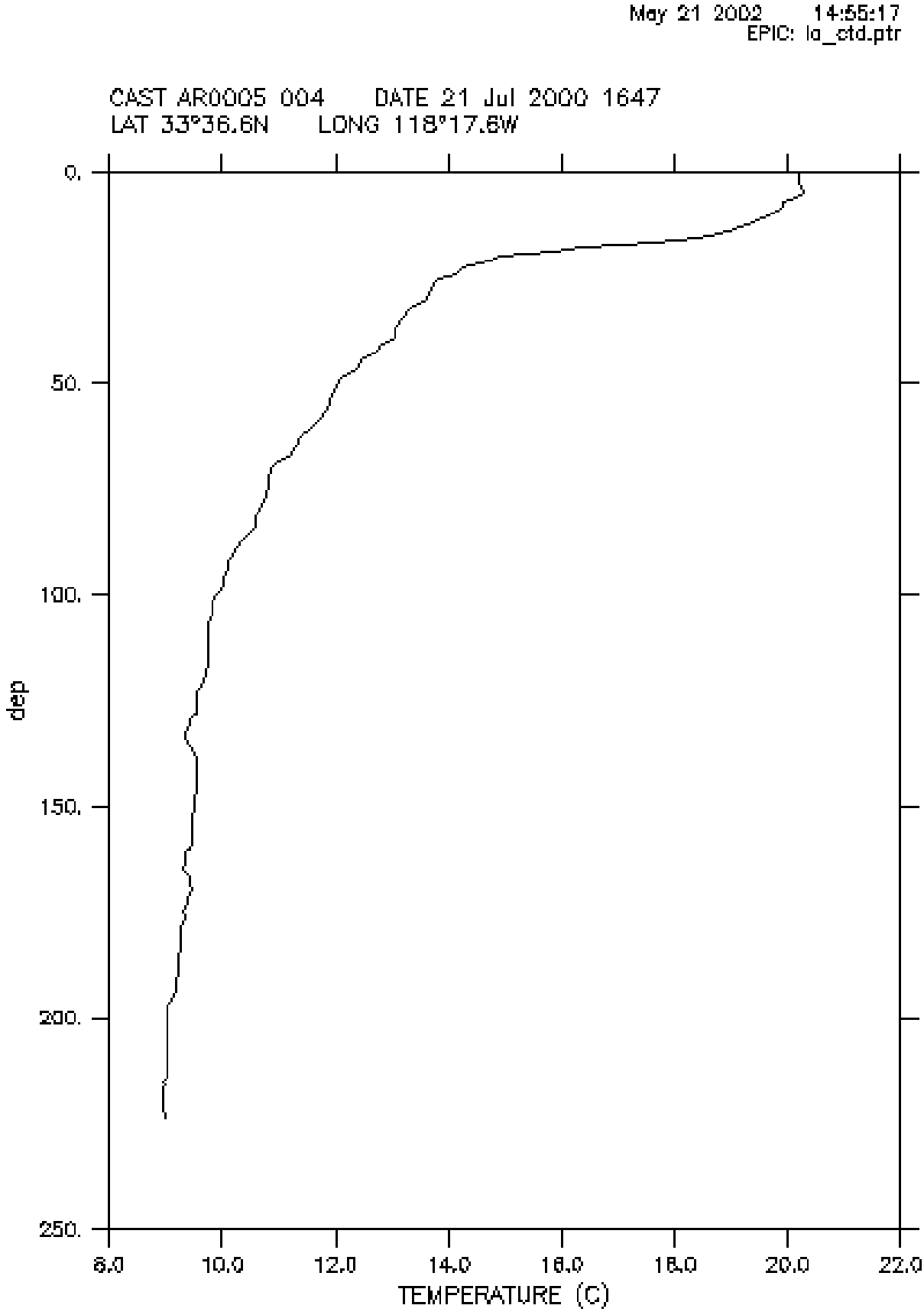
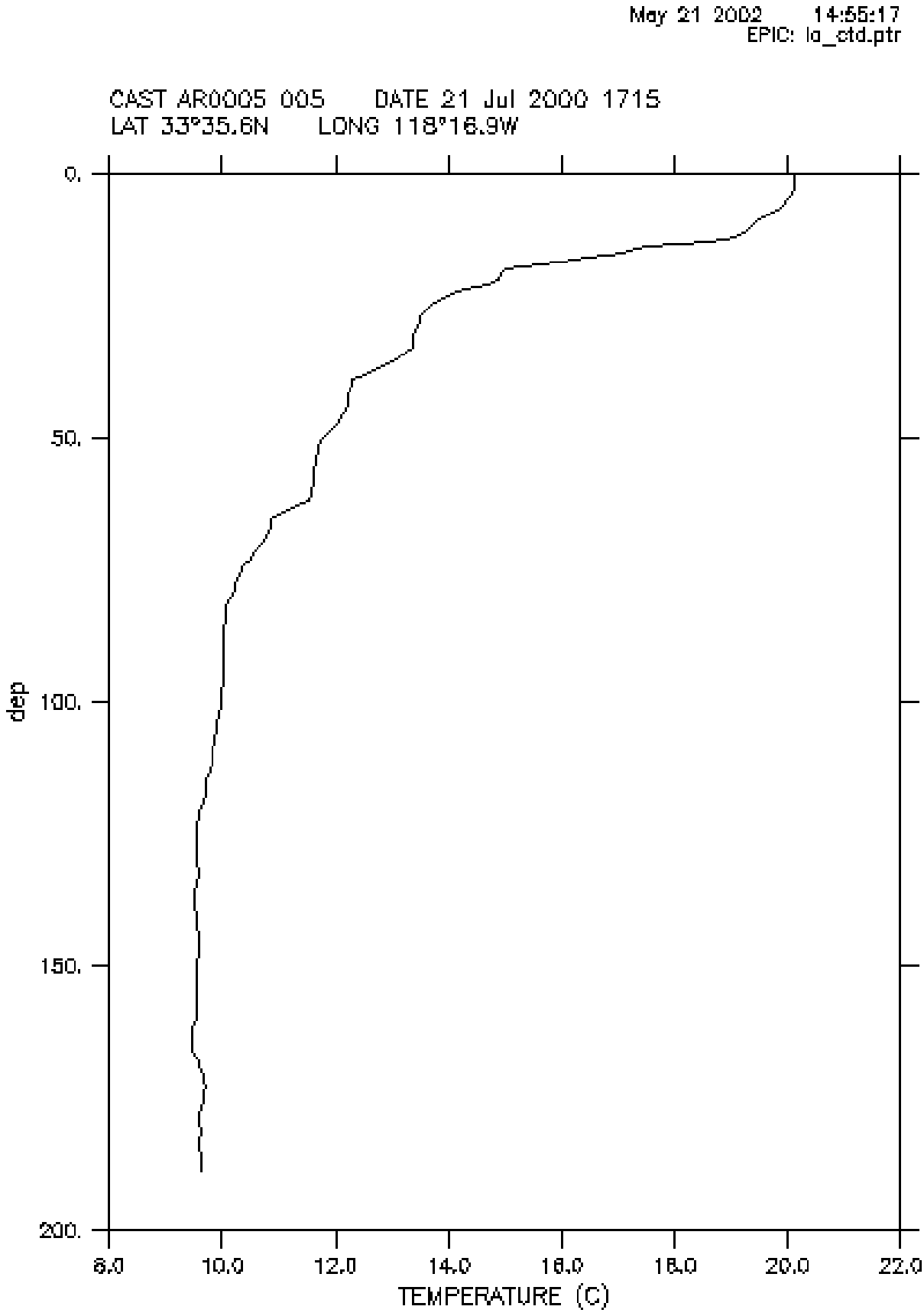
20.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 003 DATE 21 Jul 2000 1626
LAT 33°37.1N LONG 118°16.5W
dep
0.
10.
20.
30.
40.
50.
60.
10.0
12.0
14.0
16.0
18.0
20.0
22.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 004 DATE 21 Jul 2000 1647
LAT 33°36.6N LONG 118°17.6W
0.
50.
100.
150.
200.
250.
dep
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 005 DATE 21 Jul 2000 1715
LAT 33°35.6N LONG 118°16.9W
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50.
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dep
6.0
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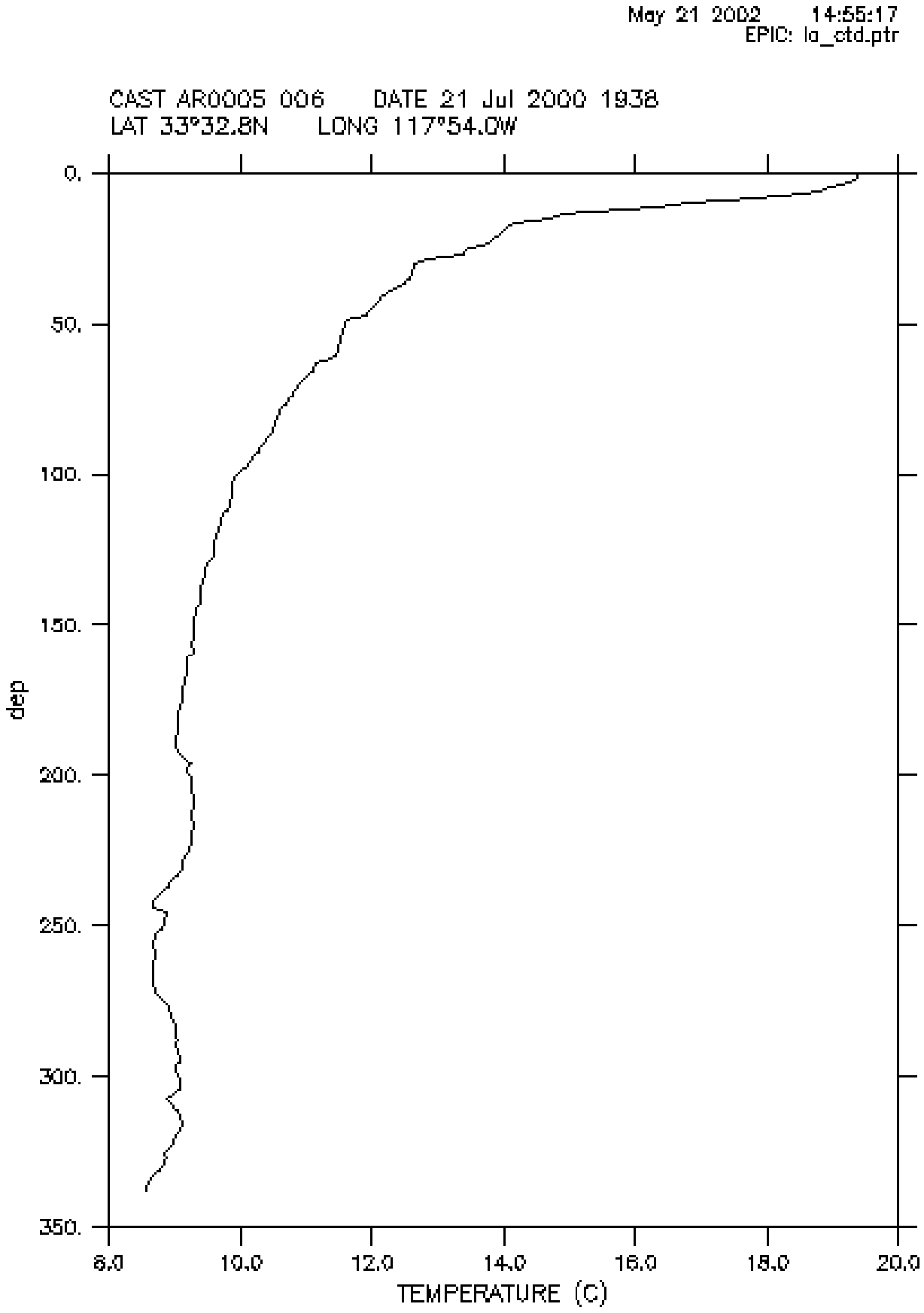
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 006 DATE 21 Jul 2000 1938
LAT 33°32.8N LONG 117°54.0W
dep
0.
50.
100.
150.
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300.
350.
6.0
10.0
12.0
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16.0
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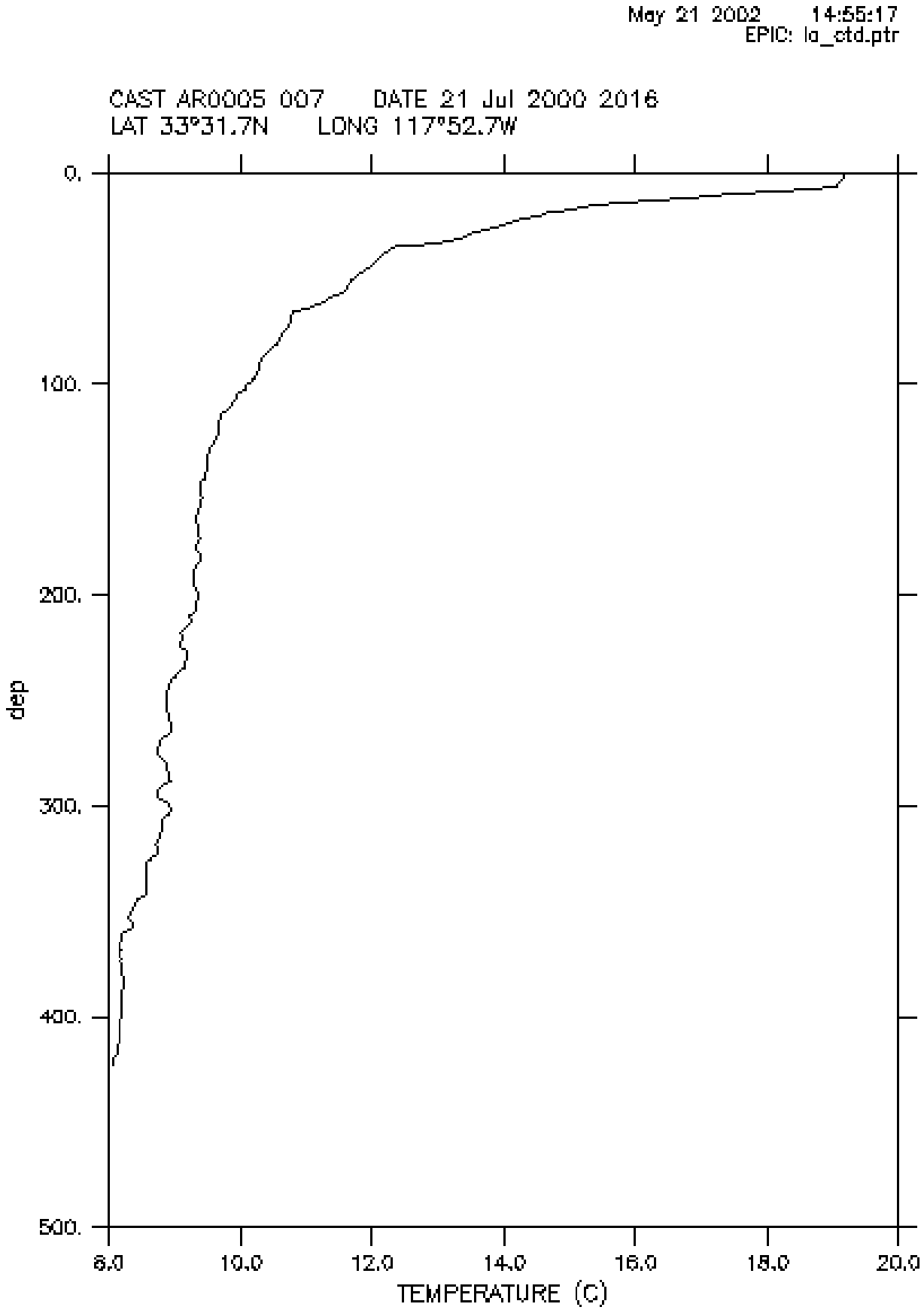
20.0
TEMPERATURE (C)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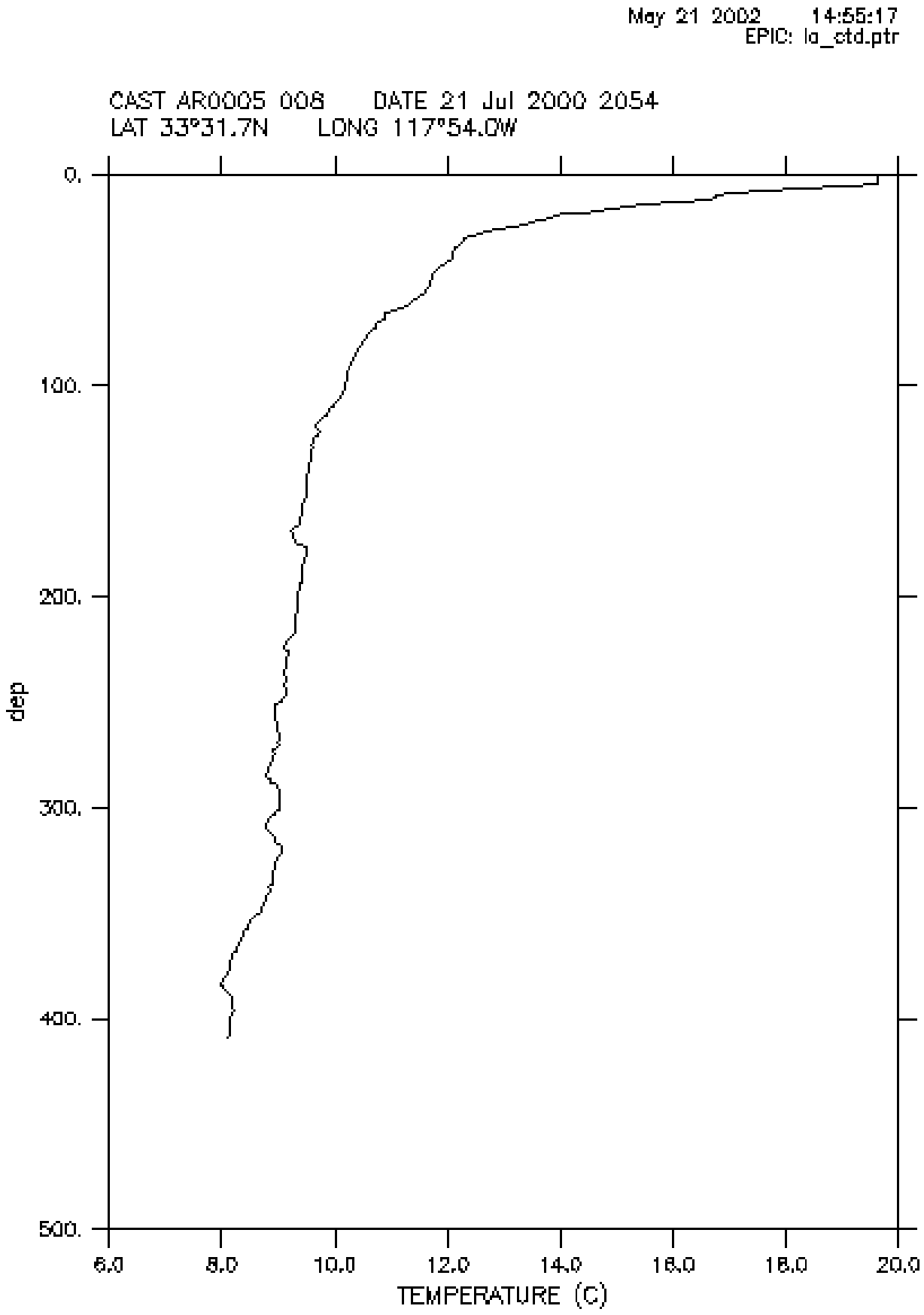
EPIC: la_ctd.ptr
CAST AR0005 007 DATE 21 Jul 2000 2016
LAT 33°31.7N LONG 117°52.7W
0.
100.
200.
300.
400.
500.
dep
6.0
10.0
12.0
14.0
16.0
18.0
20.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 008 DATE 21 Jul 2000 2054
LAT 33°31.7N LONG 117°54.0W
0.
100.
200.
300.
400.
500.
dep
6.0
8.0
10.0
12.0
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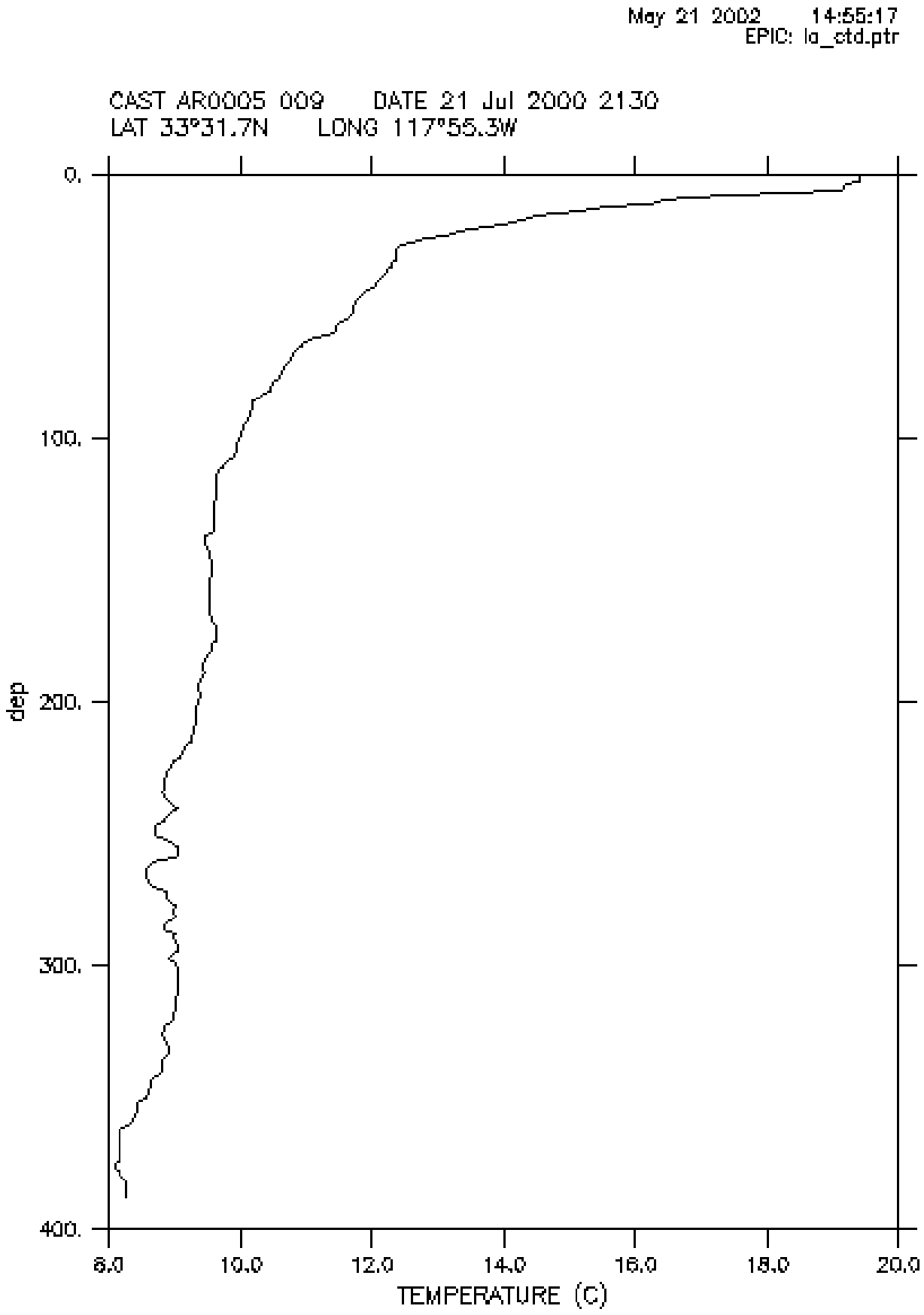
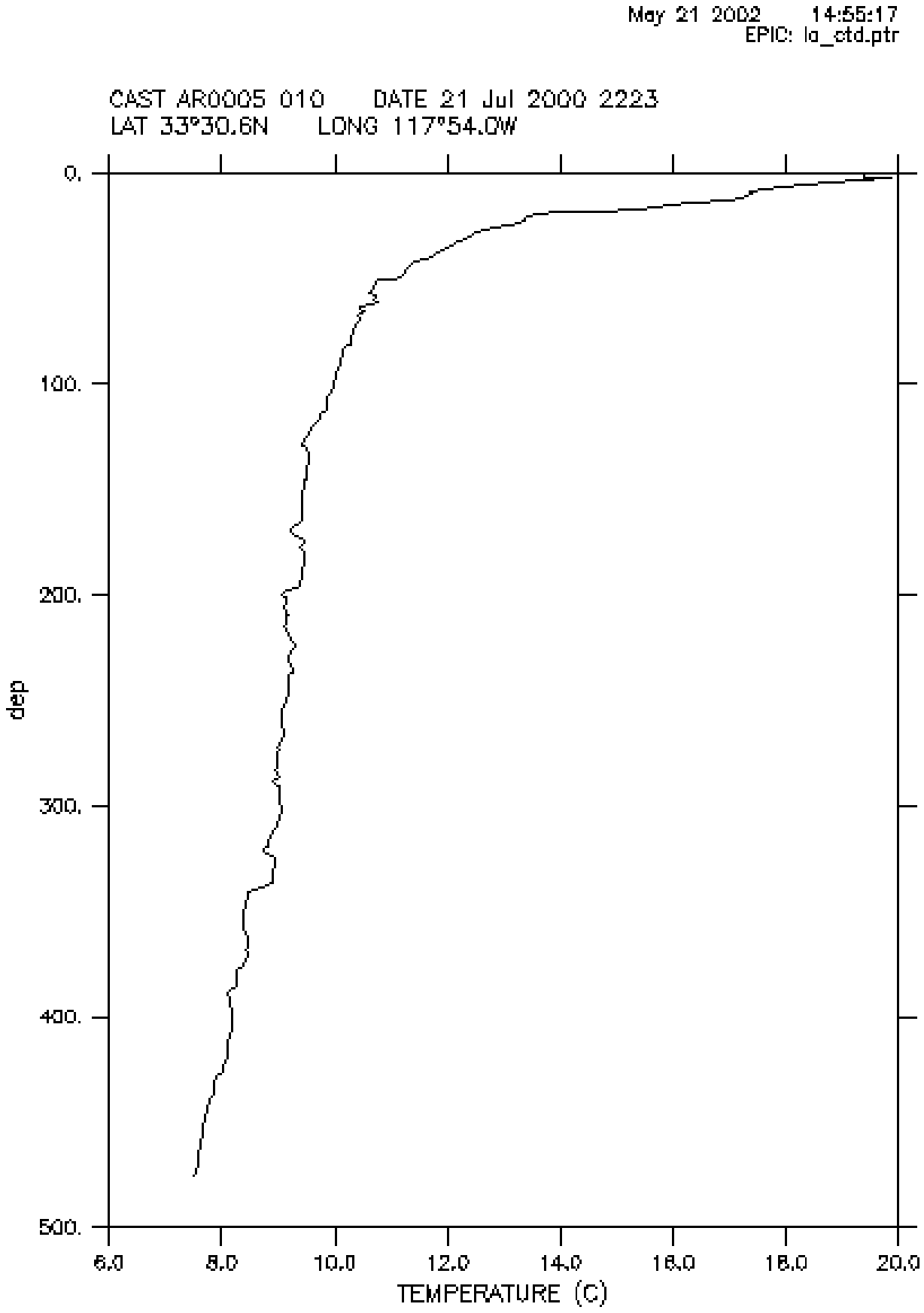
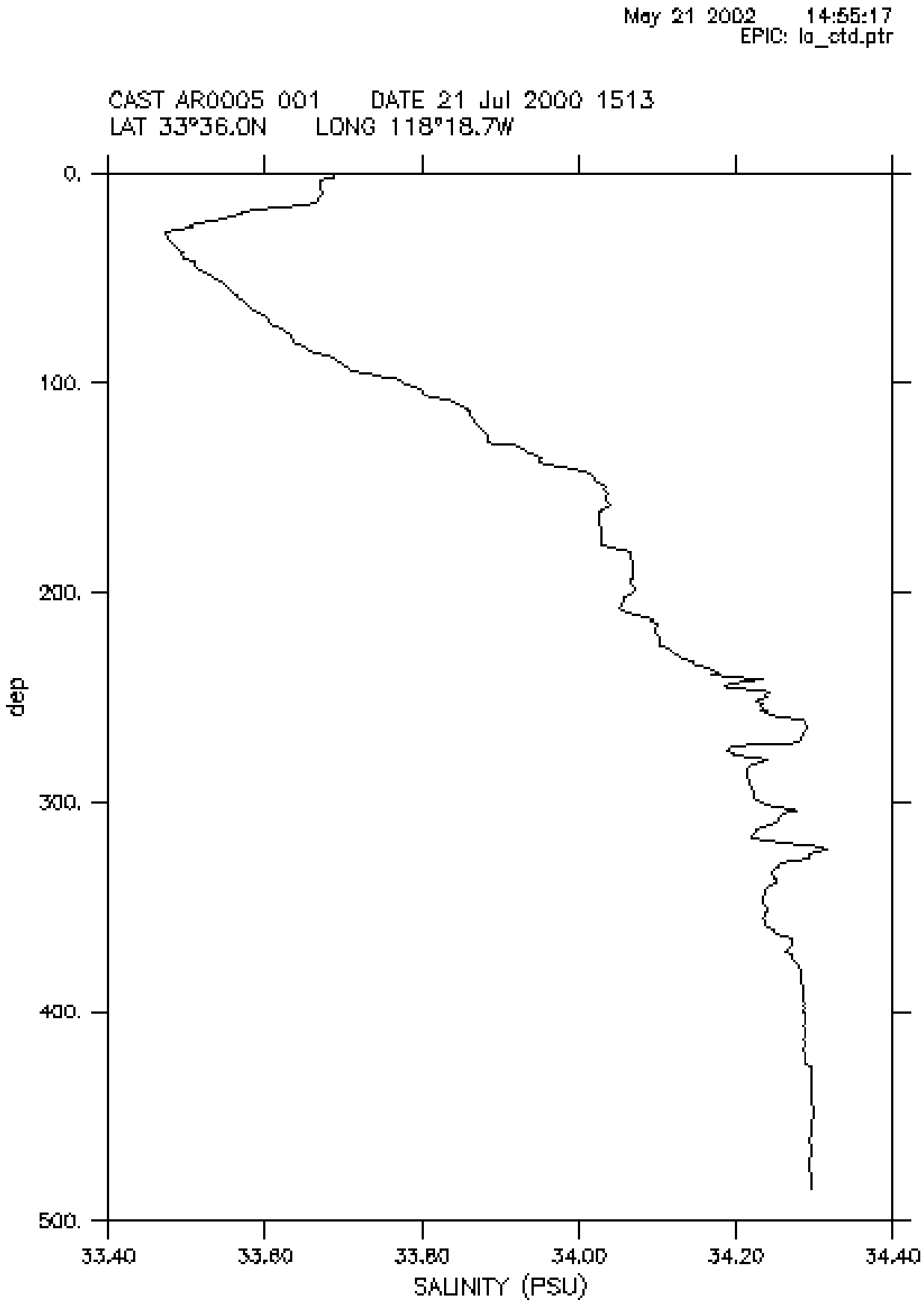
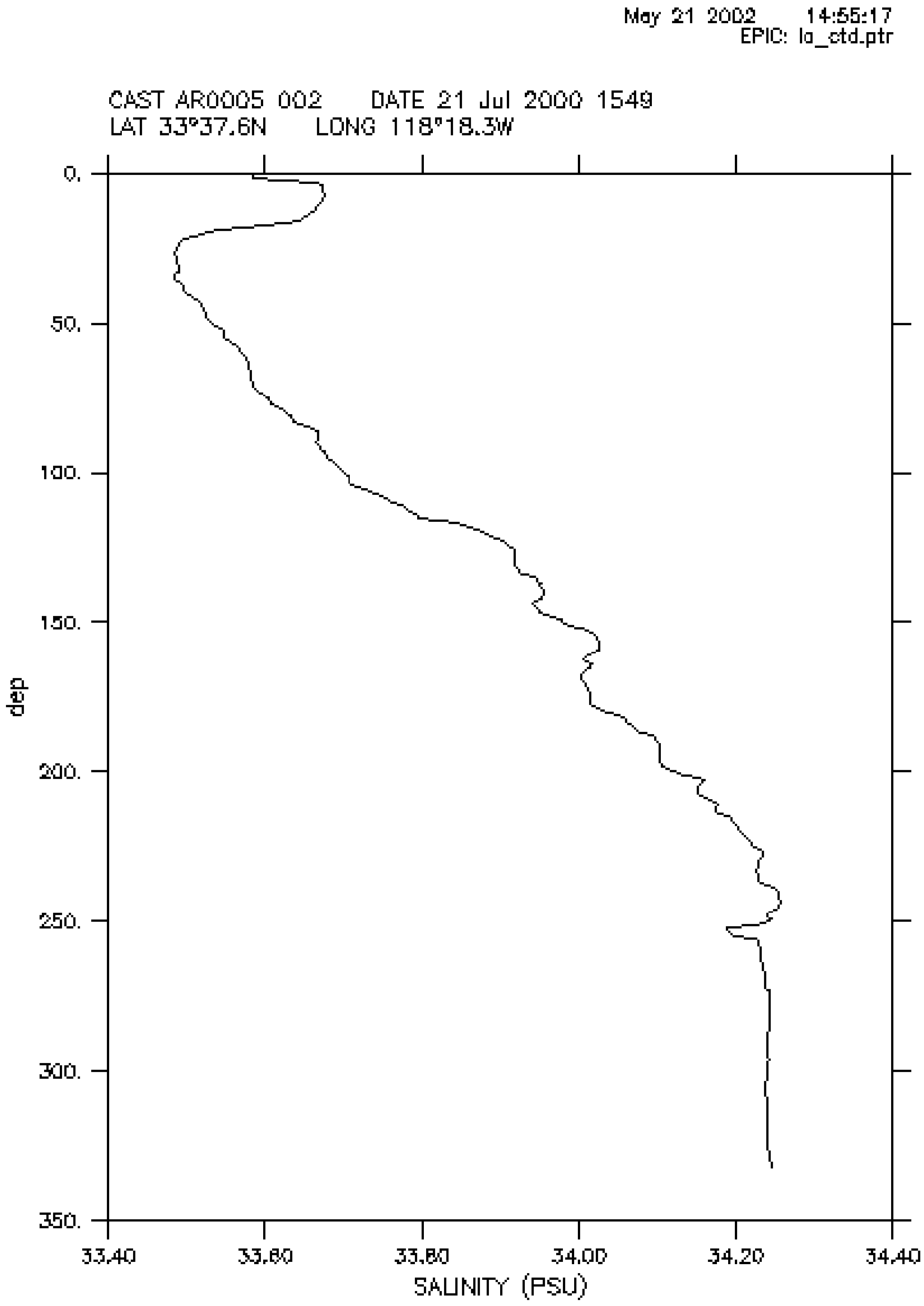
16.0
18.0
20.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 009 DATE 21 Jul 2000 2130
LAT 33°31.7N LONG 117°55.3W
0.
100.
200.
300.
400.
dep
6.0
10.0
12.0
14.0
16.0
18.0
20.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 010 DATE 21 Jul 2000 2223
LAT 33°30.6N LONG 117°54.0W
0.
100.
200.
300.
400.
500.
dep
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
TEMPERATURE (C)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 001 DATE 21 Jul 2000 1513
LAT 33°36.0N LONG 118°18.7W
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 002 DATE 21 Jul 2000 1549
LAT 33°37.6N LONG 118°18.3W
0.
50.
100.
150.
200.
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300.
350.
dep
33.40
33.60
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34.00
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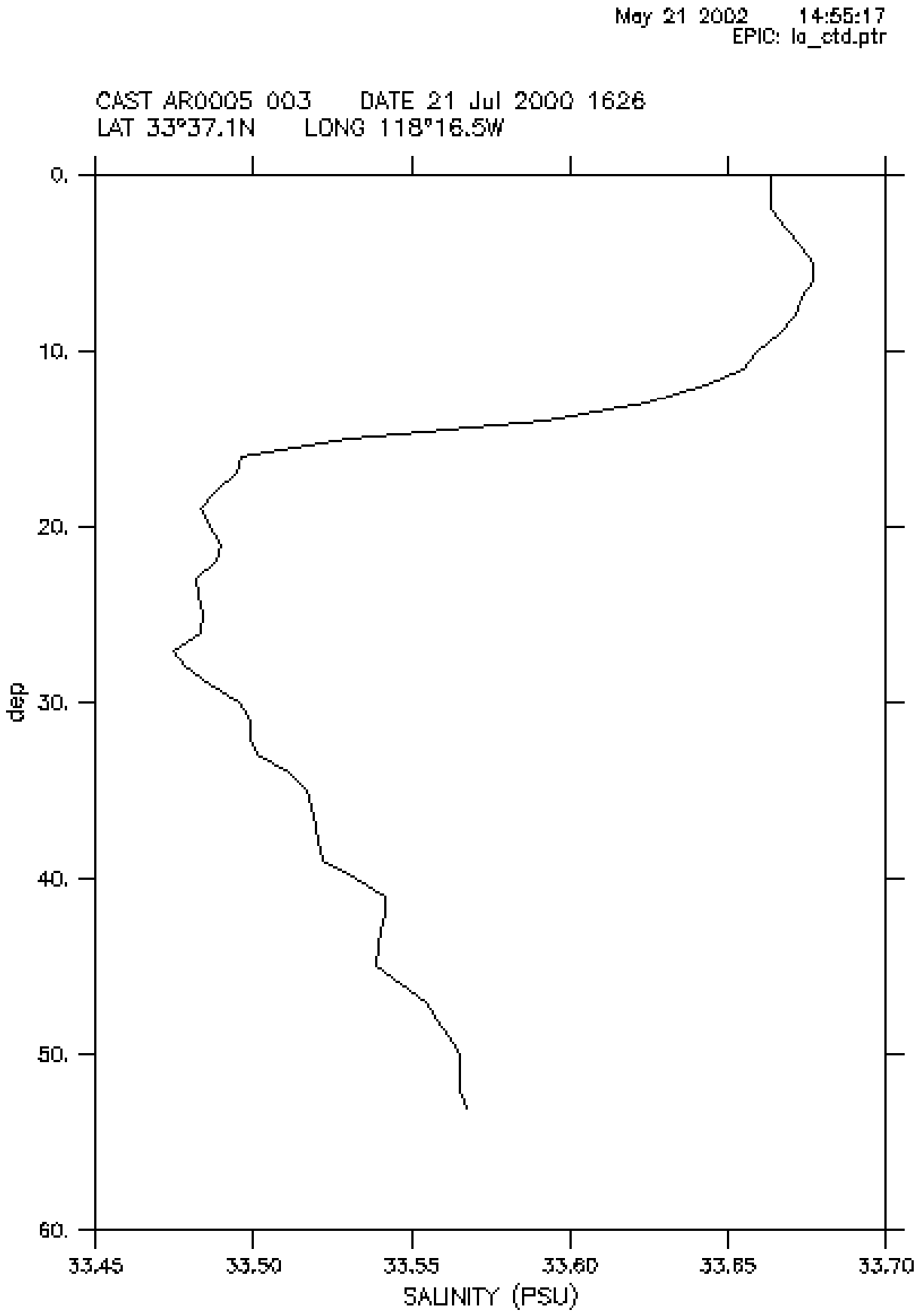
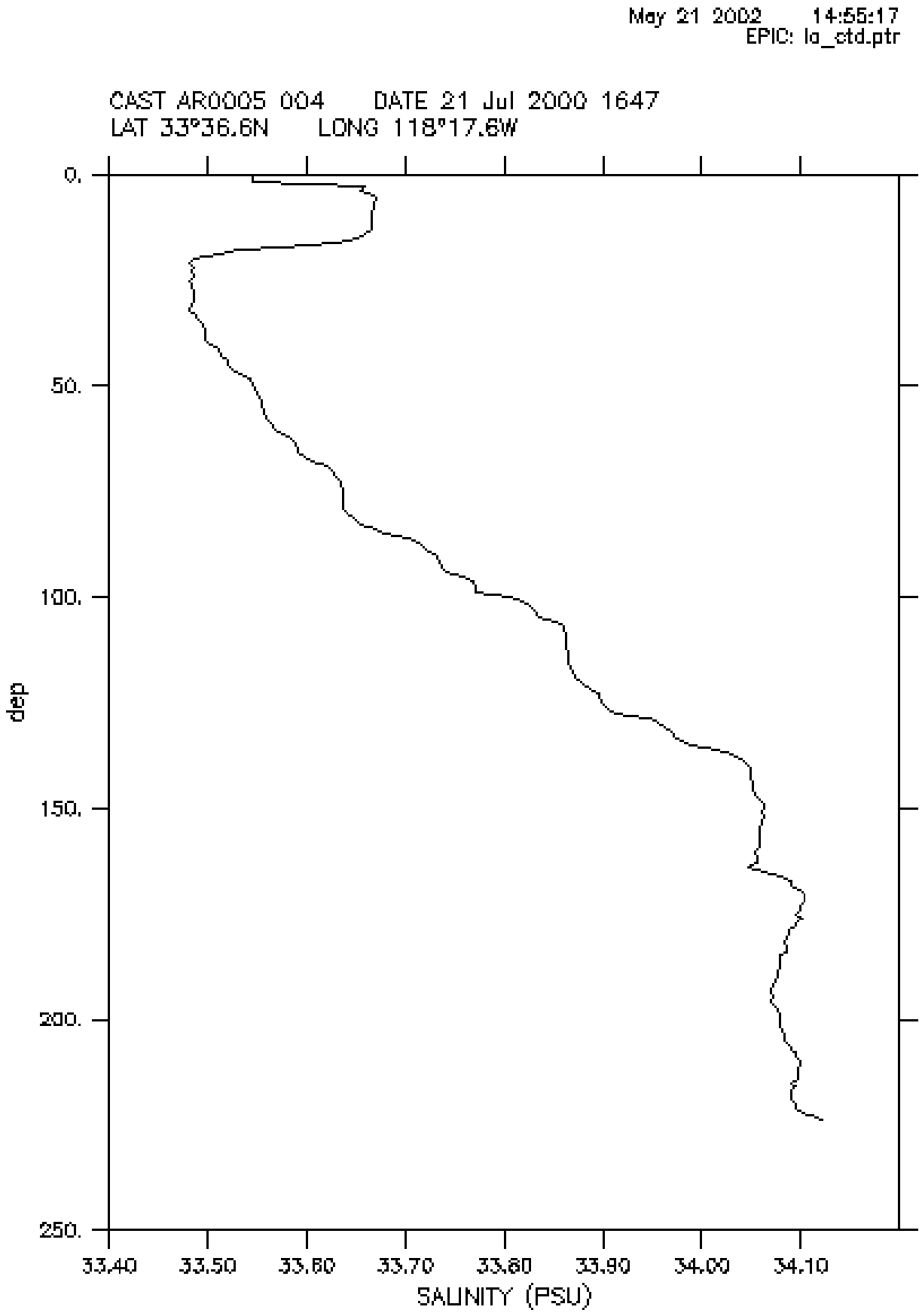
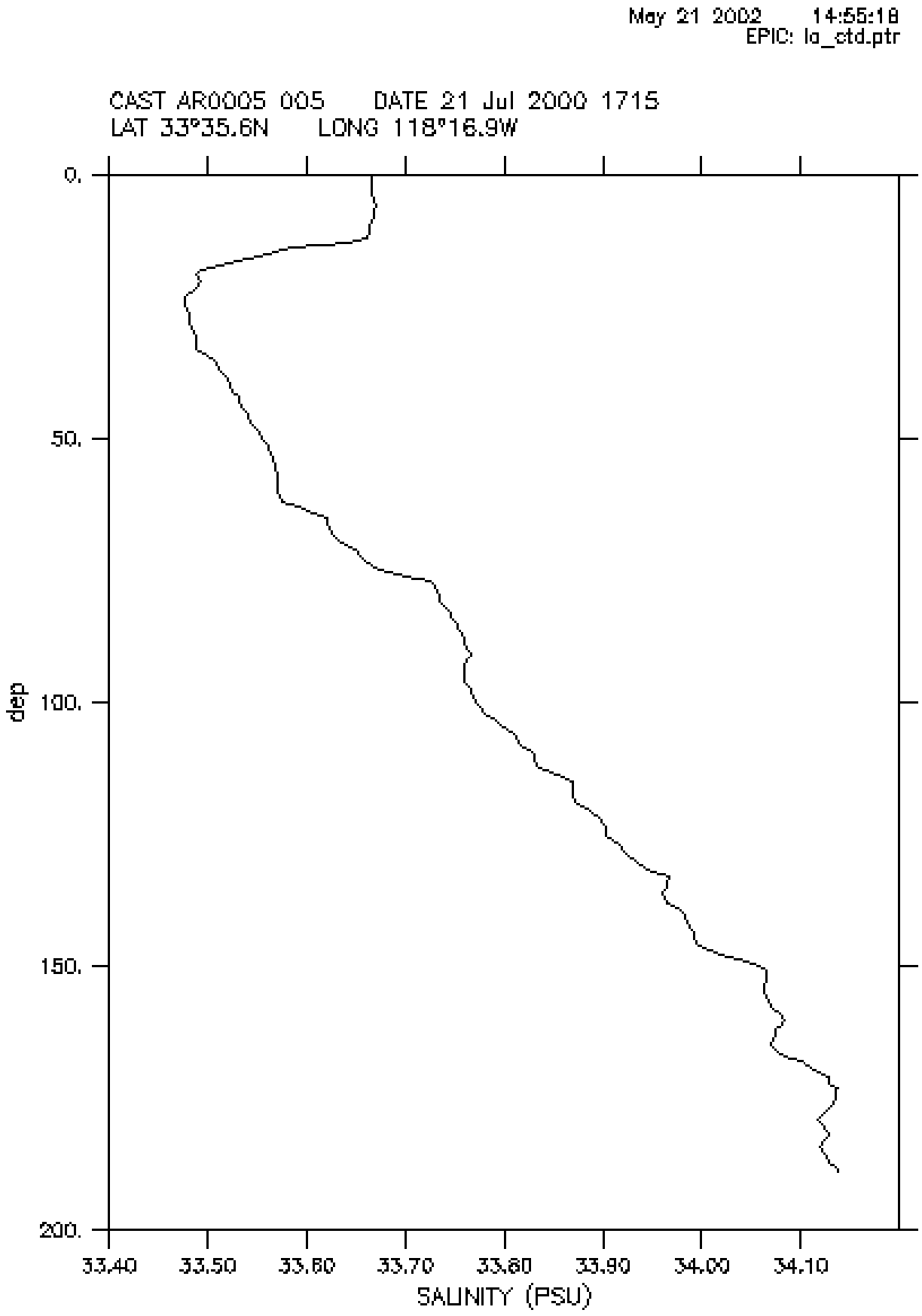
34.40
SALINITY (PSU)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 003 DATE 21 Jul 2000 1626
LAT 33°37.1N LONG 118°16.5W
0.
10.
20.
30.
40.
50.
60.
dep
33.45
33.50
33.55
33.60
33.65
33.70
SALINITY (PSU)


May 21 2002 14:55:17
EPIC: la_ctd.ptr
CAST AR0005 004 DATE 21 Jul 2000 1647
LAT 33°36.6N LONG 118°17.6W
0.
50.
100.
150.
200.
250.
dep
33.40
33.50
33.60
33.70
33.80
33.90
34.00
34.10
SALINITY (PSU)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EPIC: la_ctd.ptr
CAST AR0005 005 DATE 21 Jul 2000 1715
LAT 33°35.6N LONG 118°16.9W
0.
50.
100.
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200.
dep
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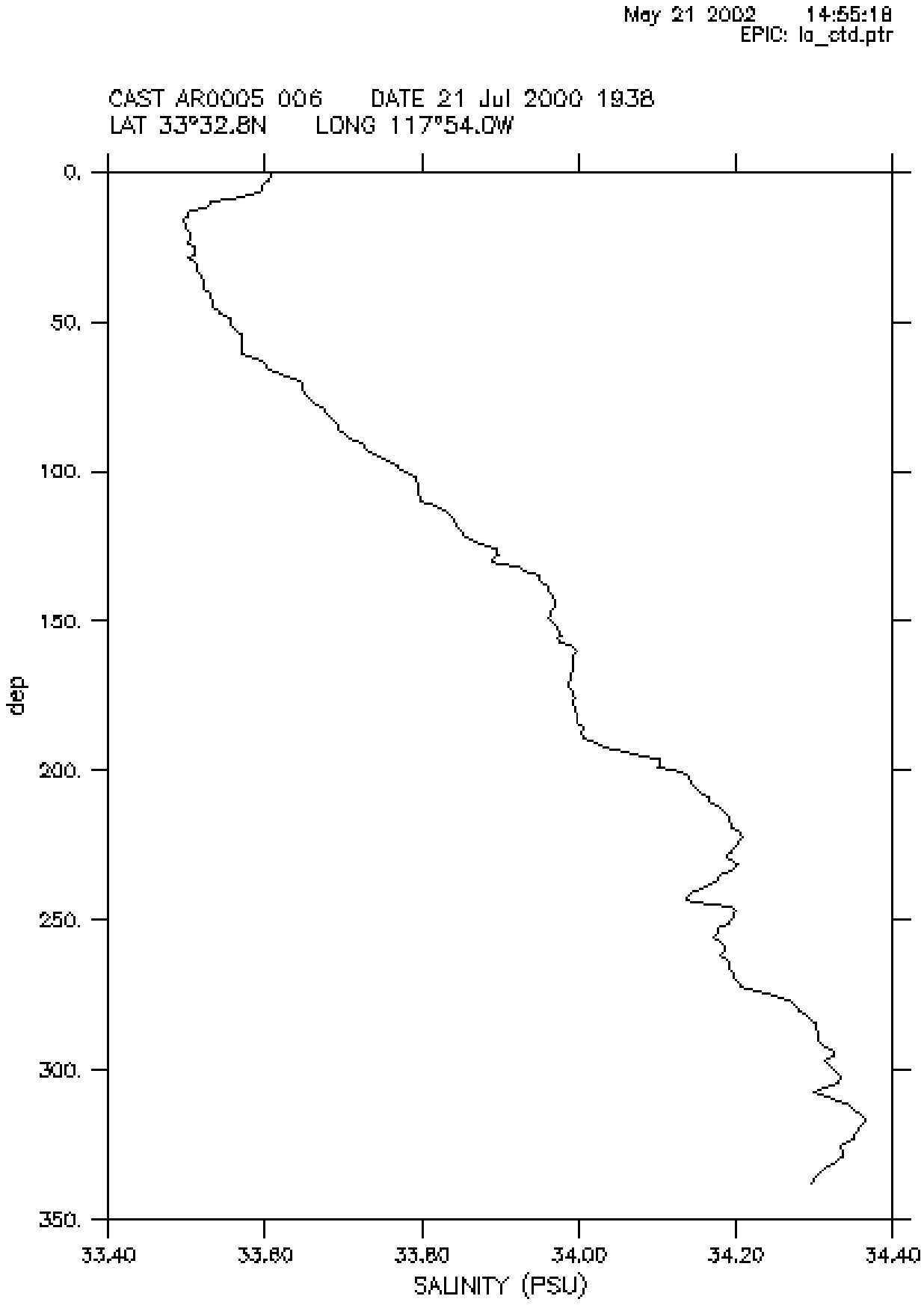
33.50
33.60
33.70
33.80
33.90
34.00
34.10
SALINITY (PSU)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100.
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350.
dep
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34.00
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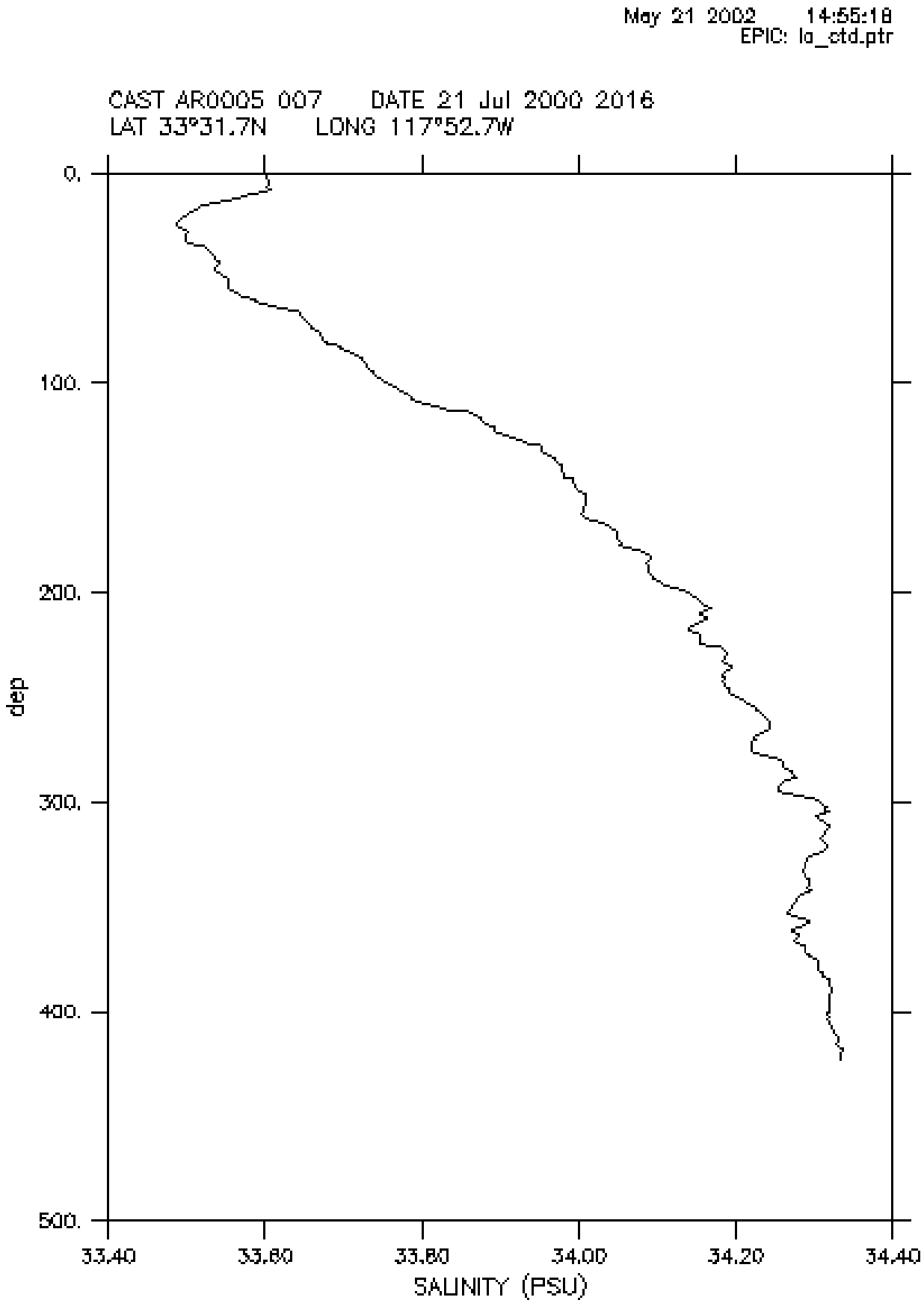
SALINITY (PSU)


May 21 2002 14:55:18
EPIC: la_ctd.ptr
CAST AR0005 007 DATE 21 Jul 2000 2016
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dep
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33.80
34.00
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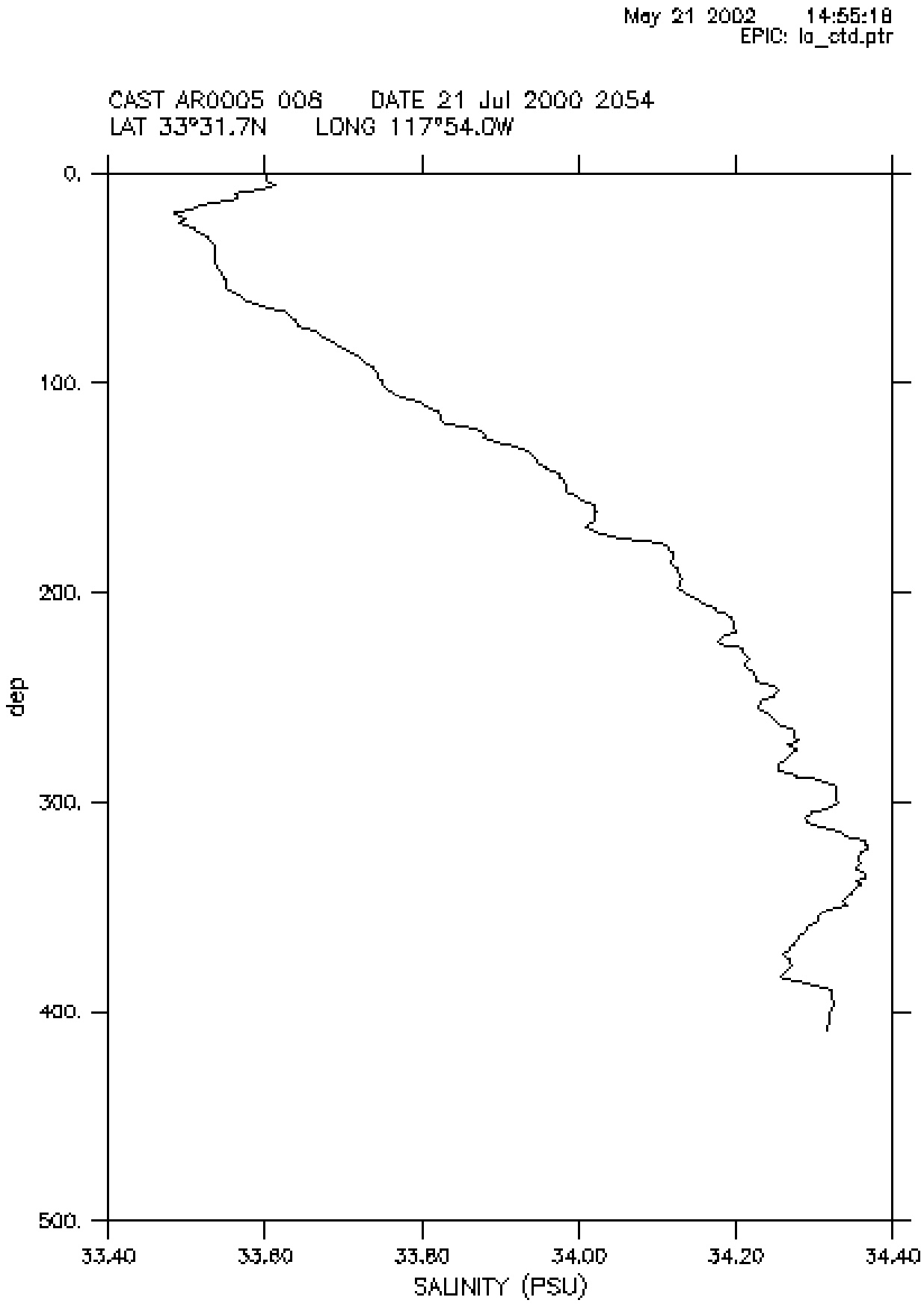
34.40
SALINITY (PSU)


May 21 2002 14:55:18
EPIC: la_ctd.ptr
CAST AR0005 008 DATE 21 Jul 2000 2054
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0.
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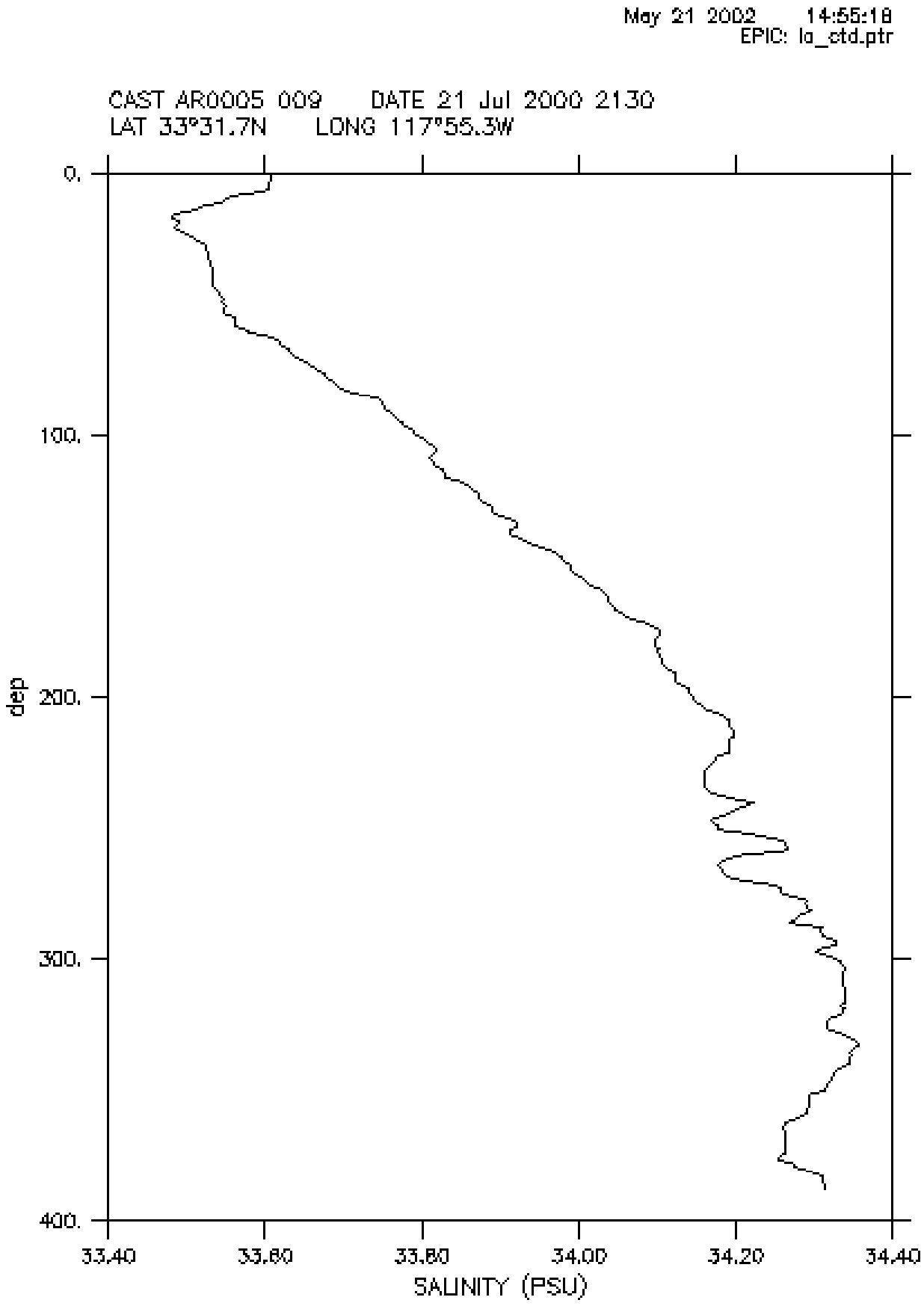
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


May 21 2002 14:55:18
EPIC: la_ctd.ptr
CAST AR0005 009 DATE 21 Jul 2000 2130
LAT 33°31.7N LONG 117°55.3W
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200.
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400.
dep
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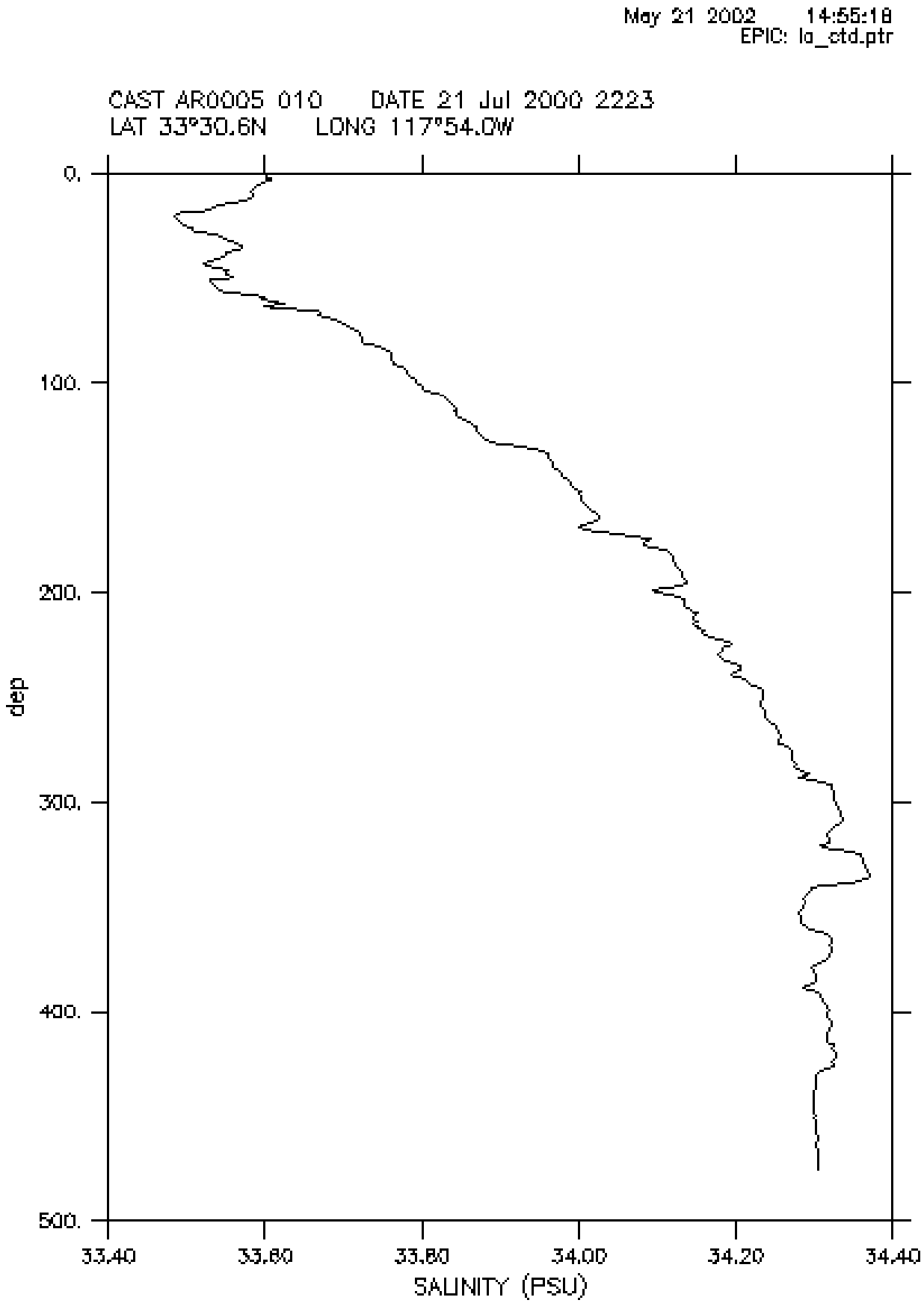
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


May 21 2002 14:55:18
EPIC: la_ctd.ptr
CAST AR0005 010 DATE 21 Jul 2000 2223
LAT 33°30.6N LONG 117°54.0W
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500.
dep
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33.60
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34.00
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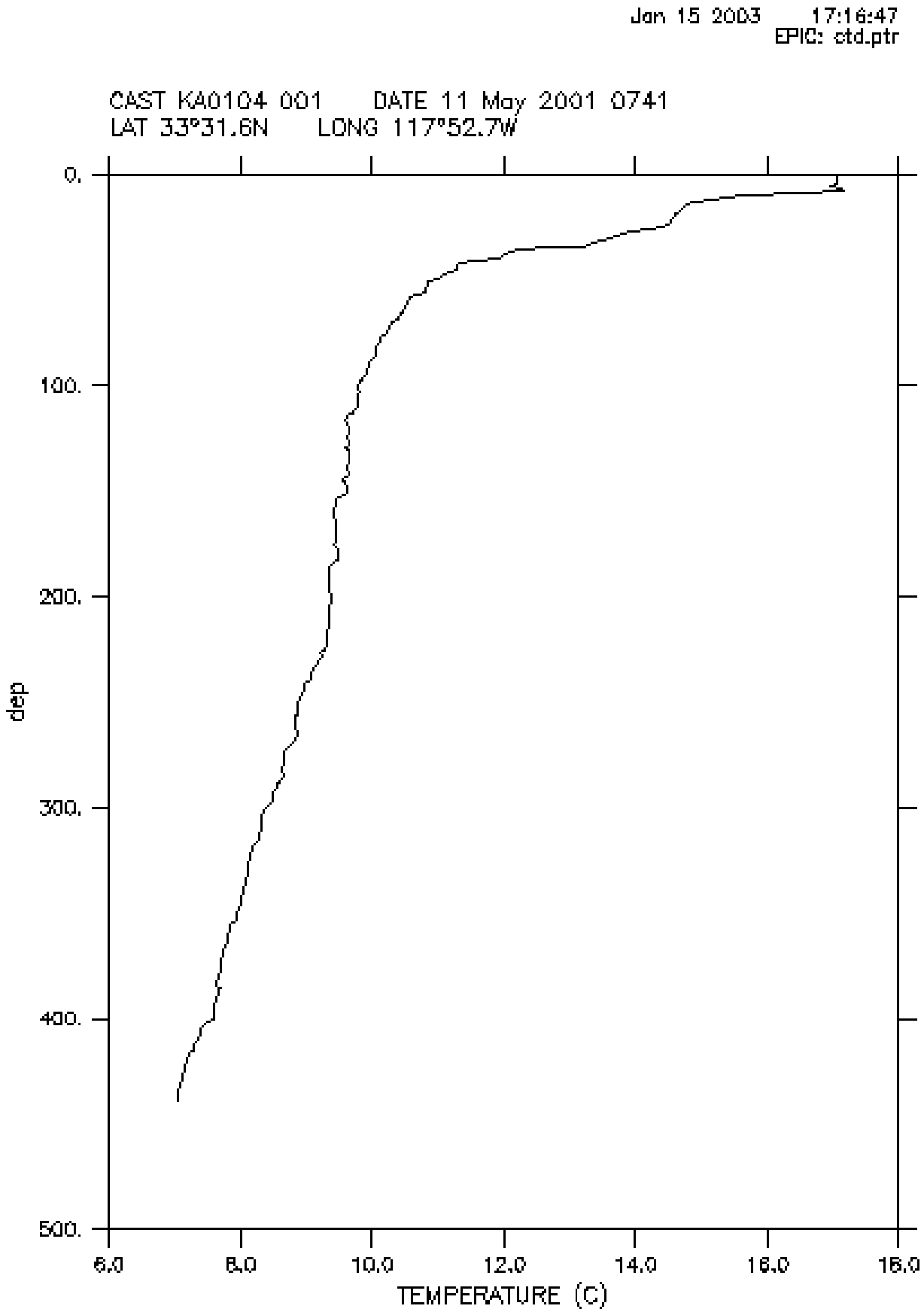
SALINITY (PSU)


Jan 15 2003 17:16:47
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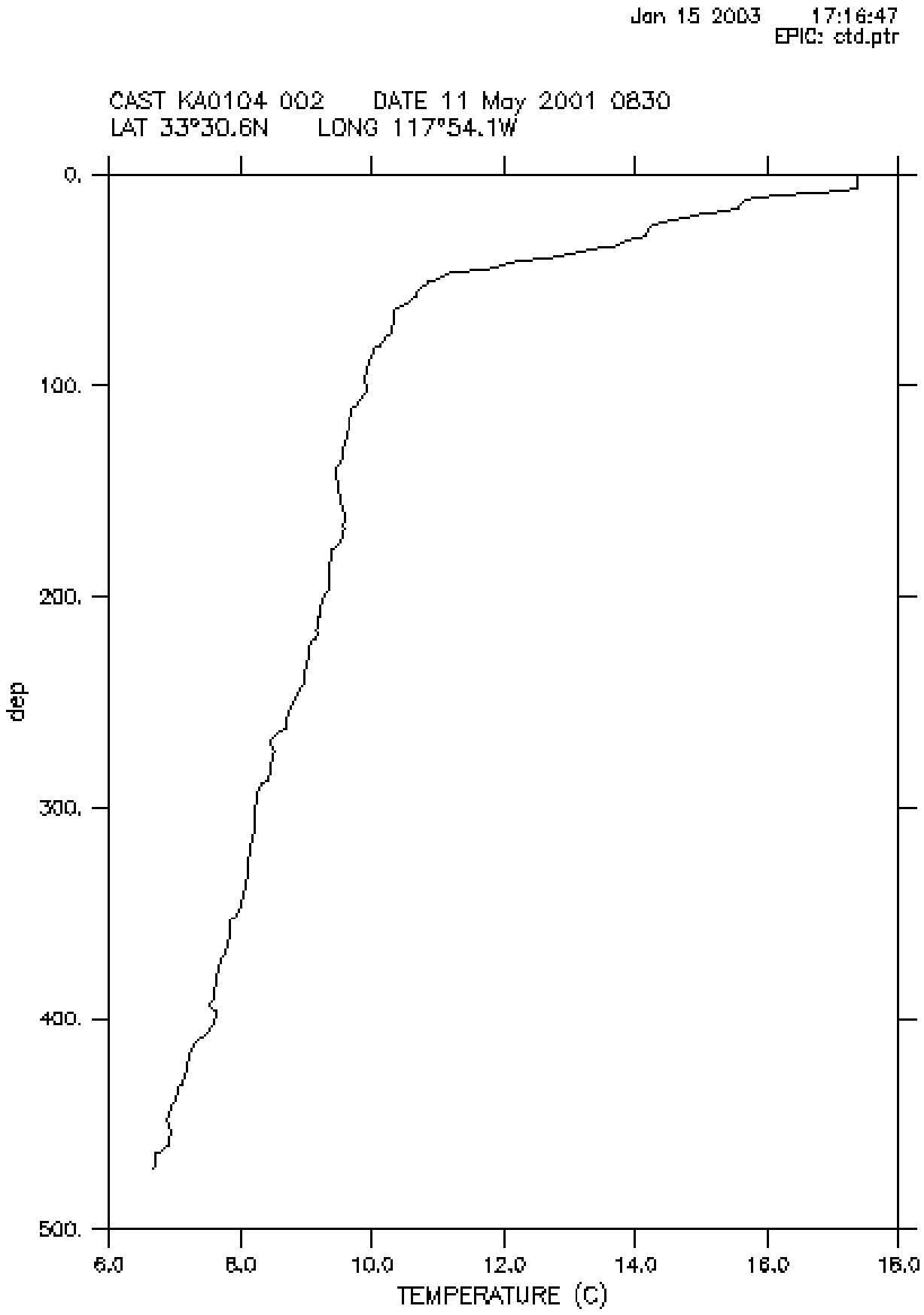
TEMPERATURE (C)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100.
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500.
dep
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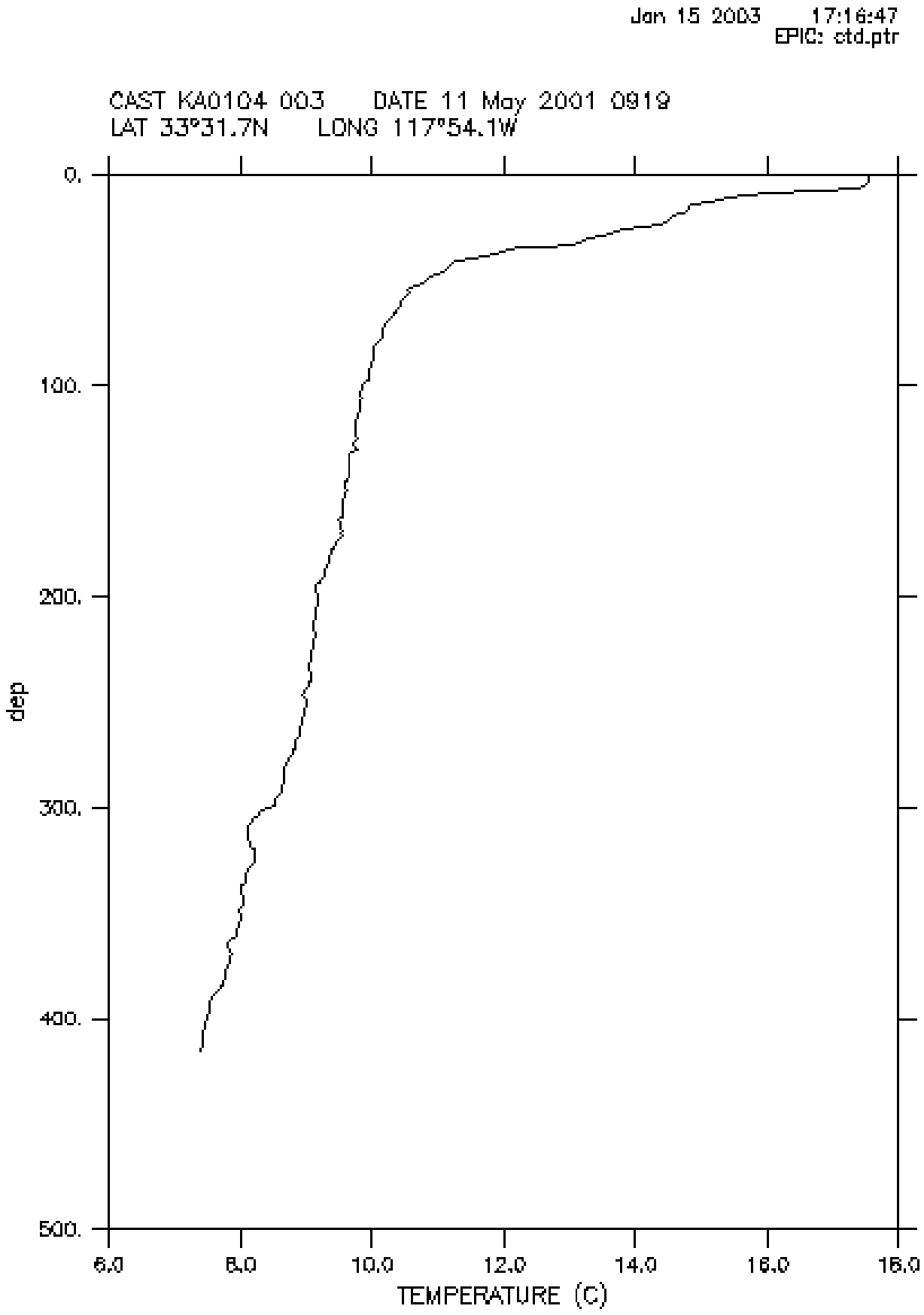
TEMPERATURE (C)


Jan 15 2003 17:16:47
EPIC: ctd.ptr
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500.
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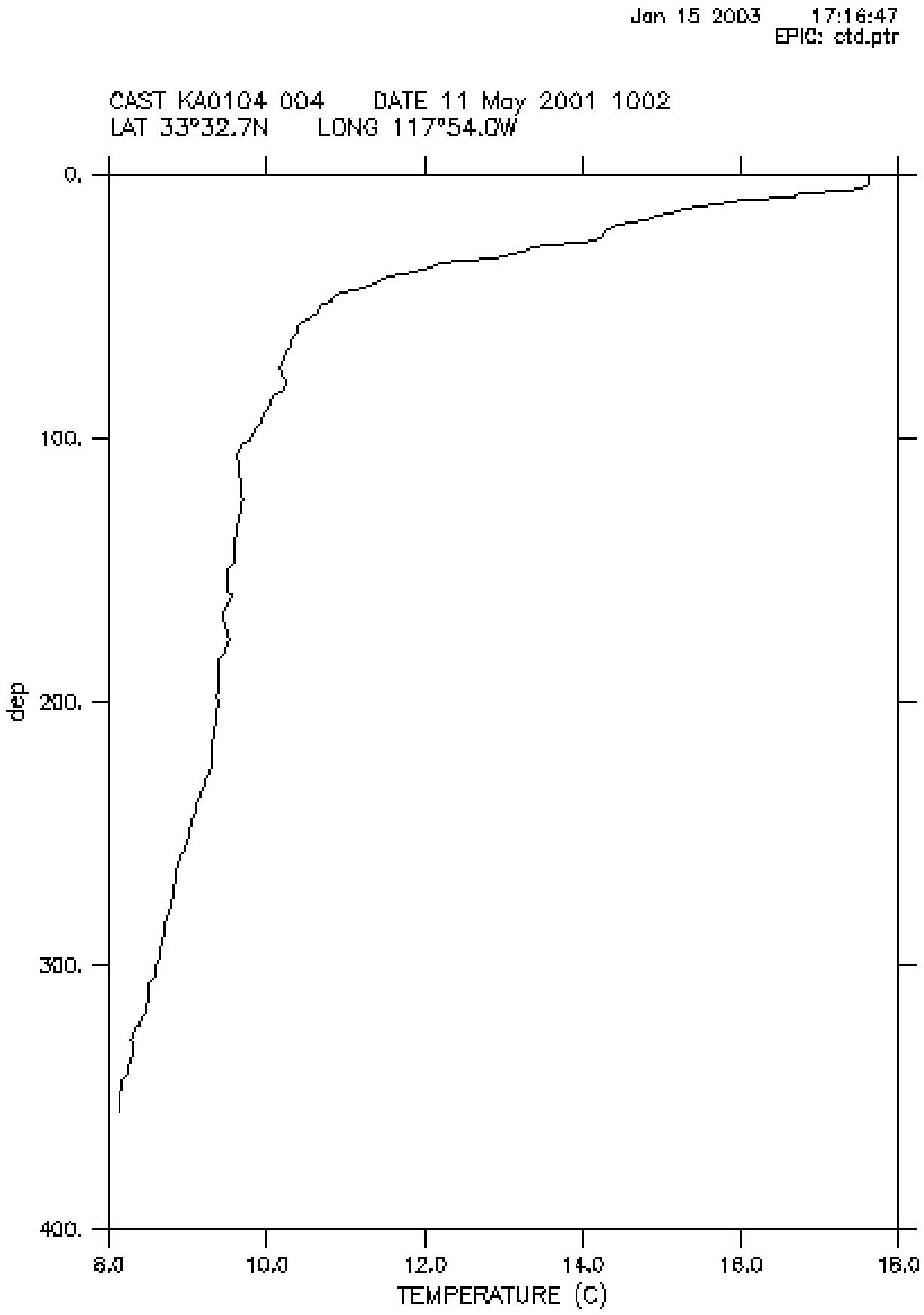
TEMPERATURE (C)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EPIC: ctd.ptr
CAST KA0104 004 DATE 11 May 2001 1002
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300.
400.
dep
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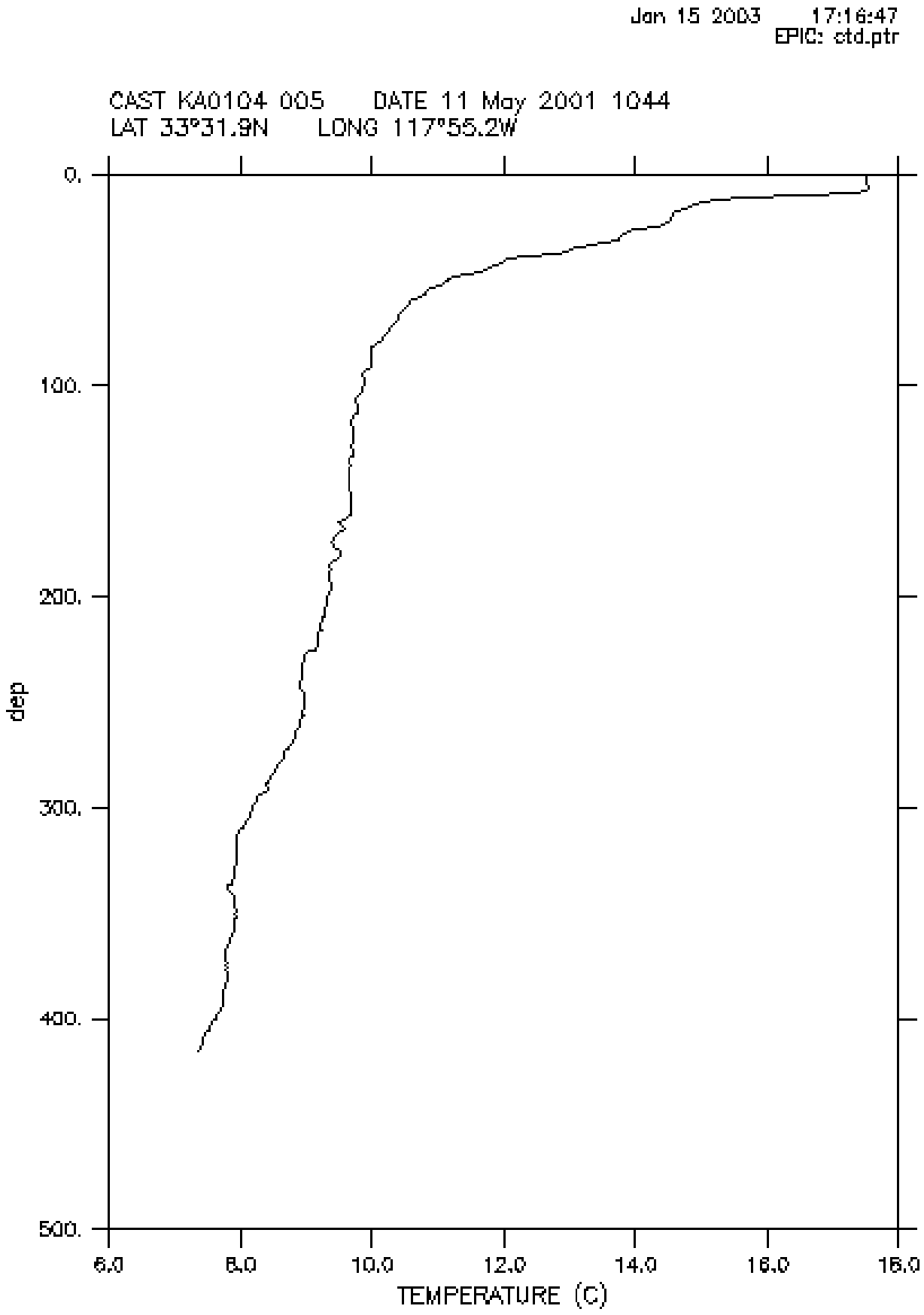
14.0
16.0
18.0
TEMPERATURE (C)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CAST KA0104 005 DATE 11 May 2001 1044
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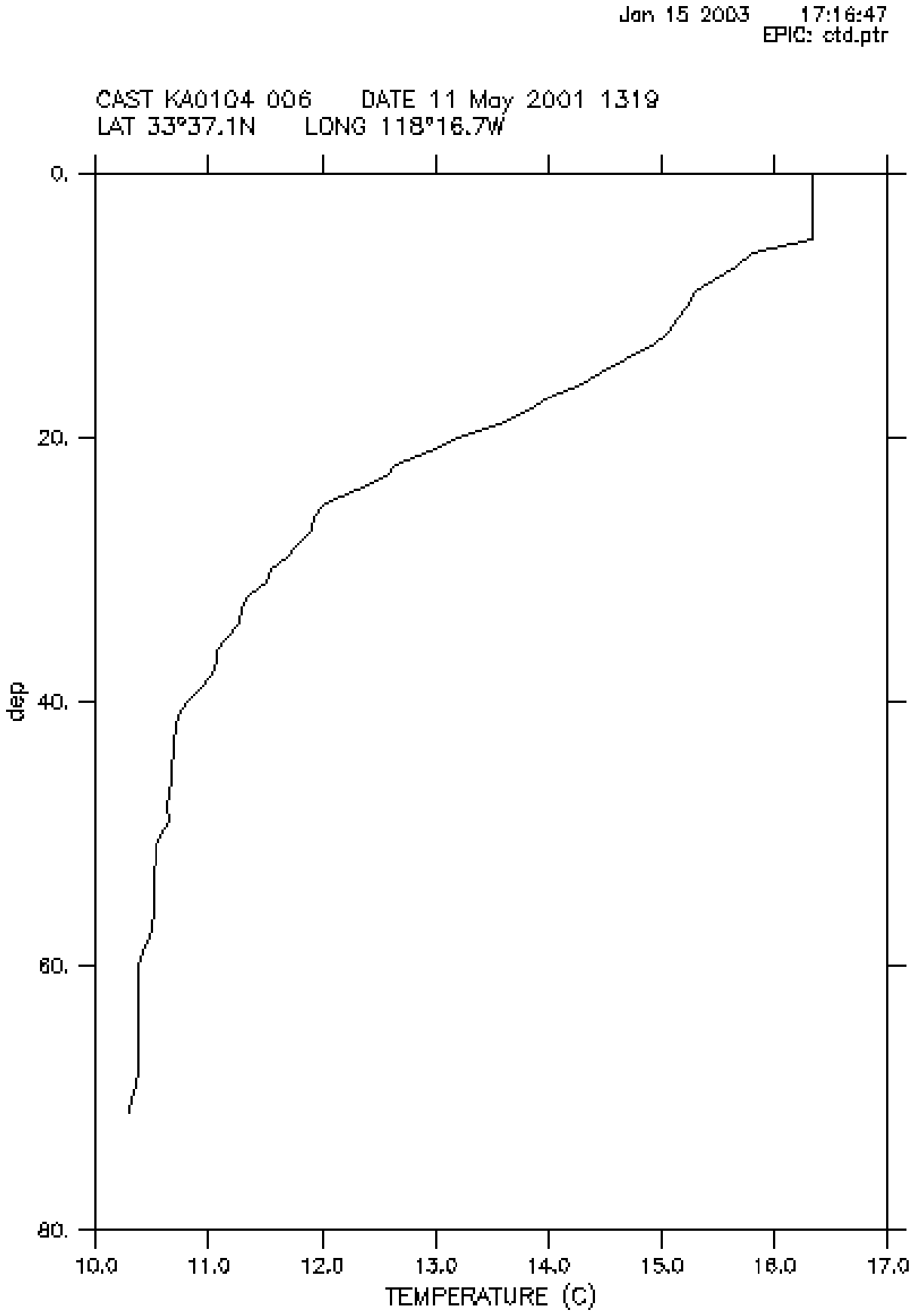
TEMPERATURE (C)


Jan 15 2003 17:16:47
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dep
10.0
11.0
12.0
13.0
14.0
15.0
16.0
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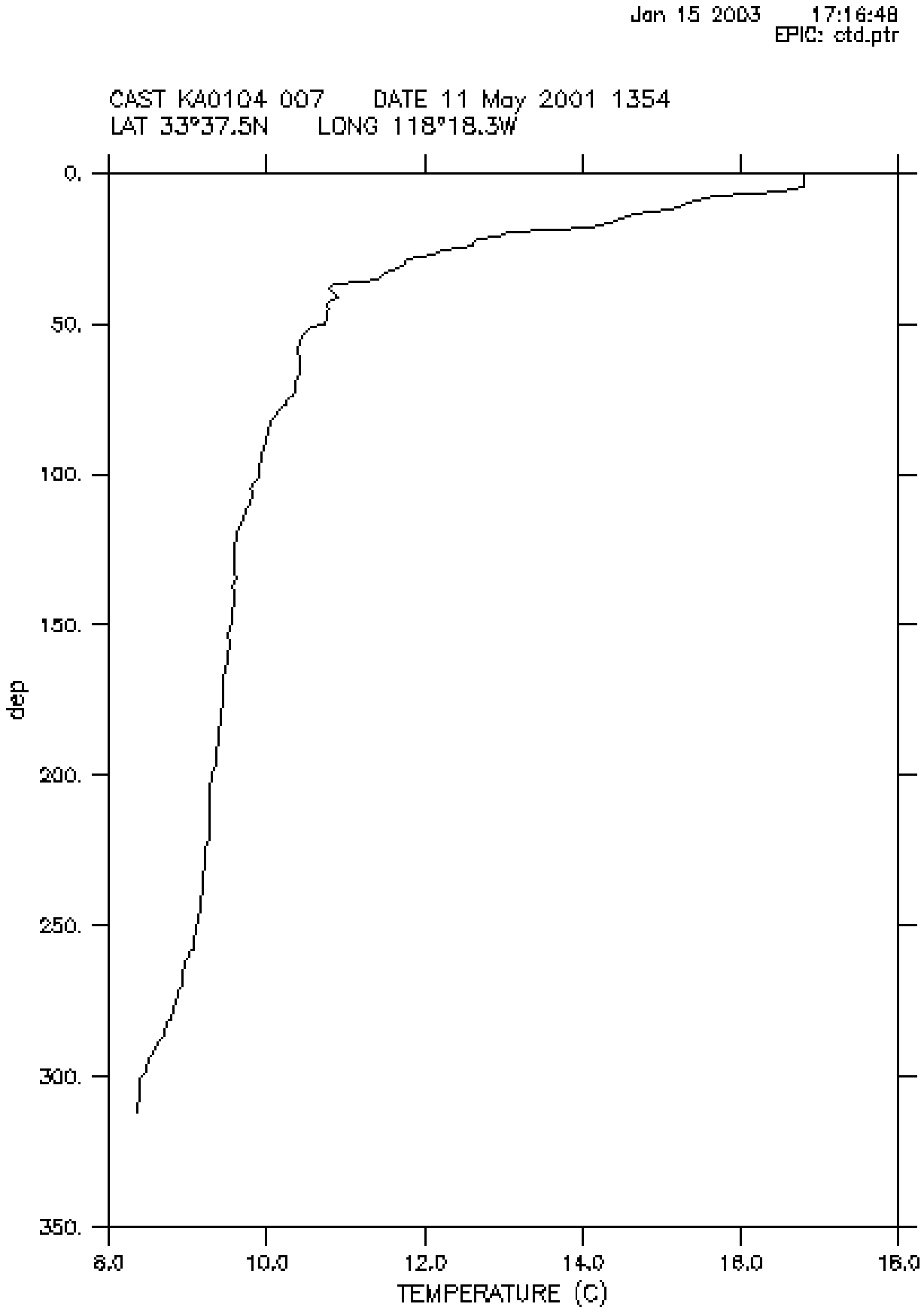
TEMPERATURE (C)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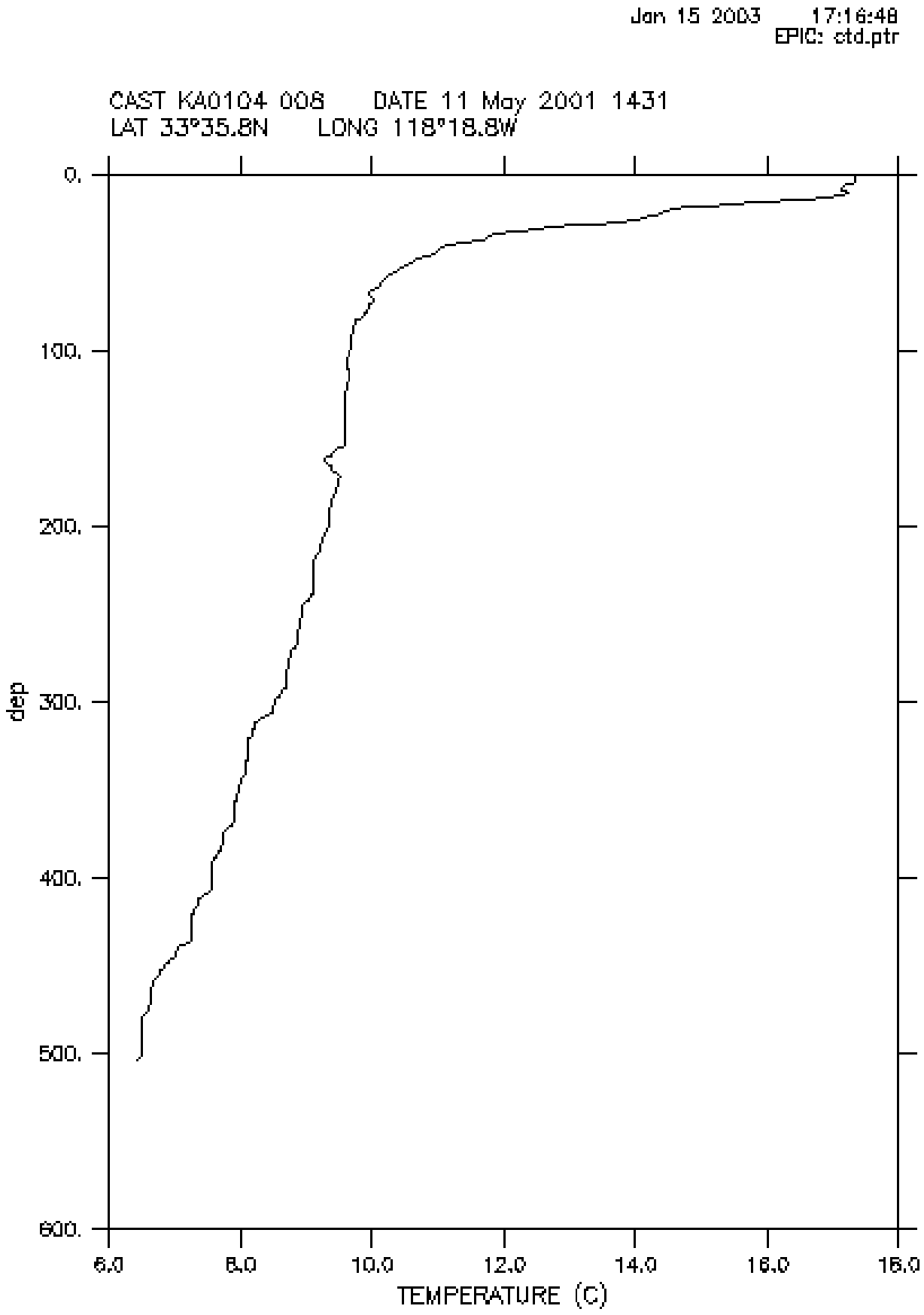
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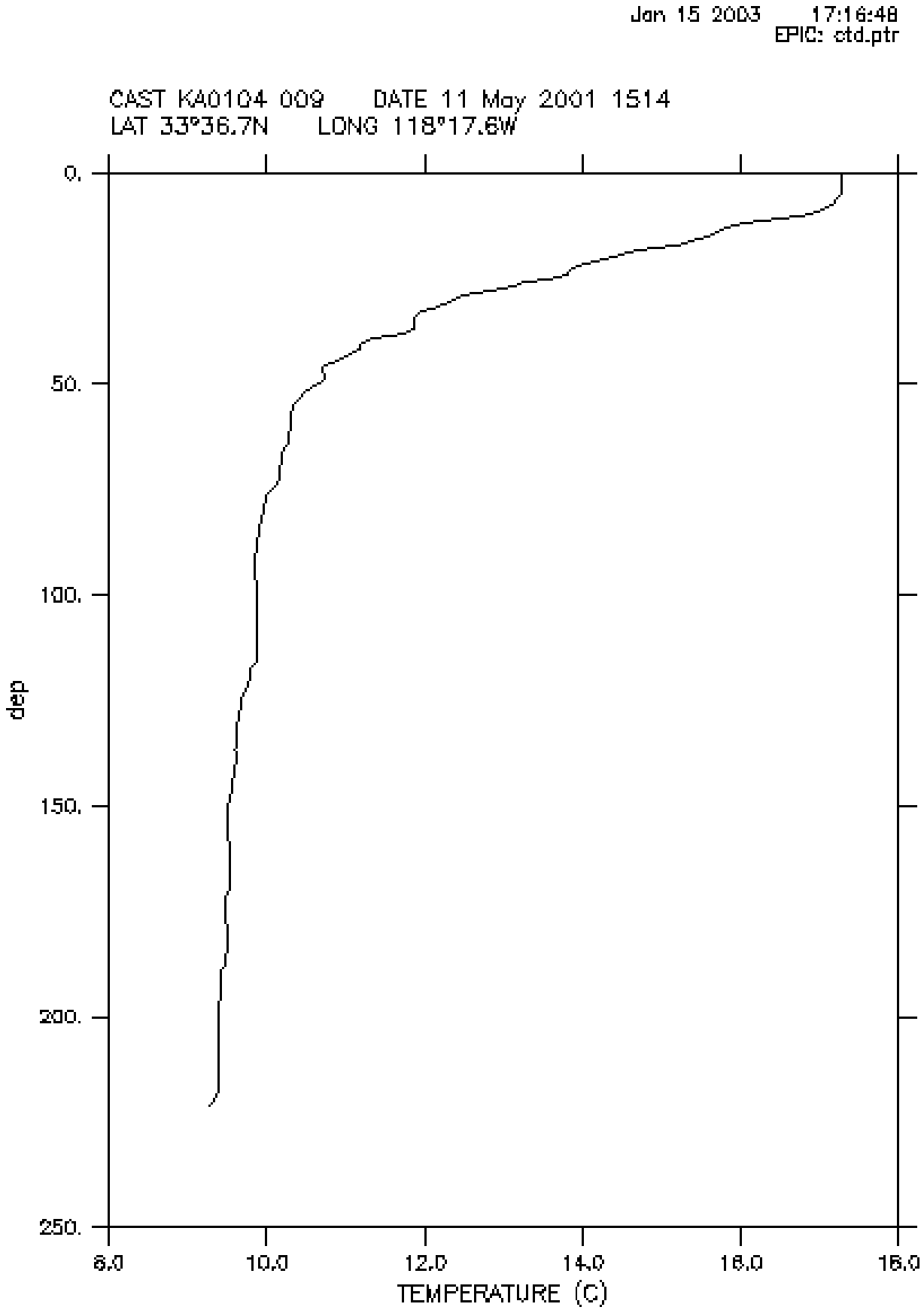
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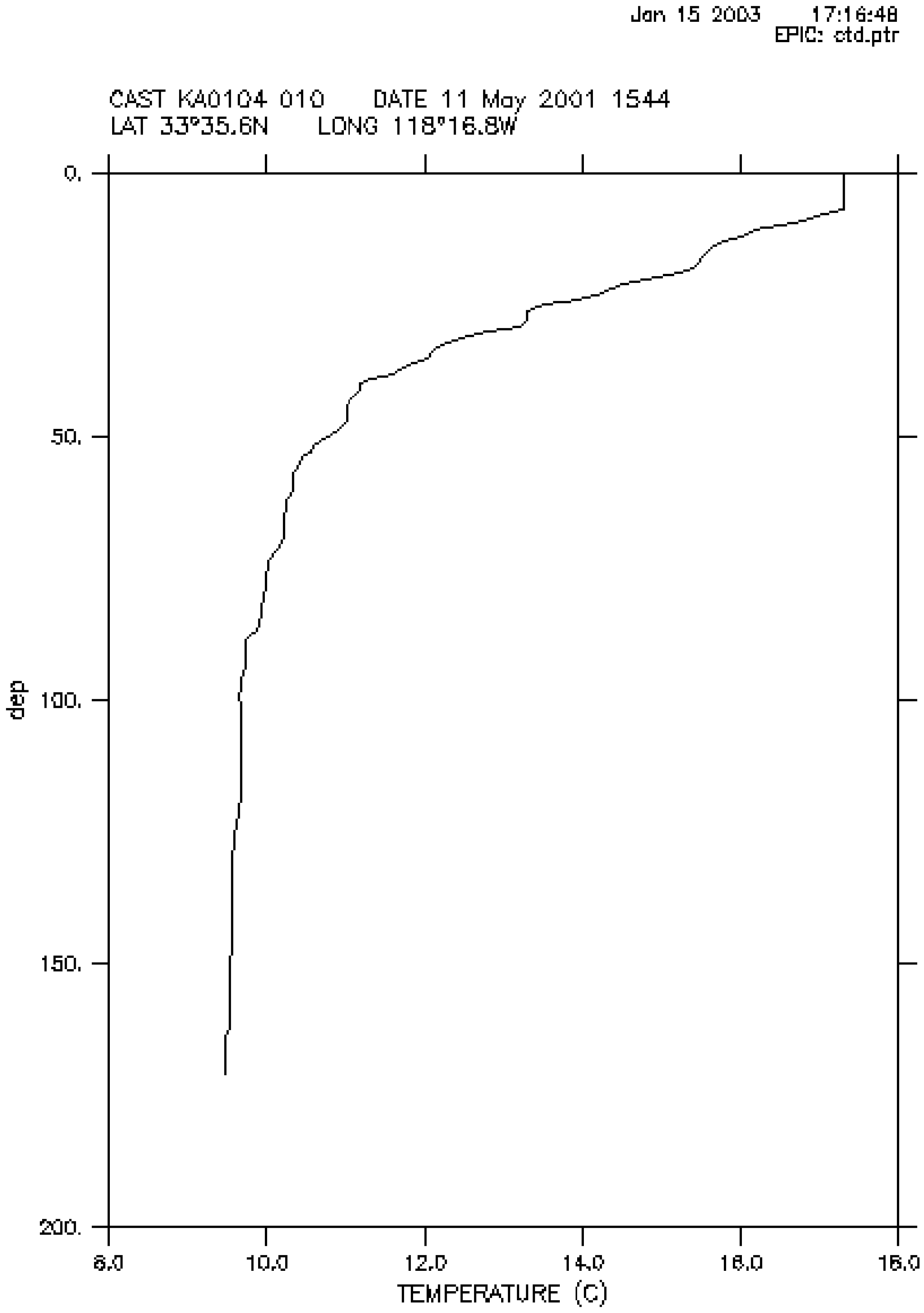
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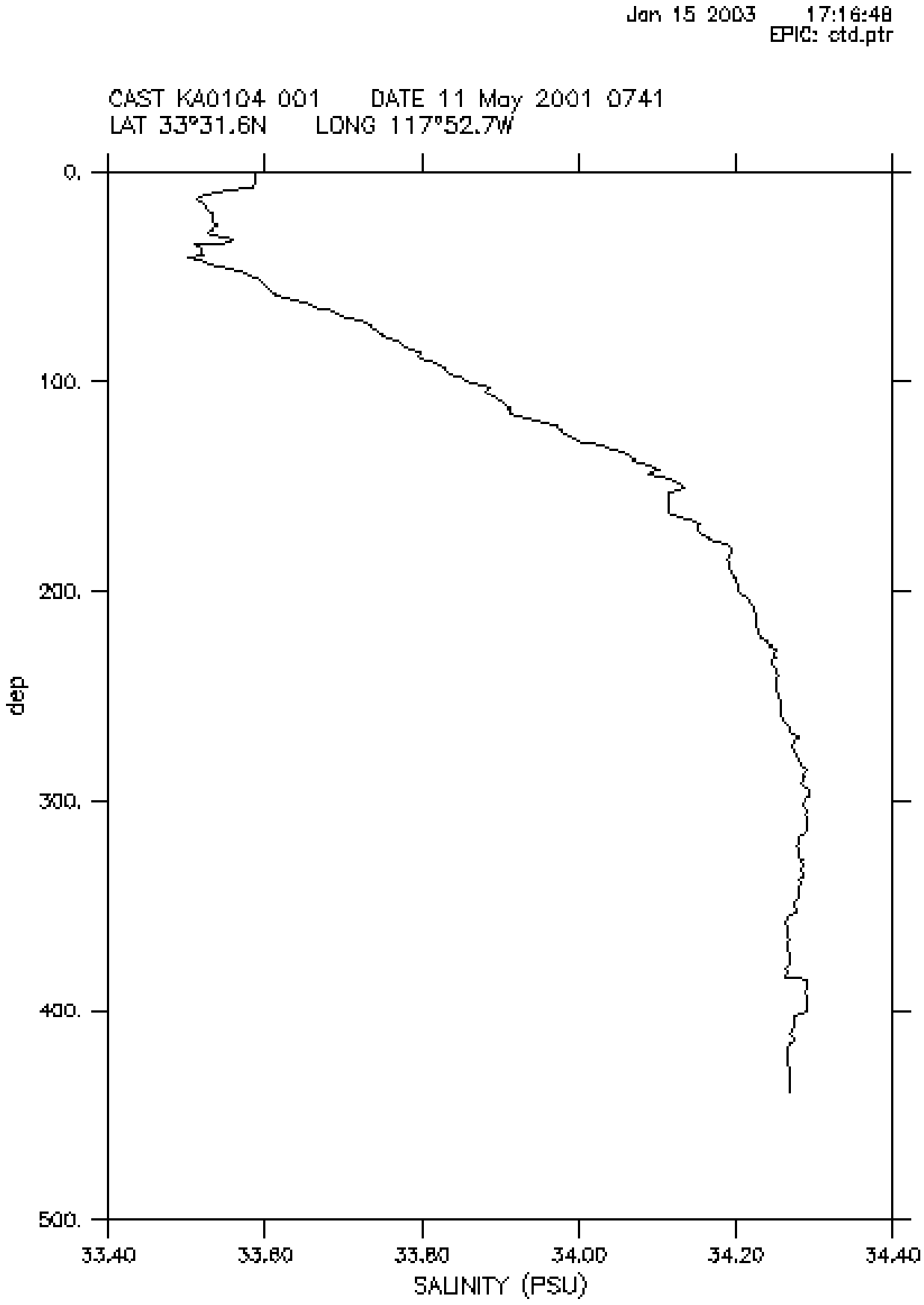
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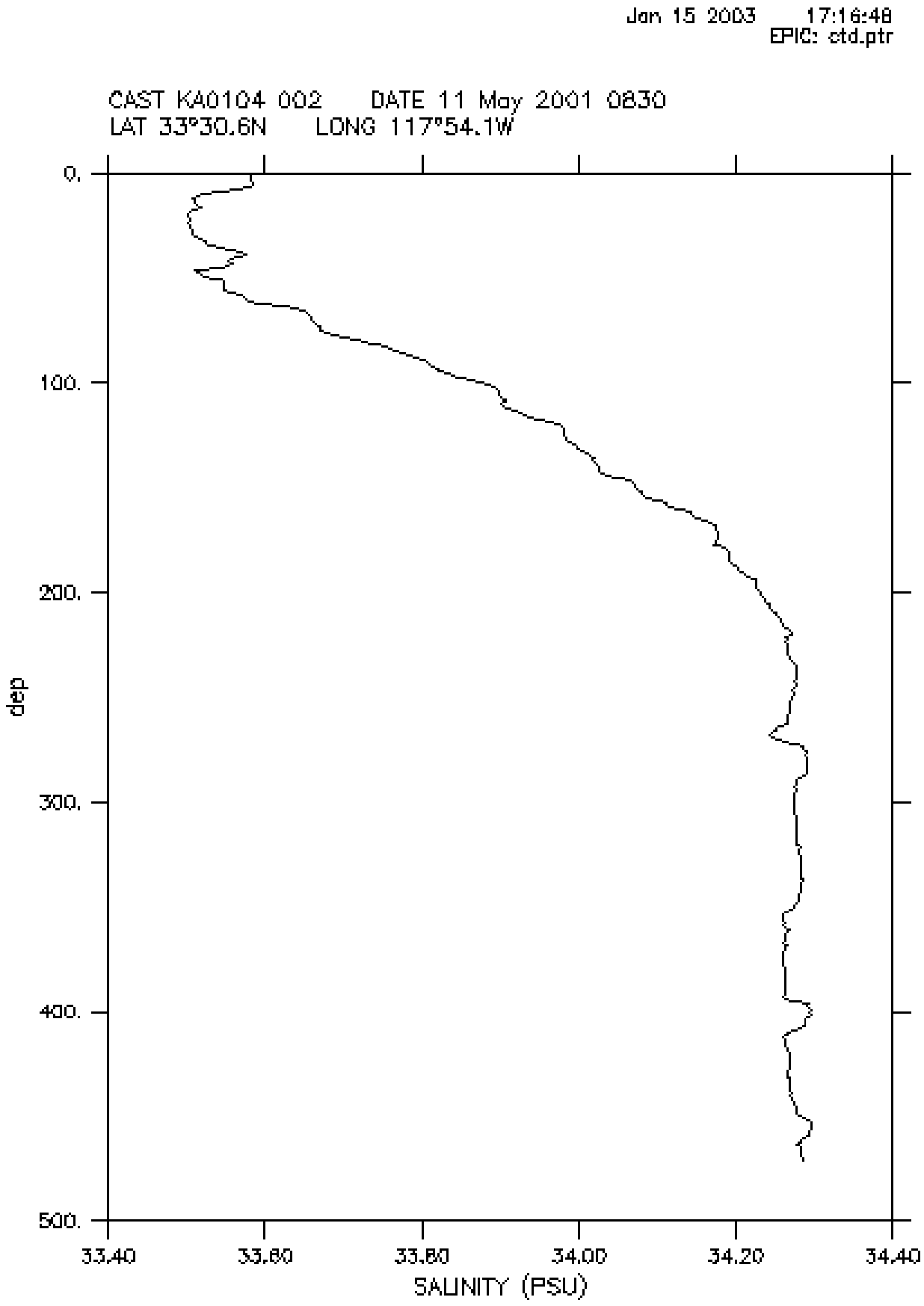
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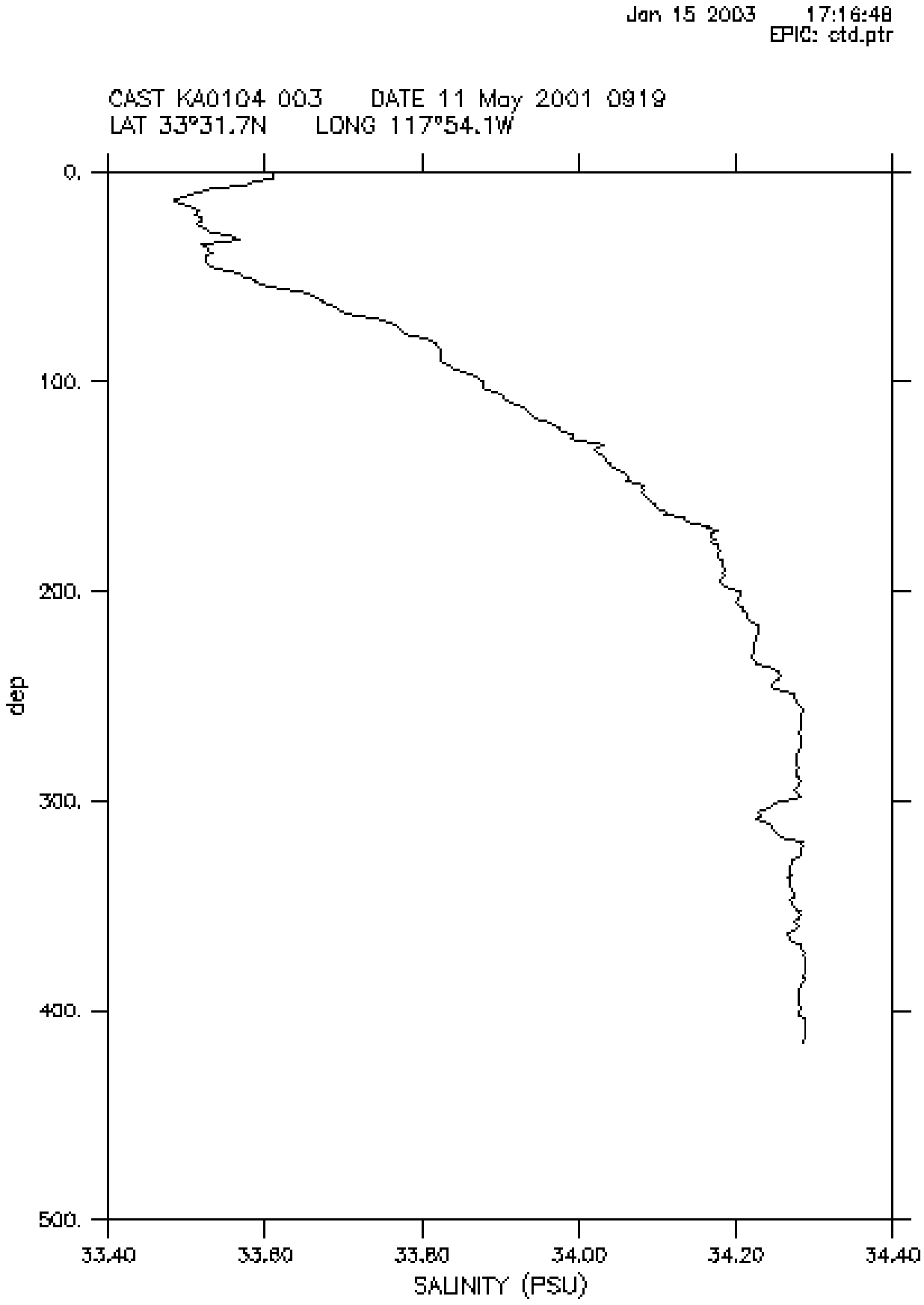
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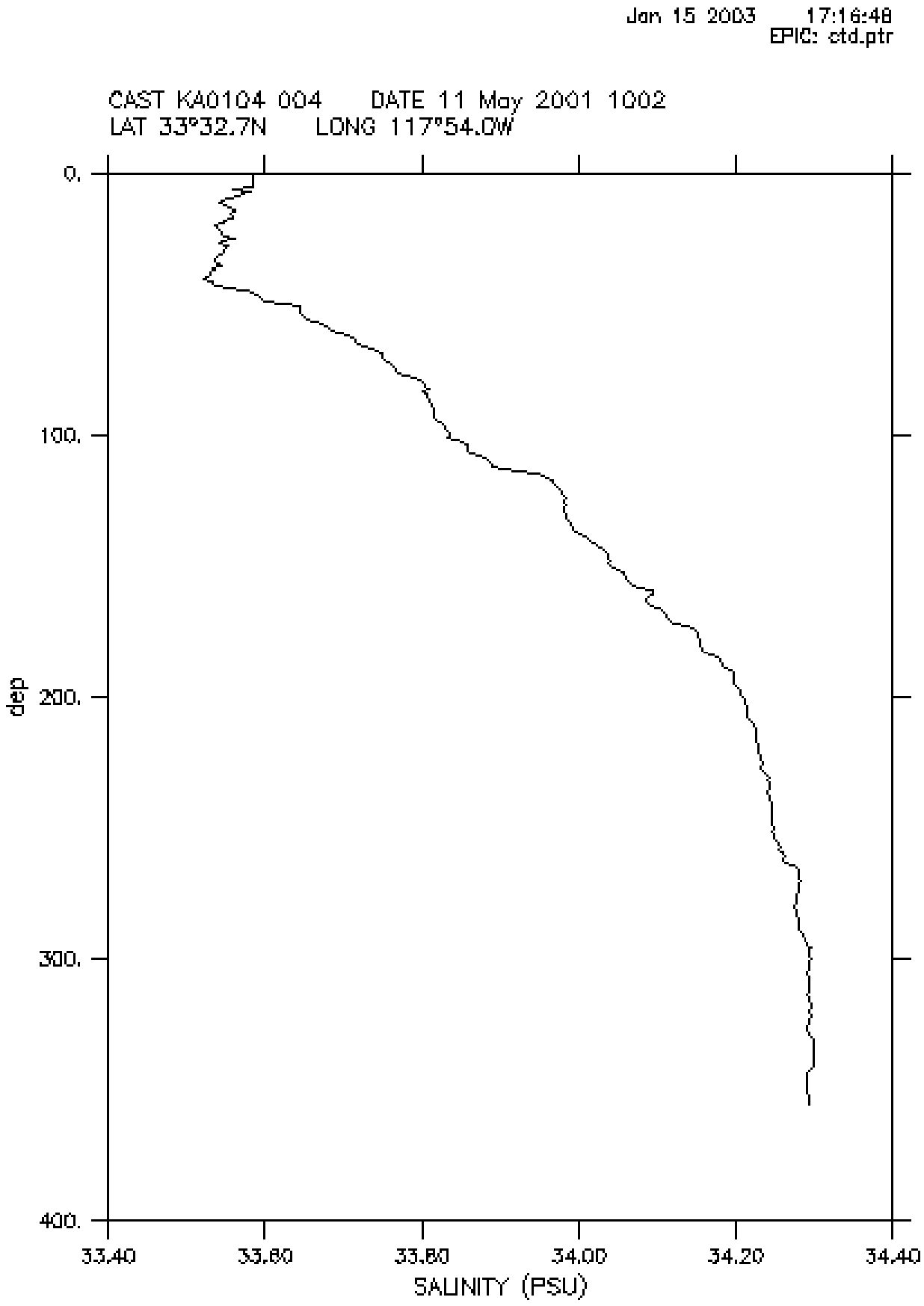
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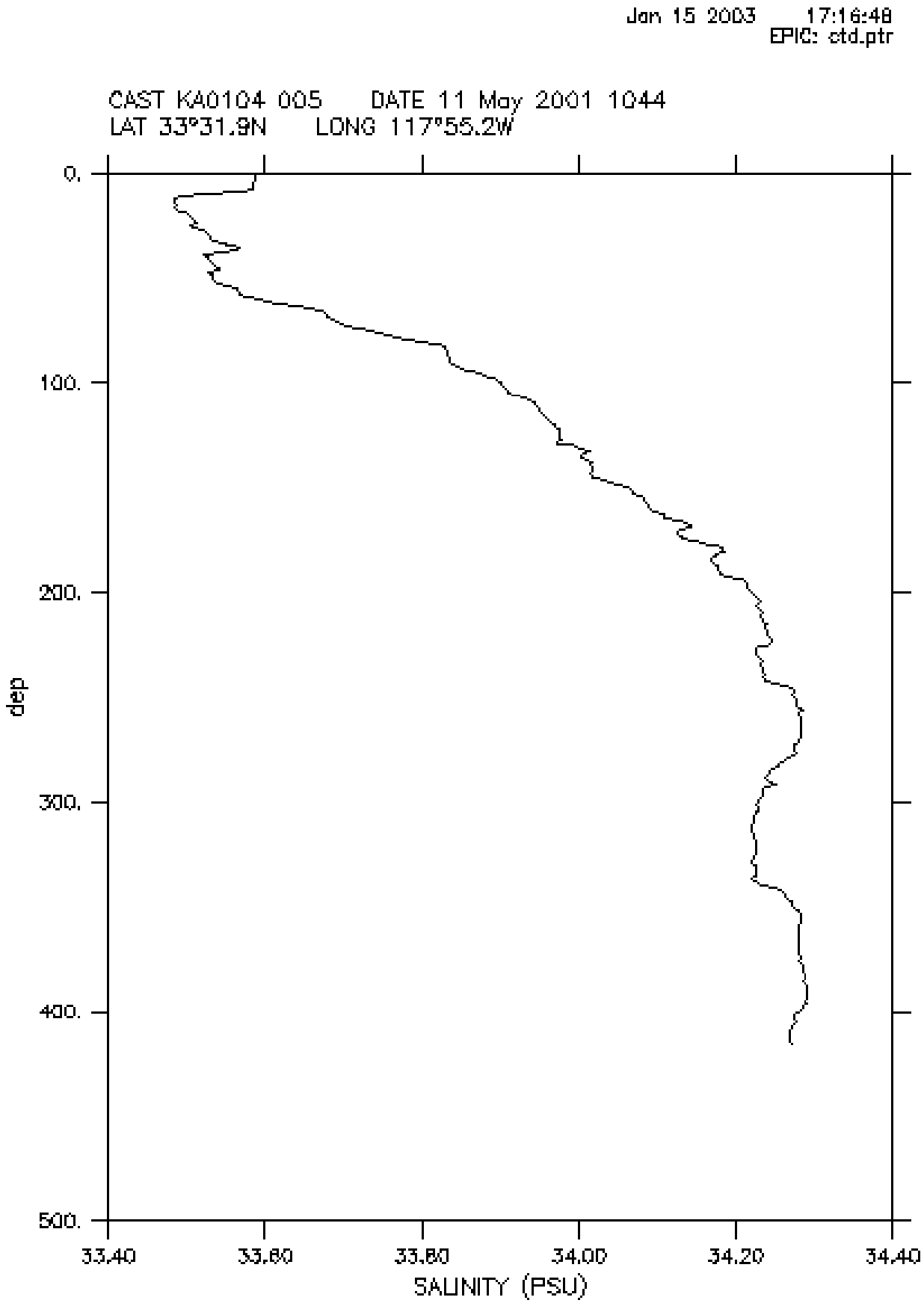
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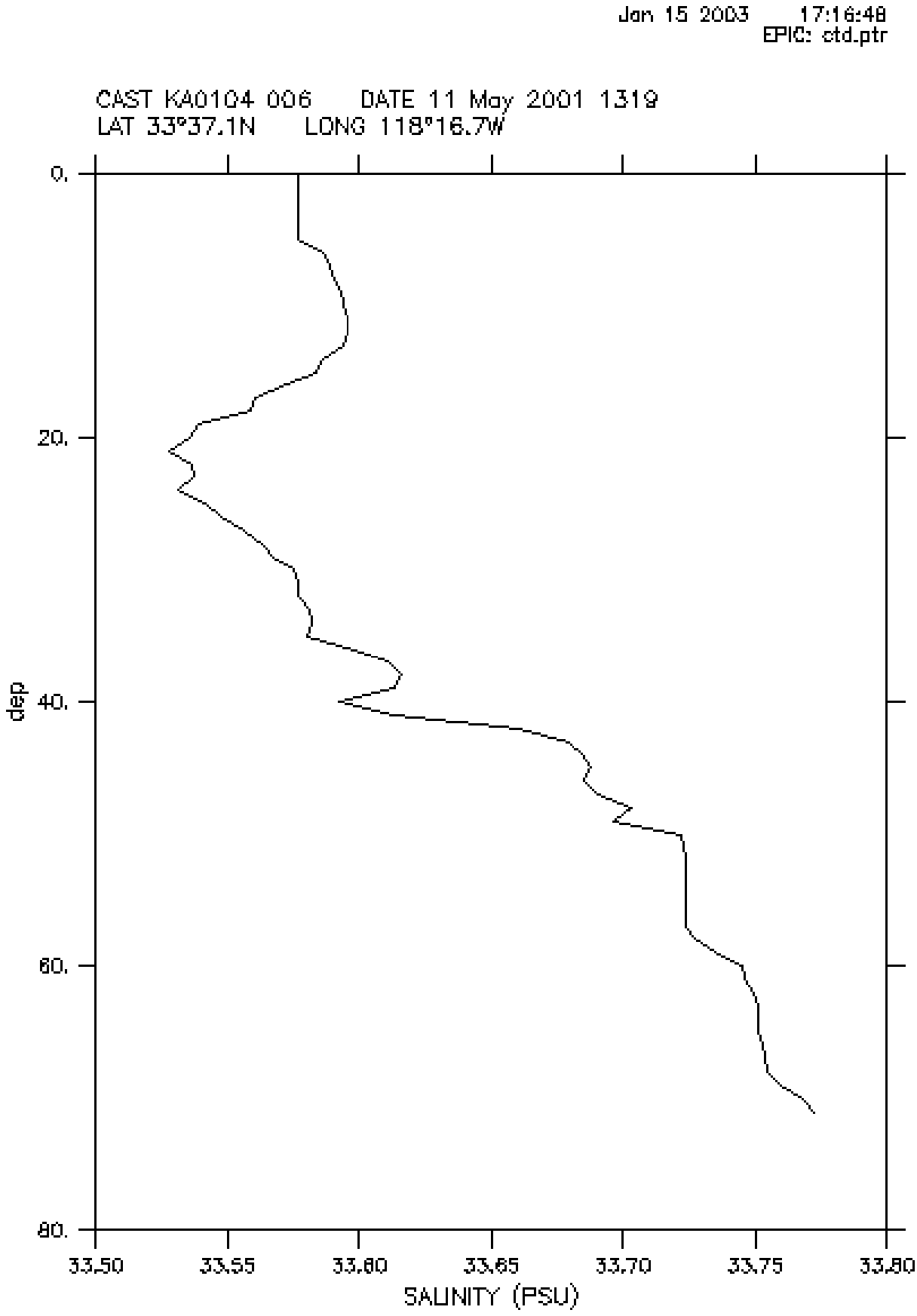
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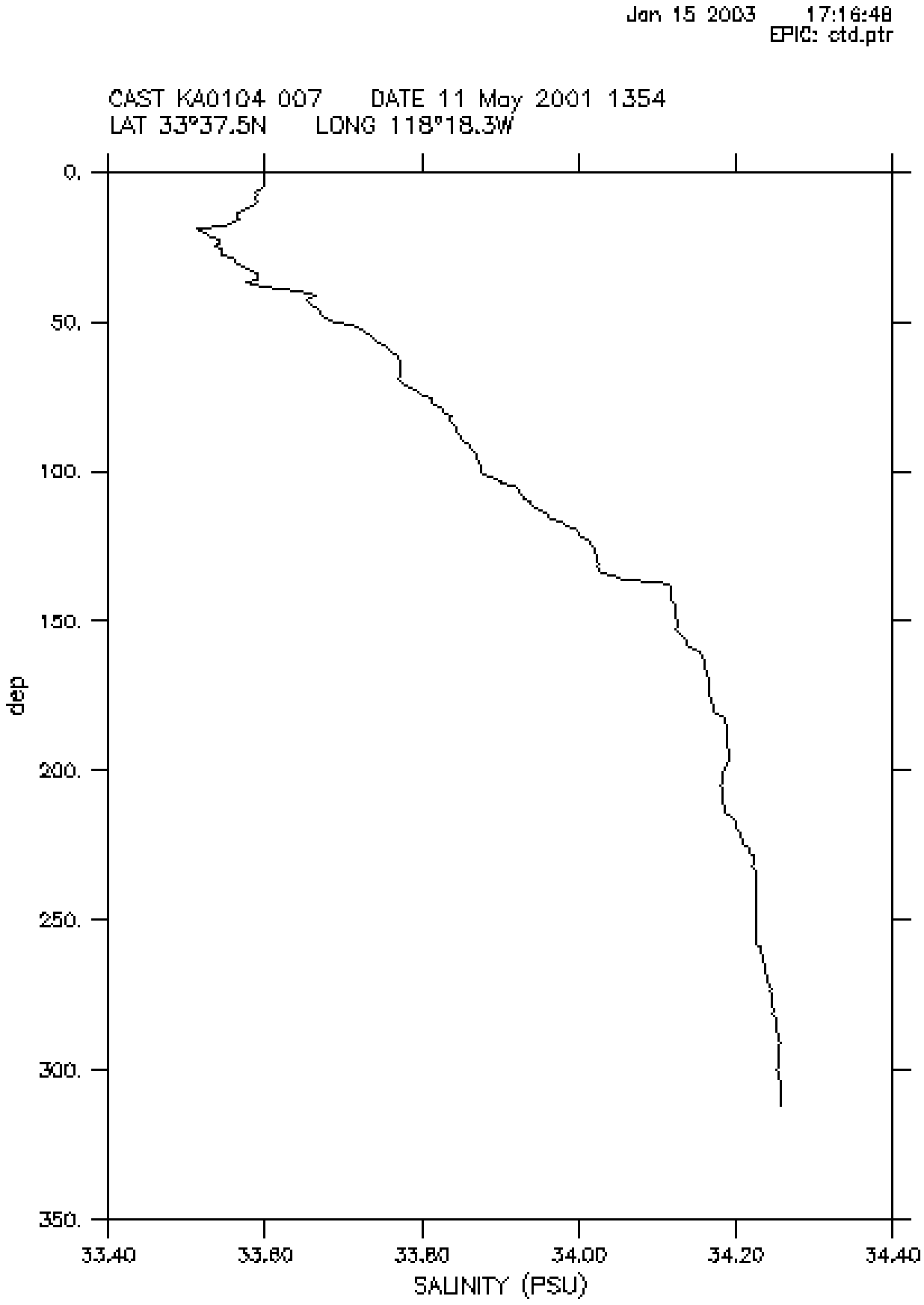
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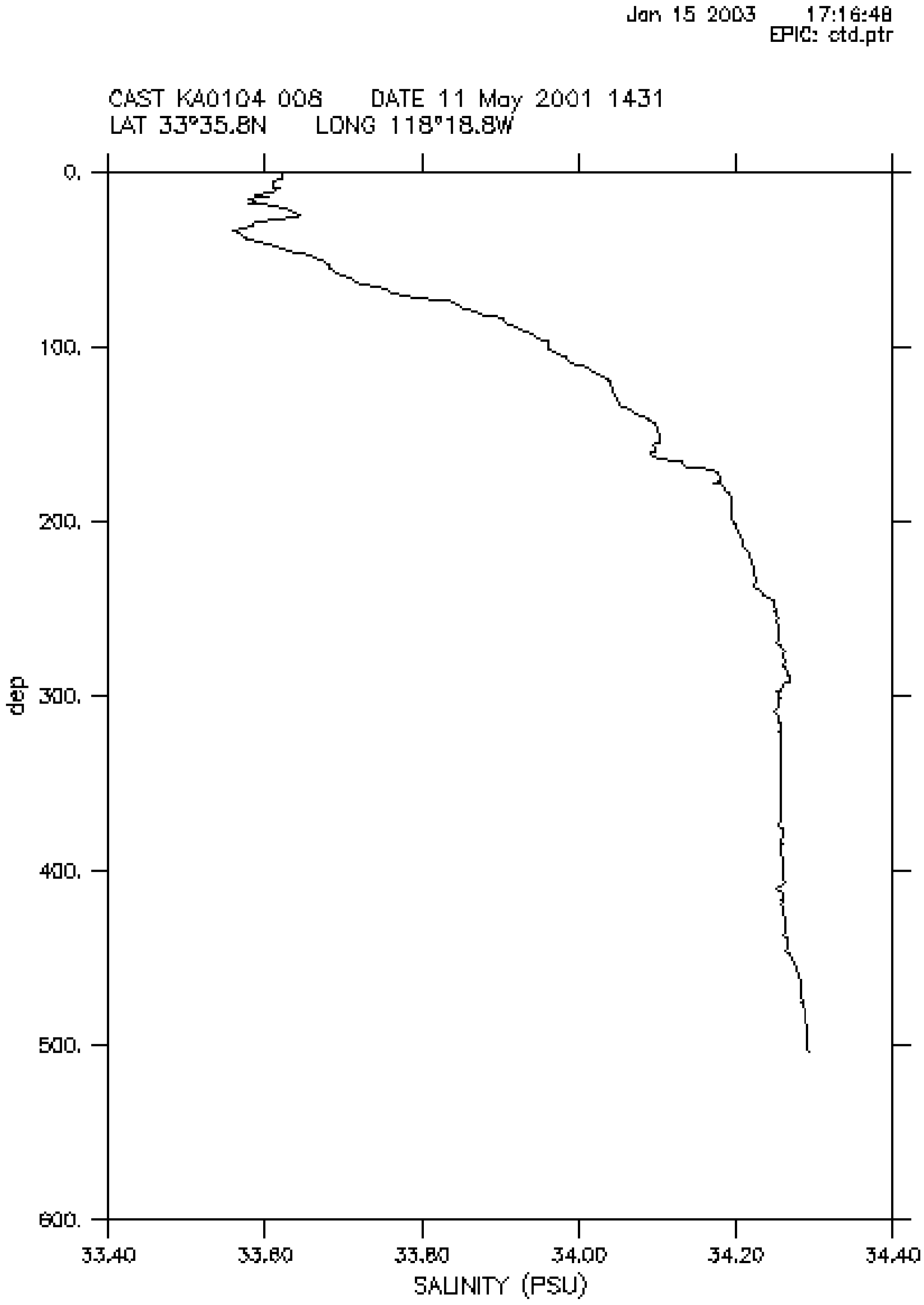
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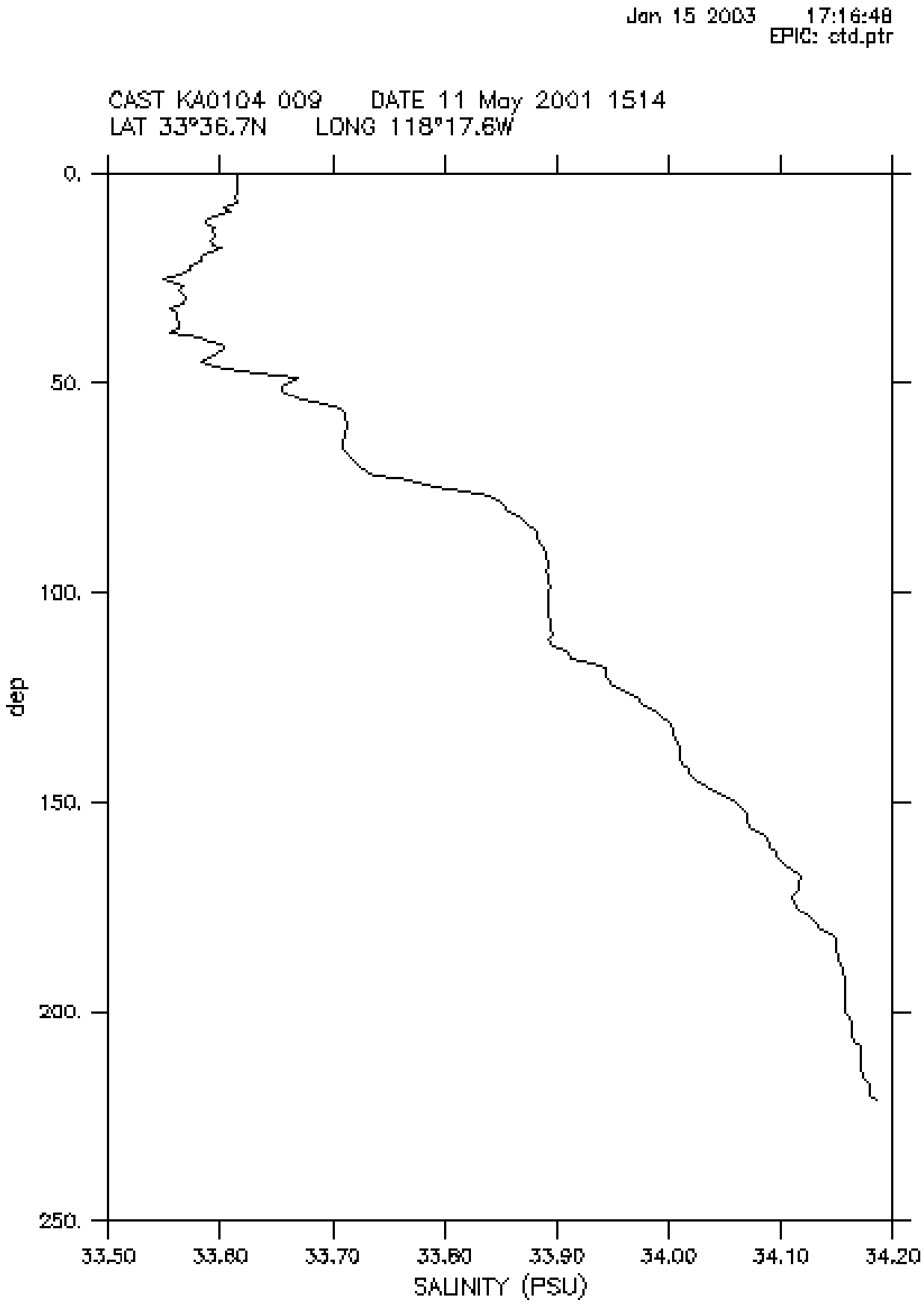
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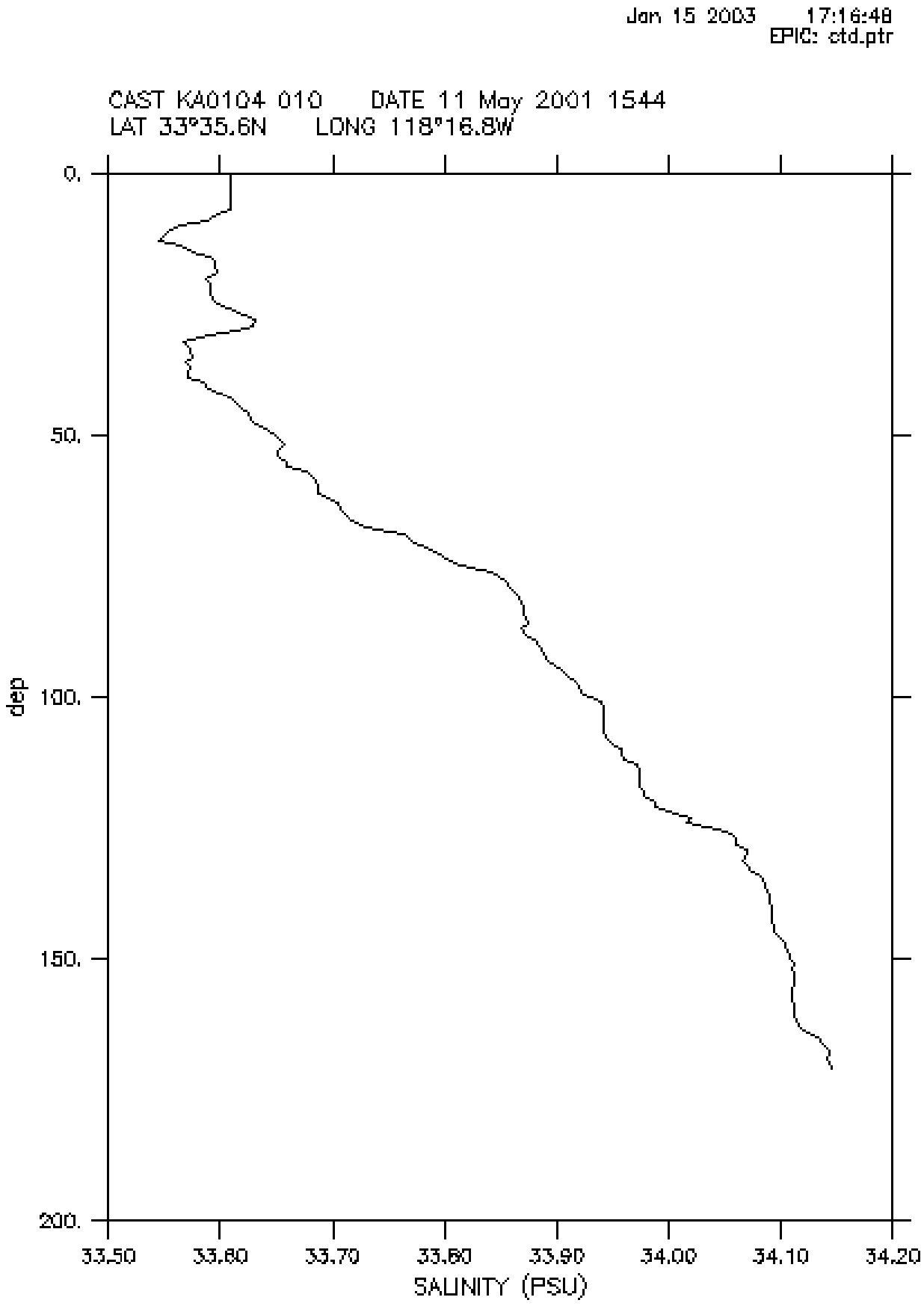
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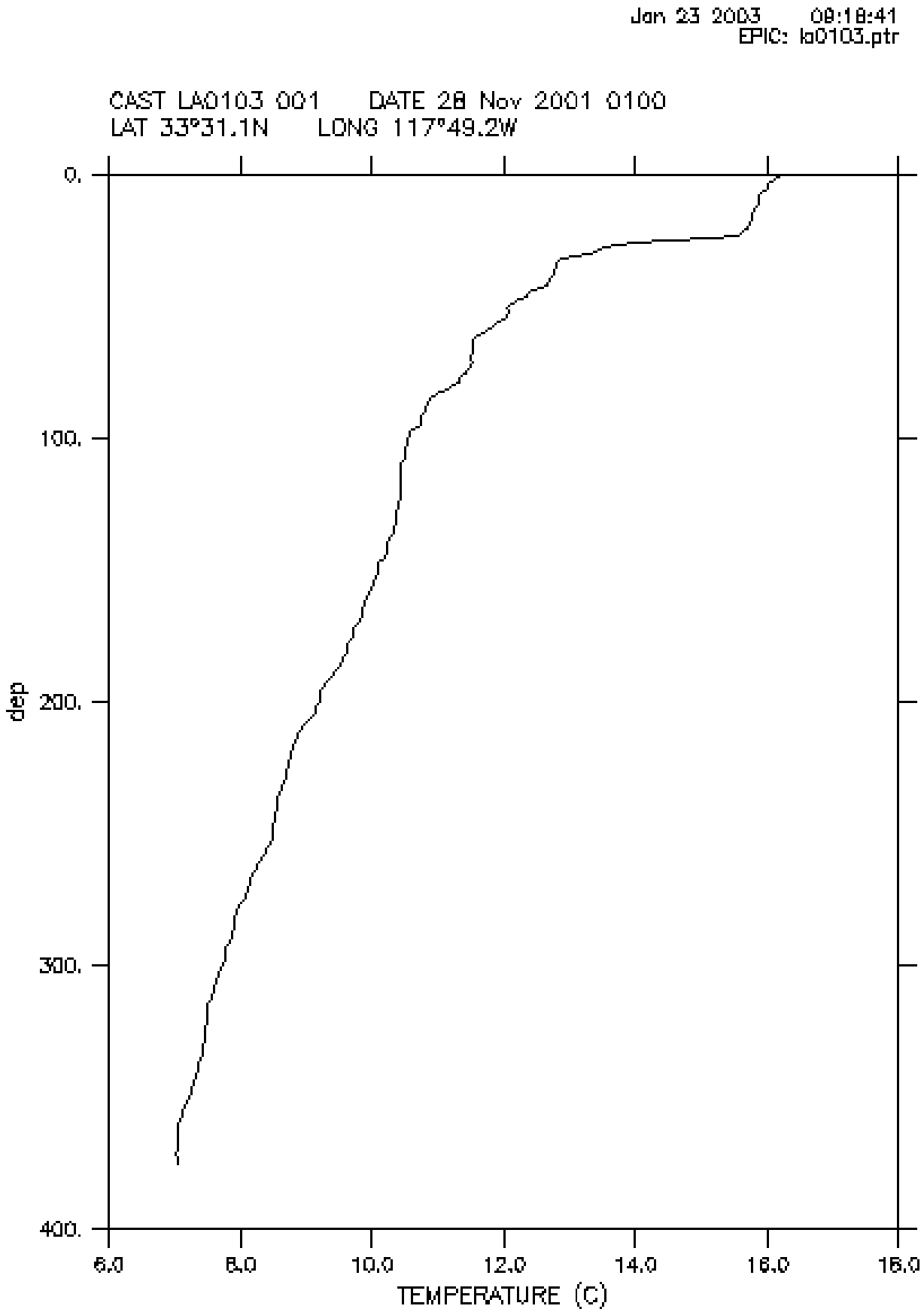
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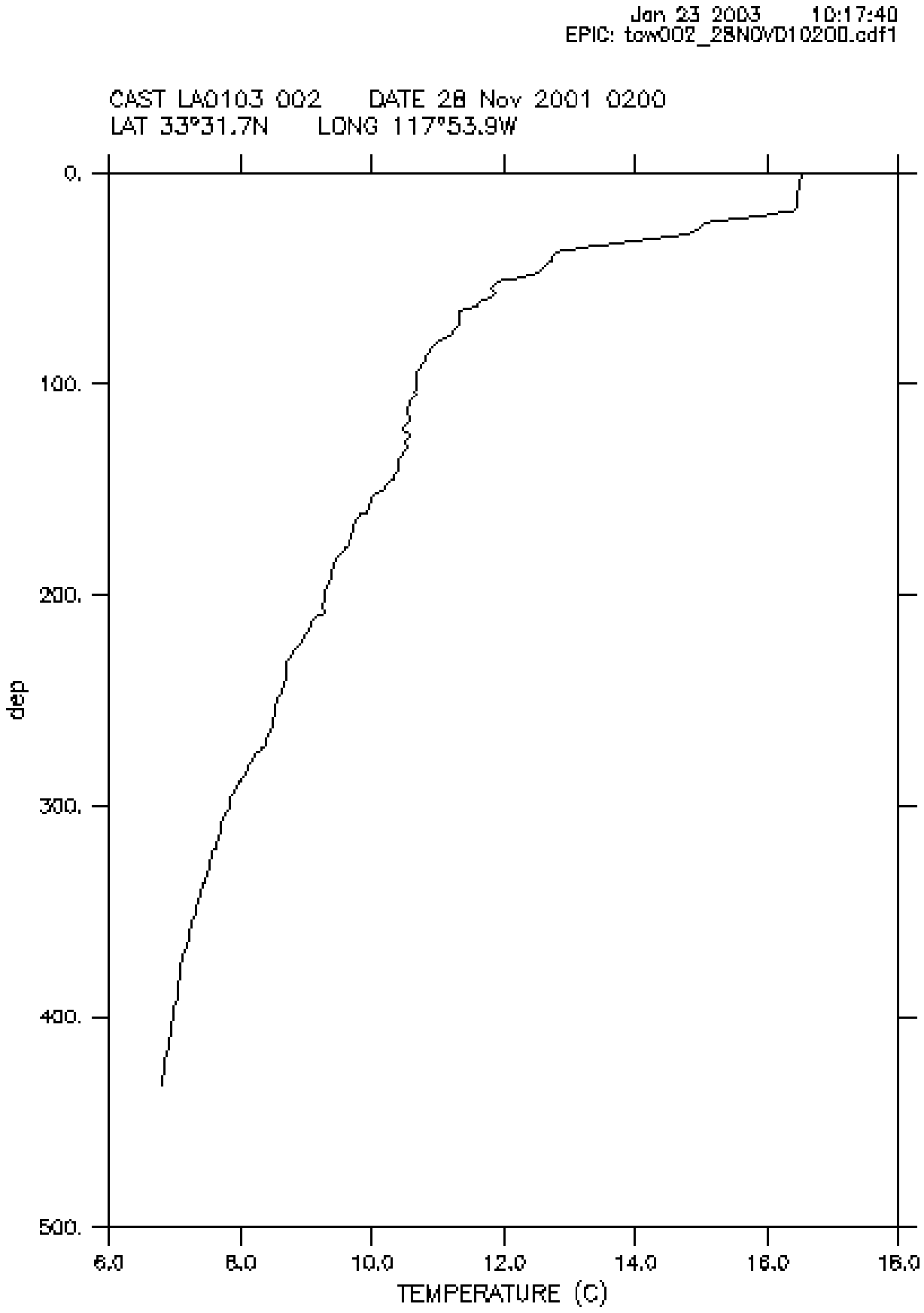
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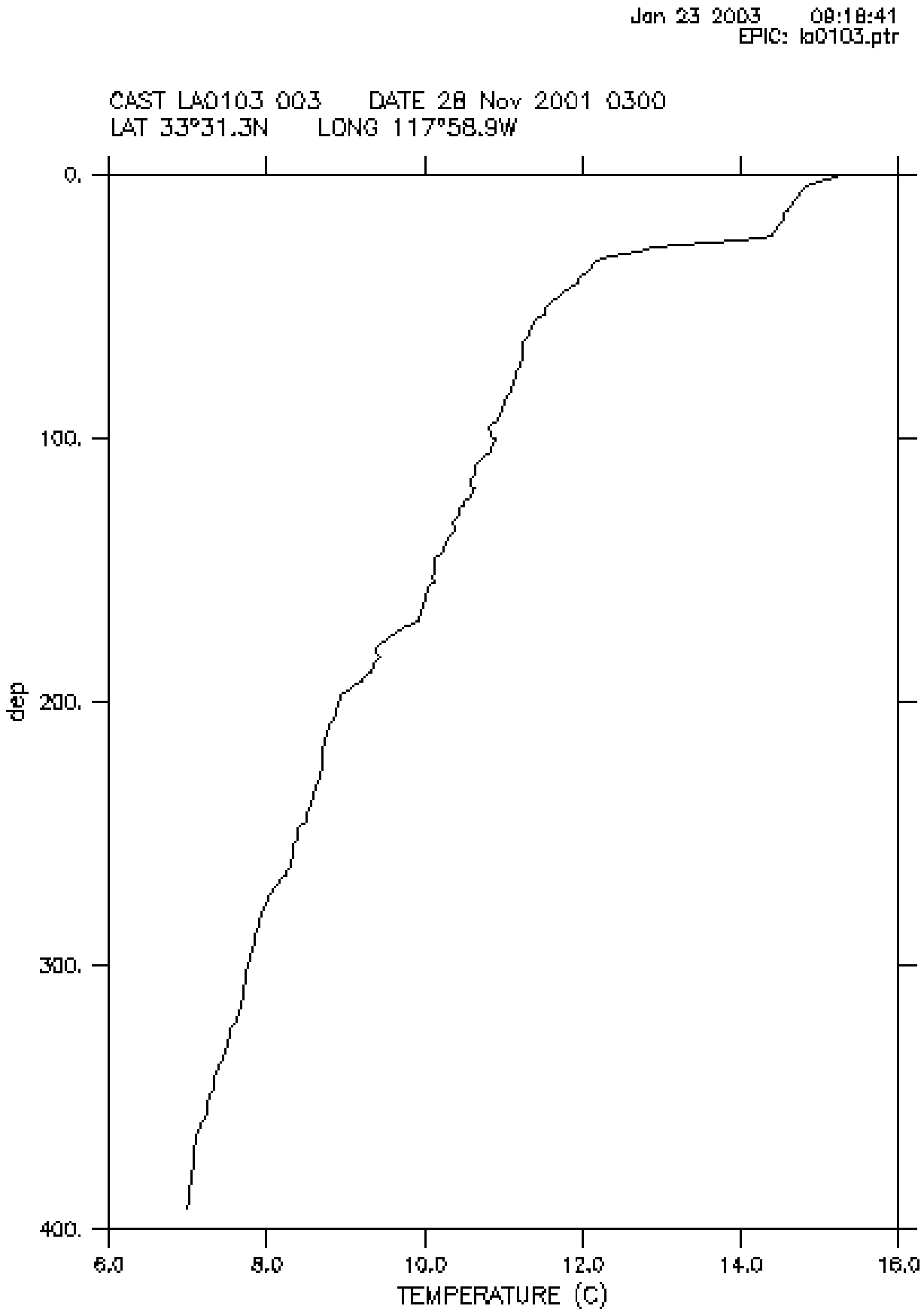
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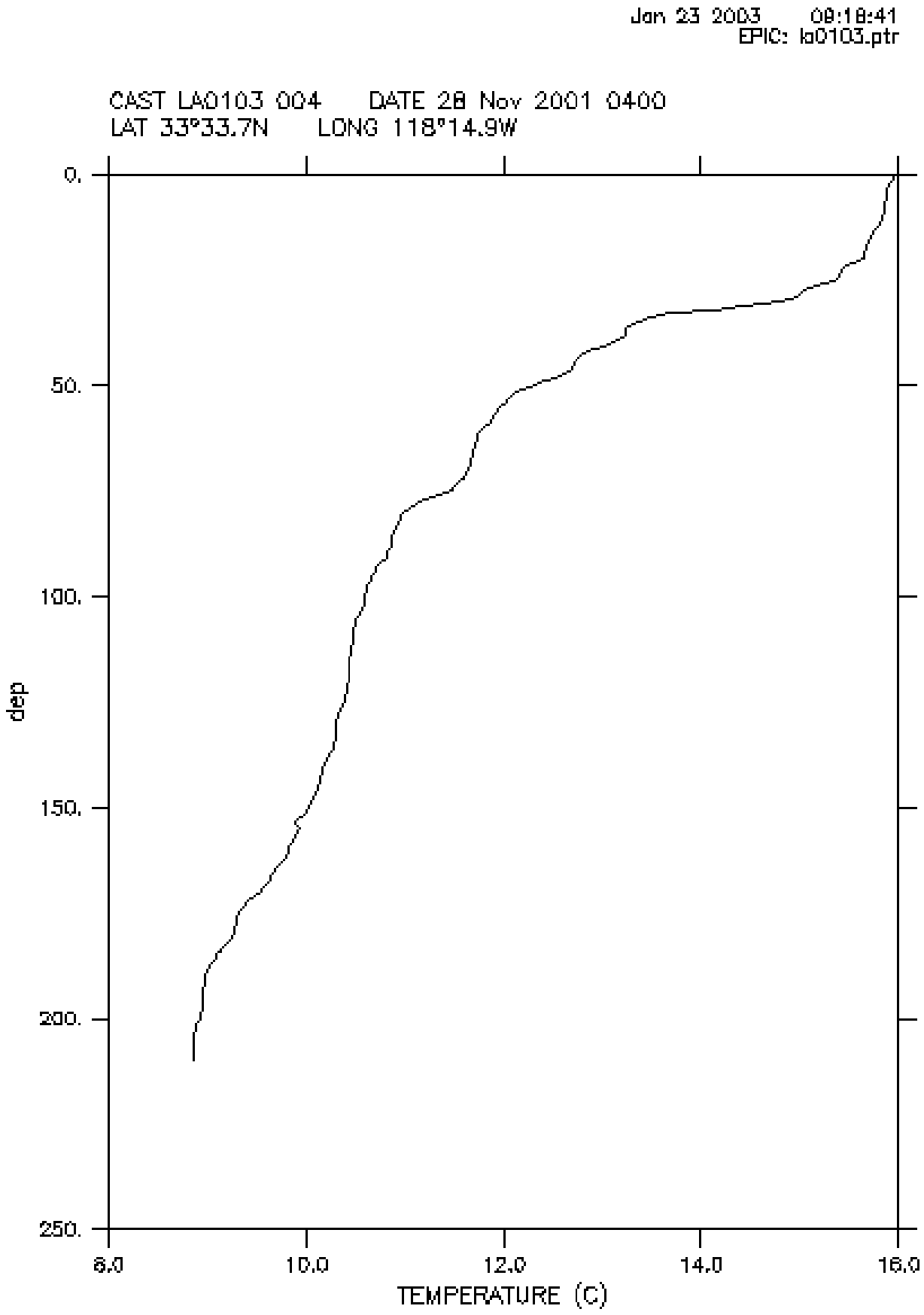
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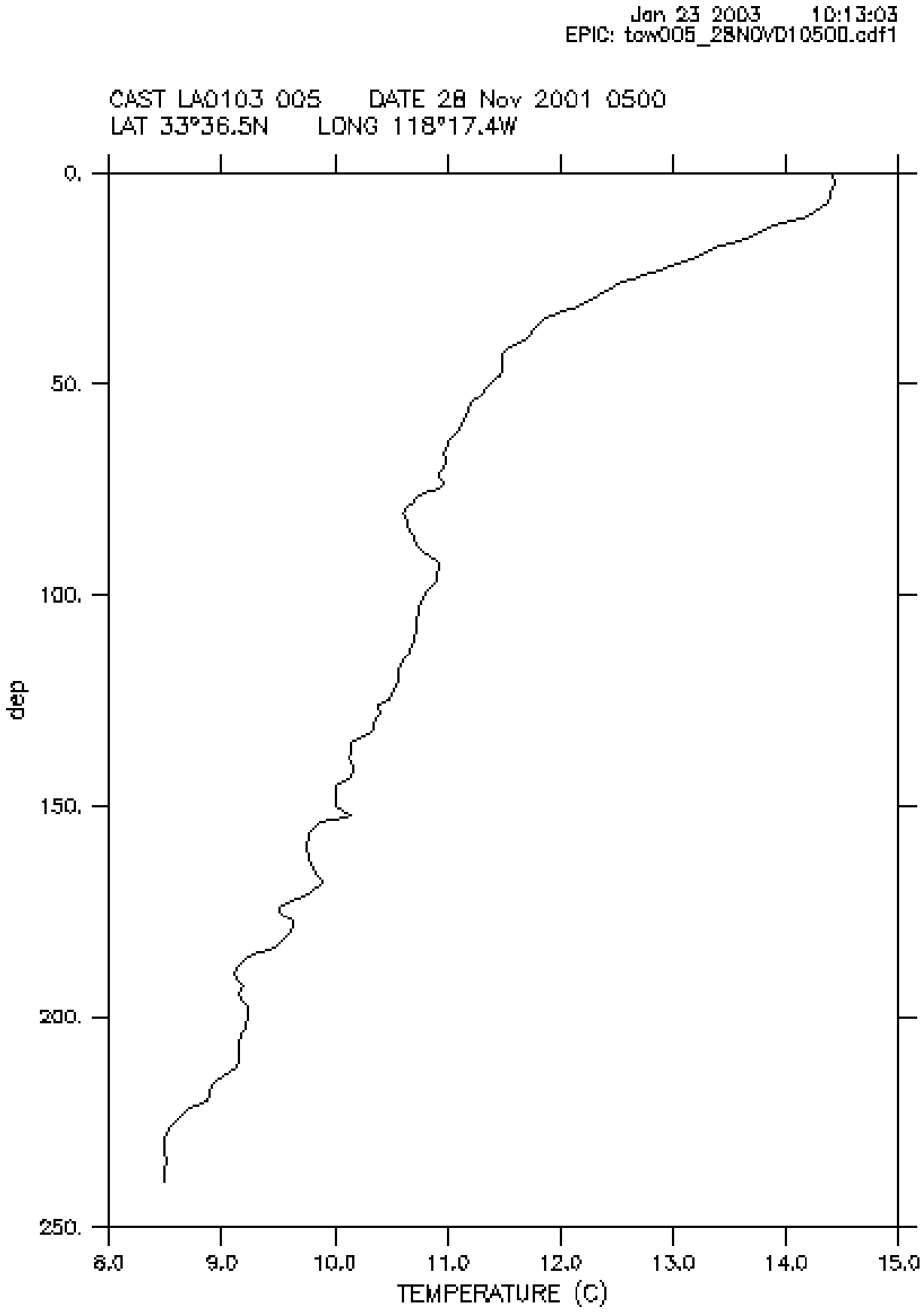
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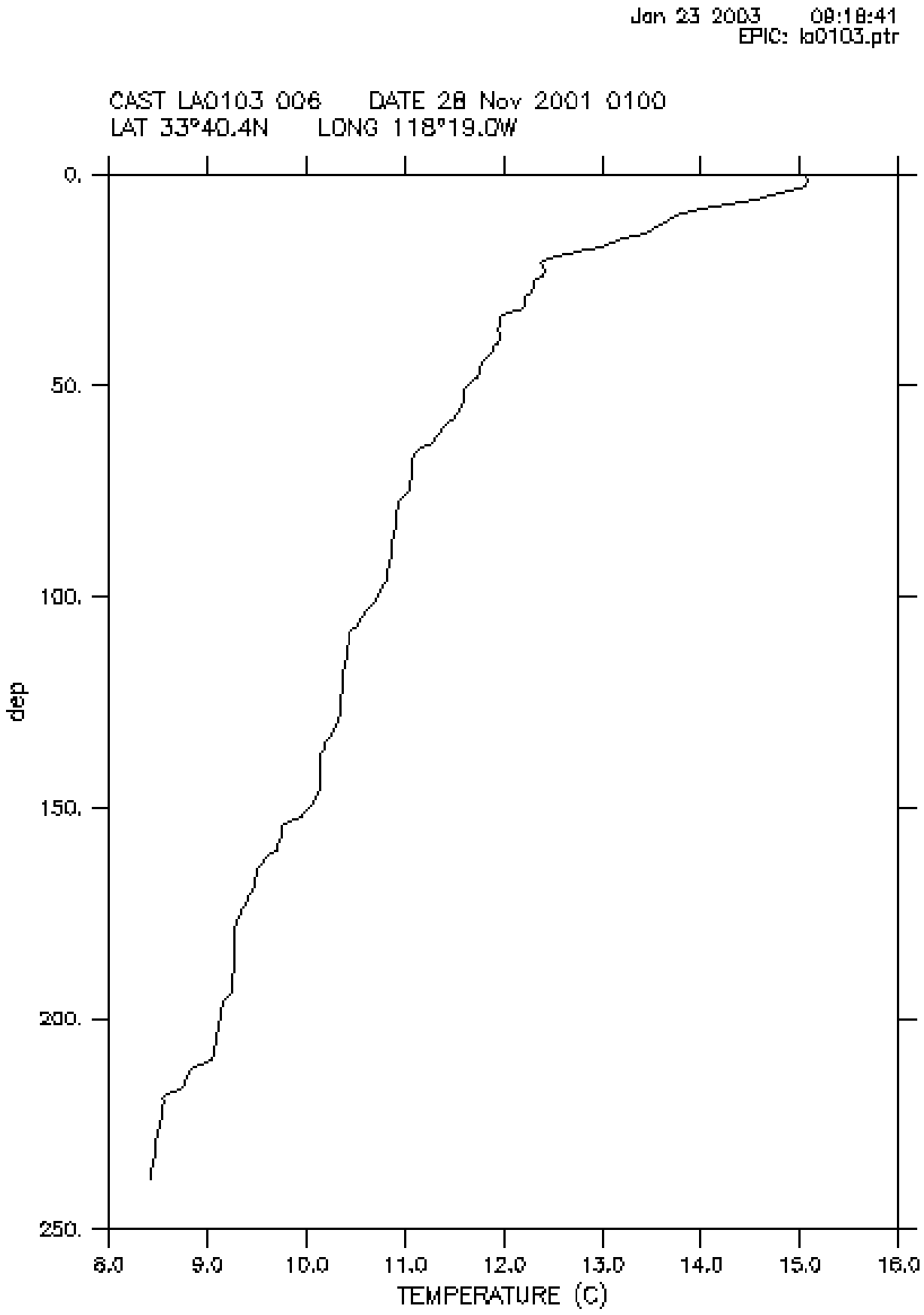
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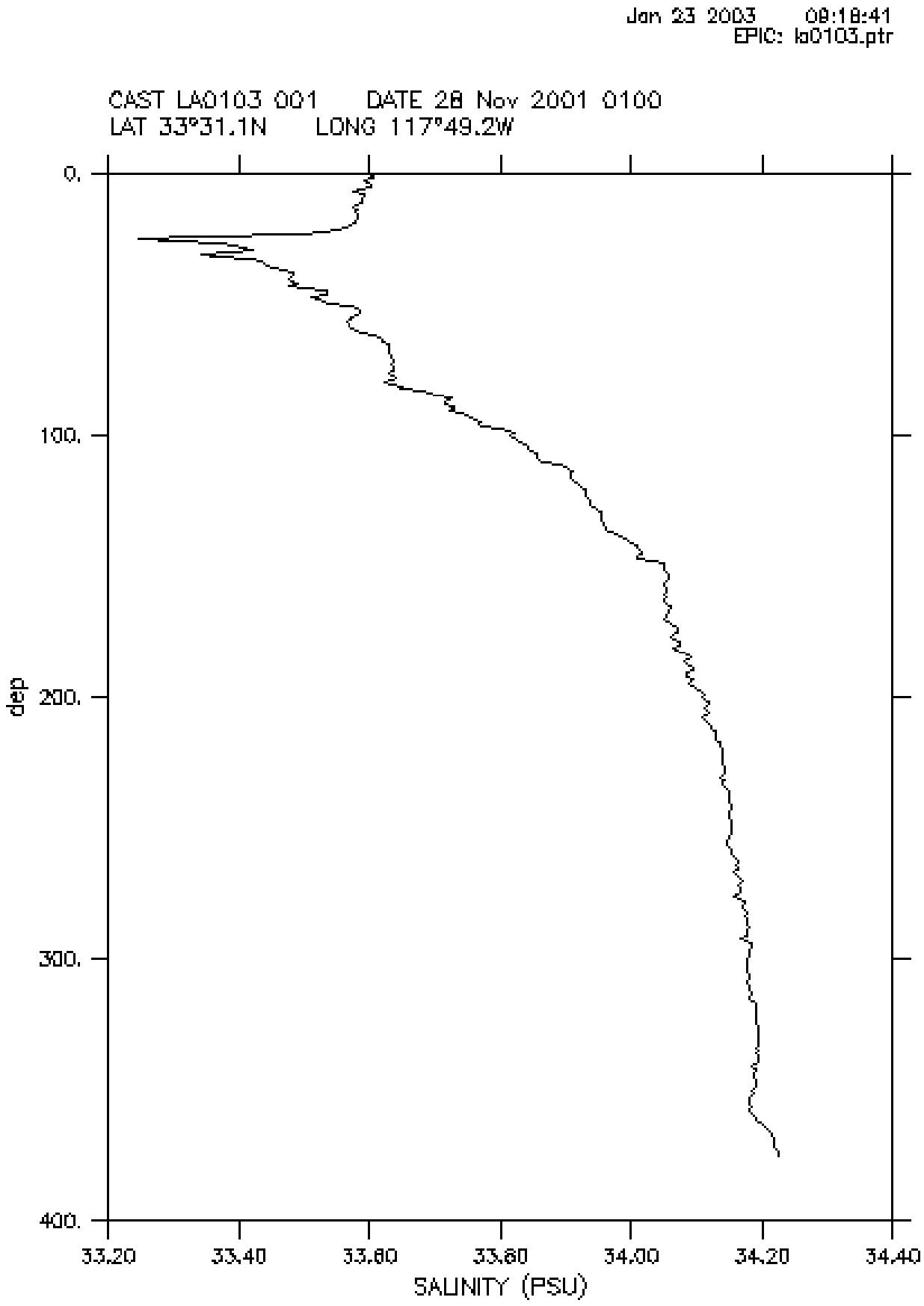
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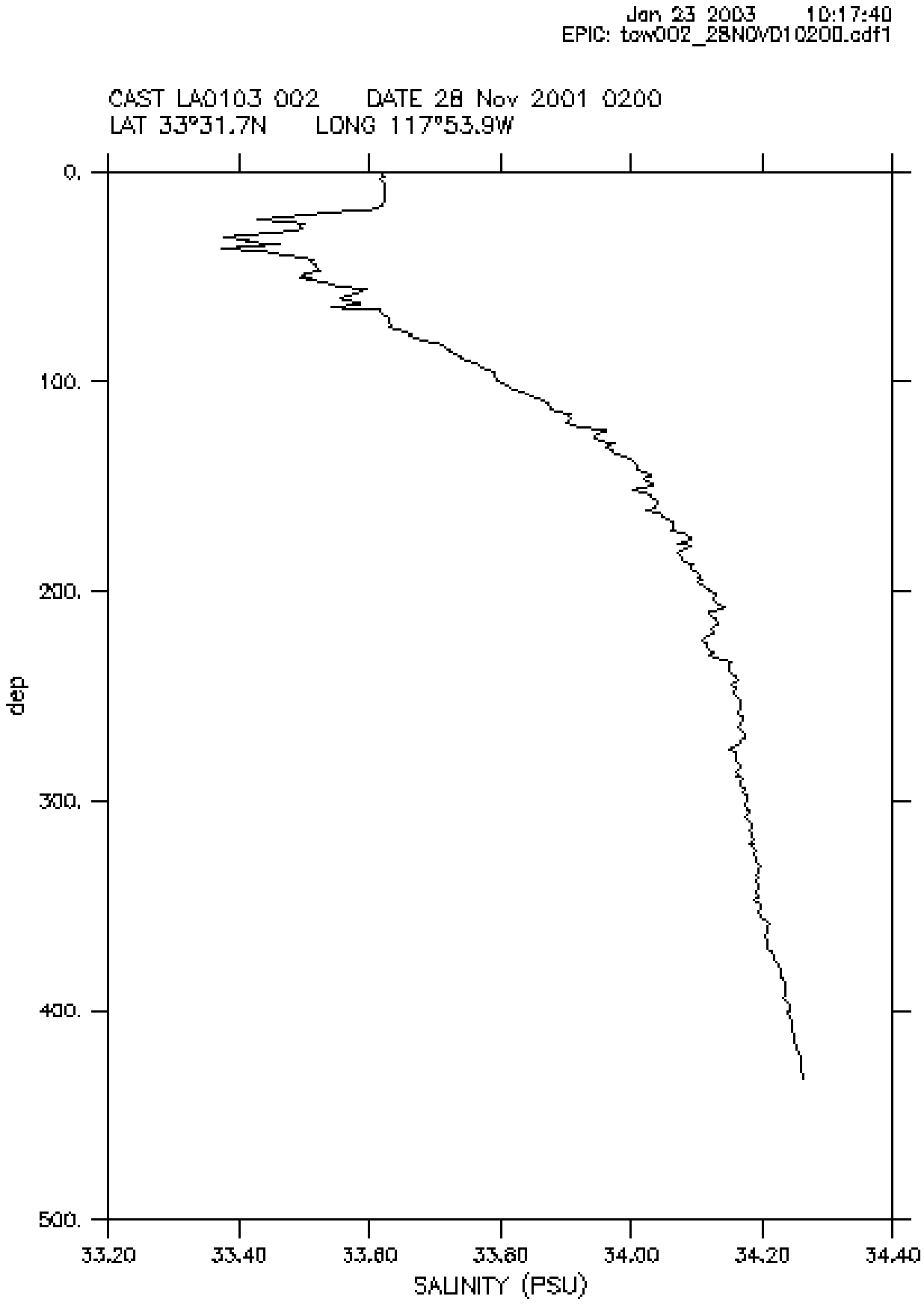
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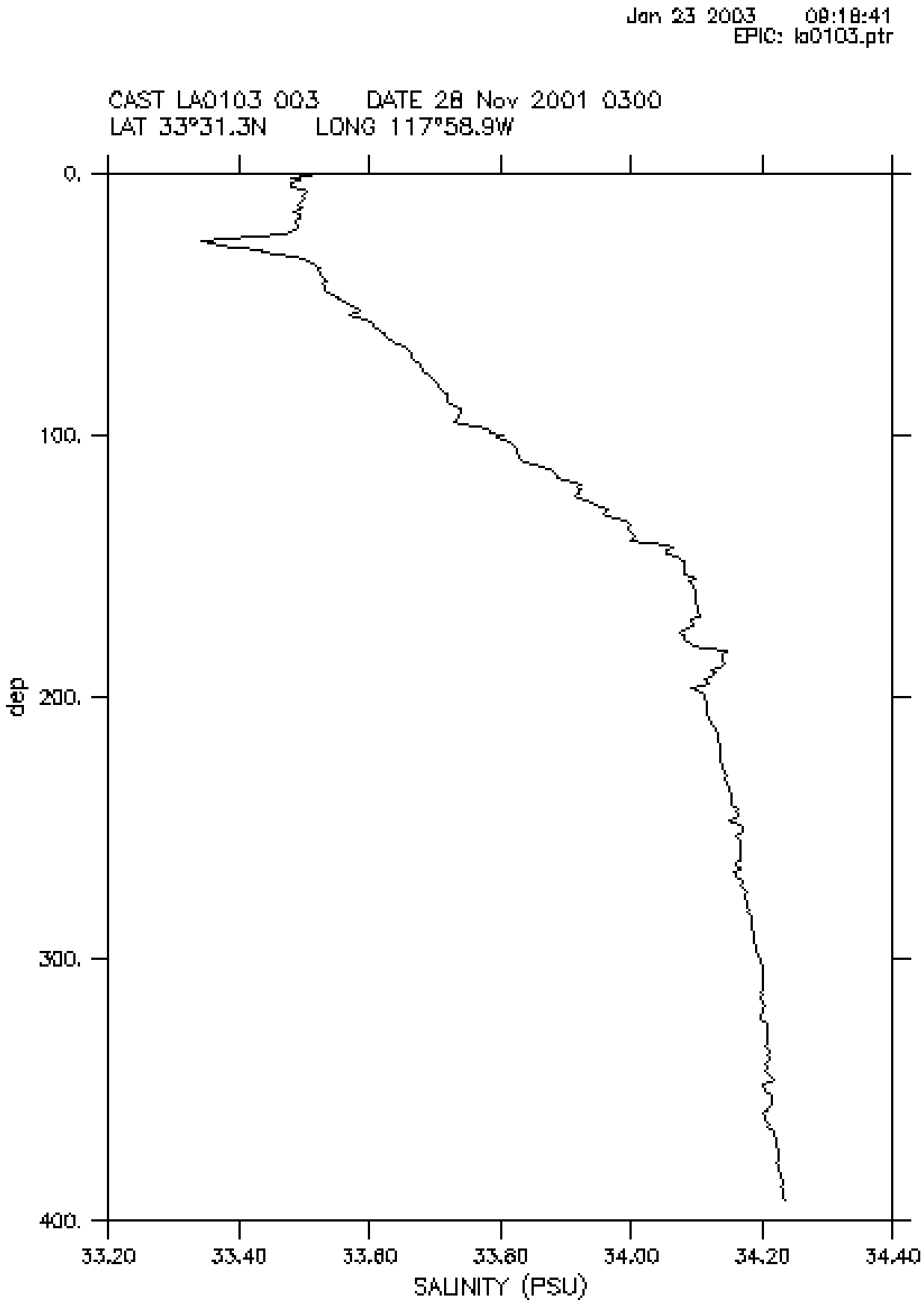
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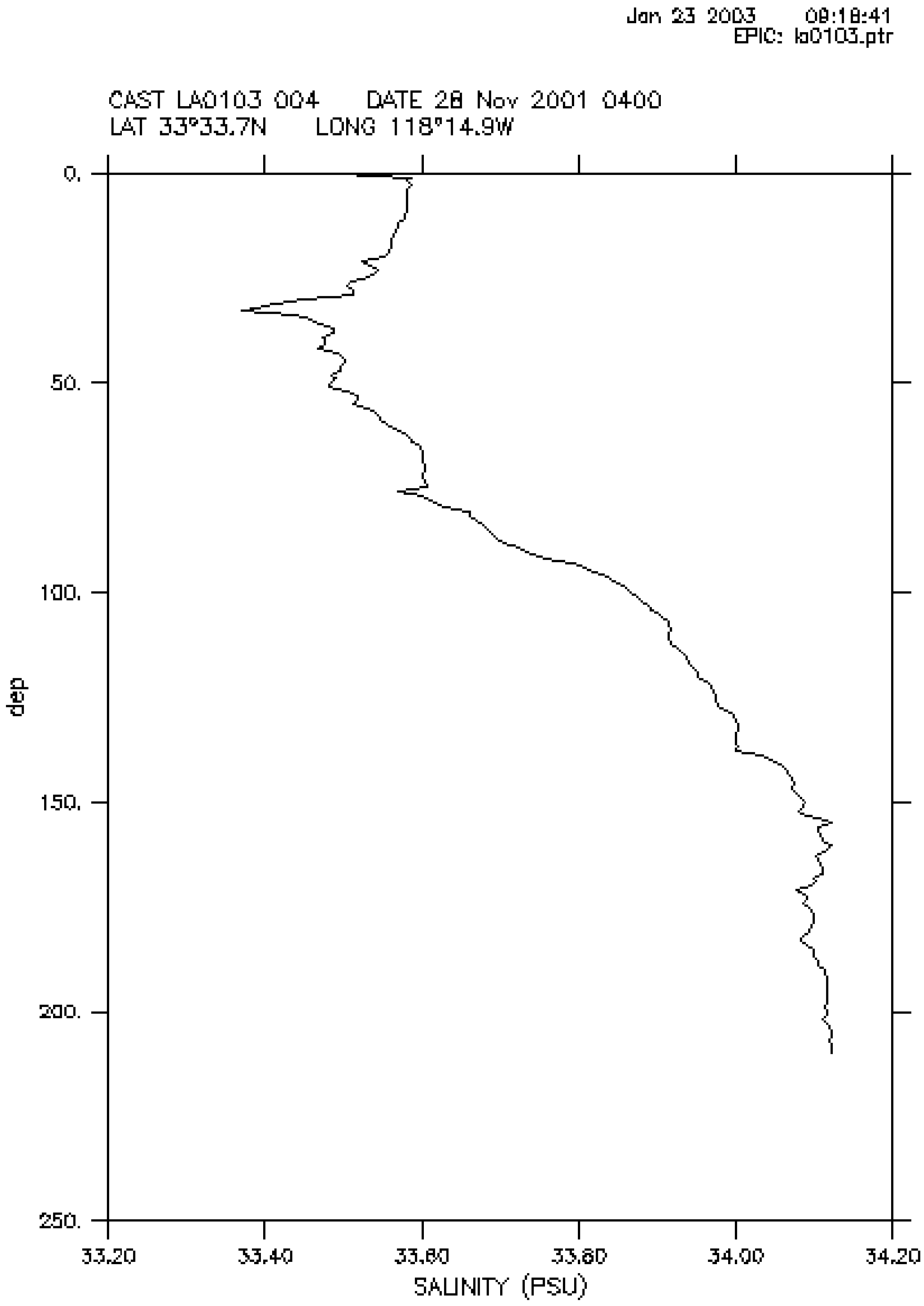
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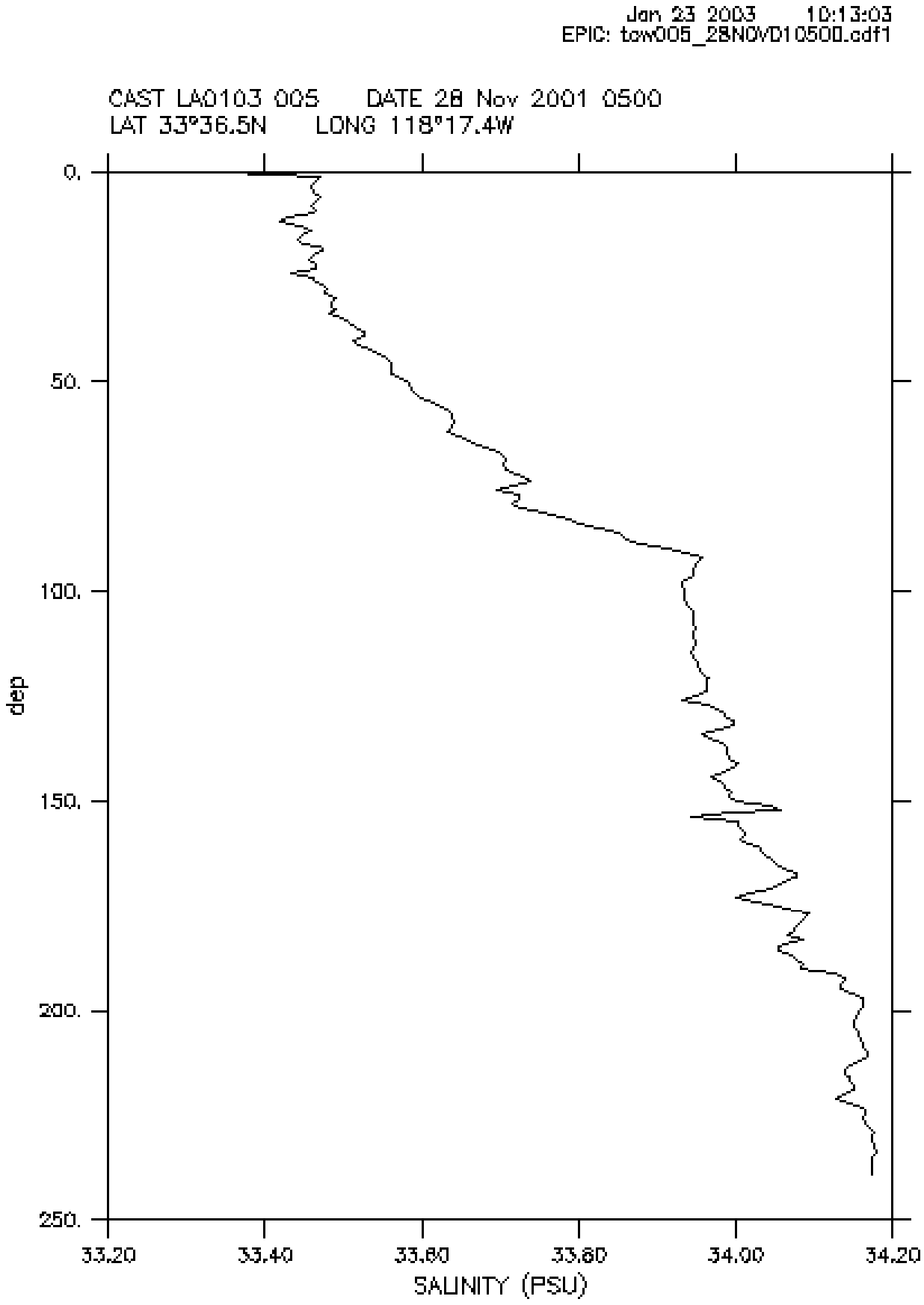
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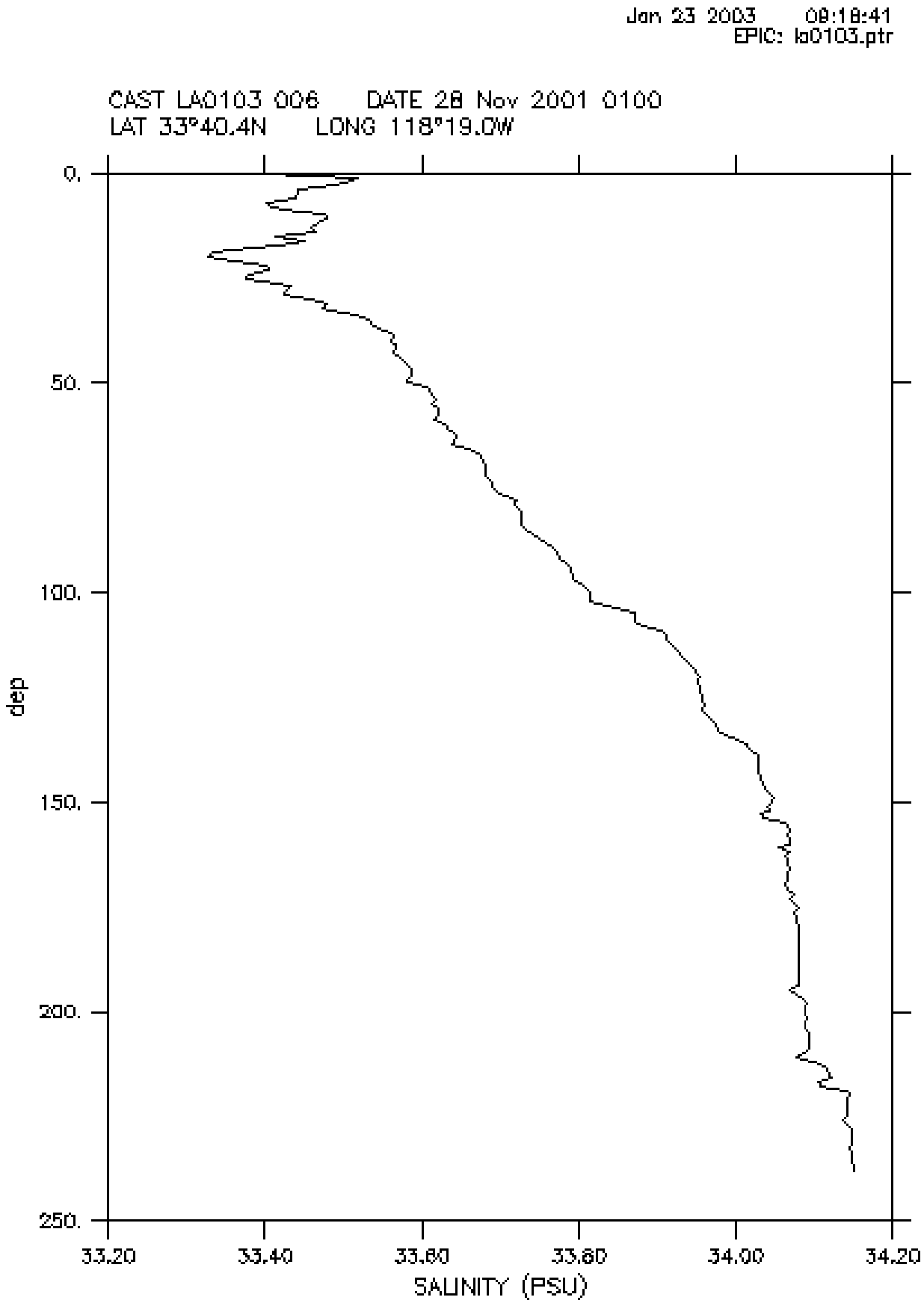
SALINITY (PSU)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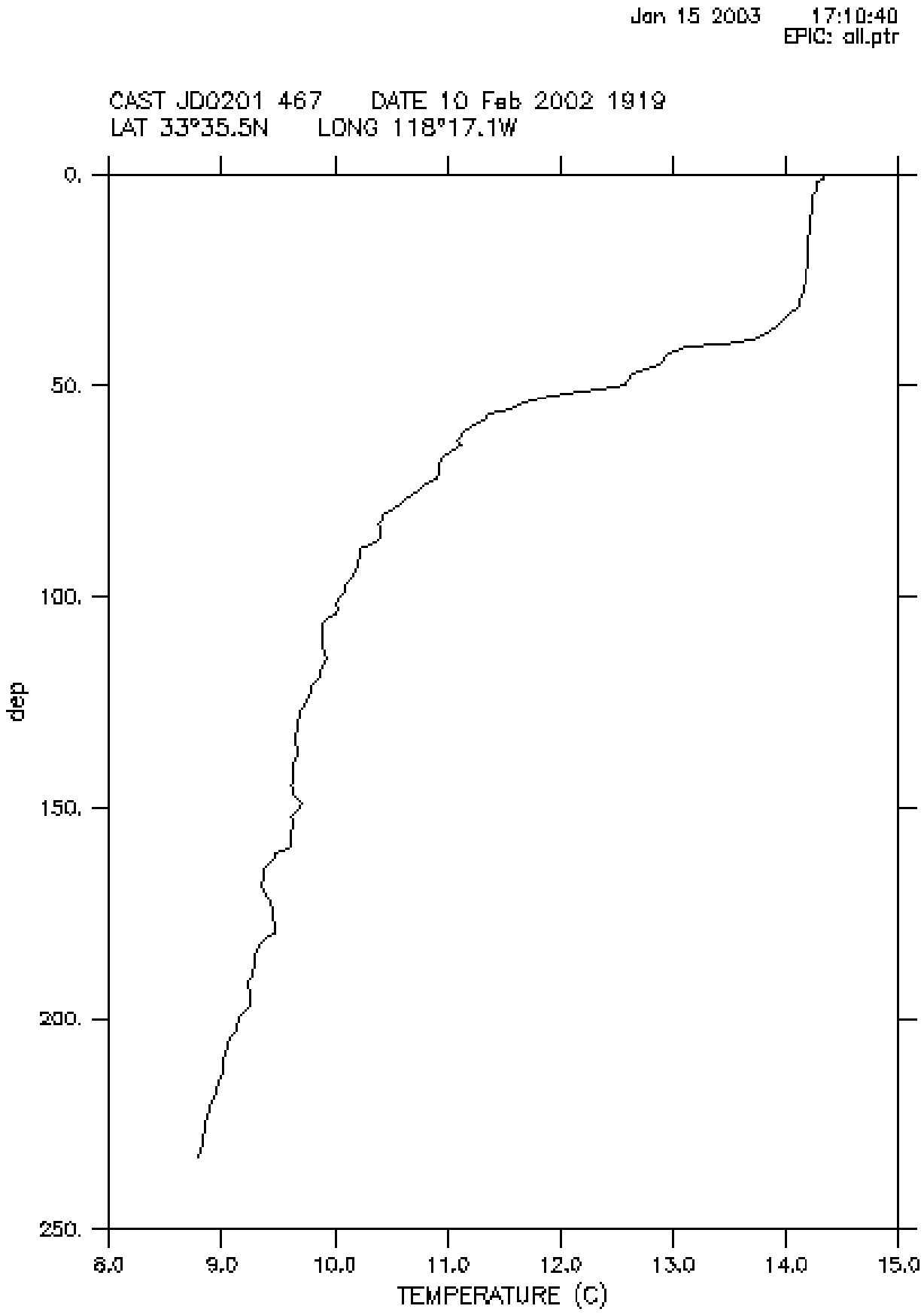
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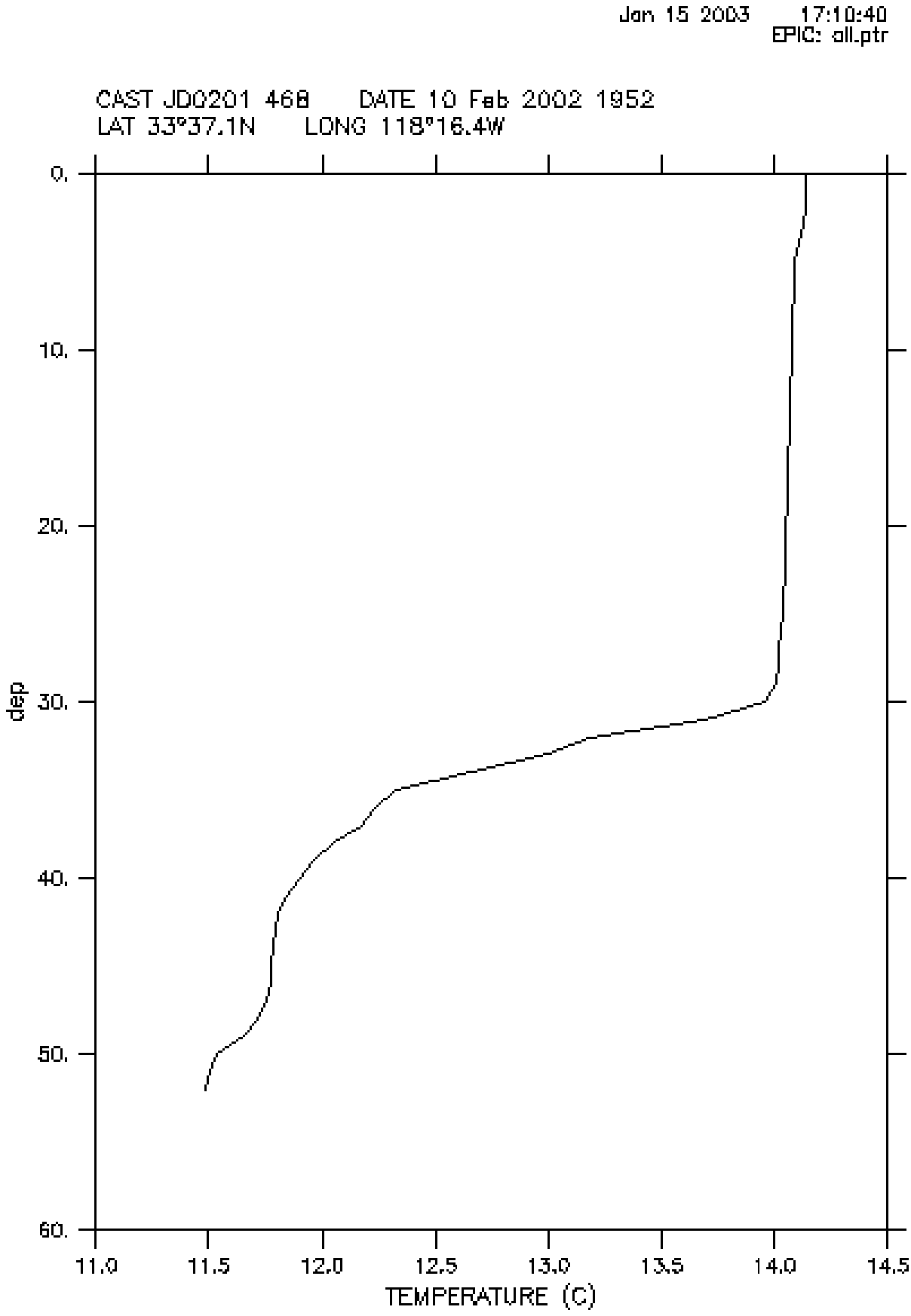
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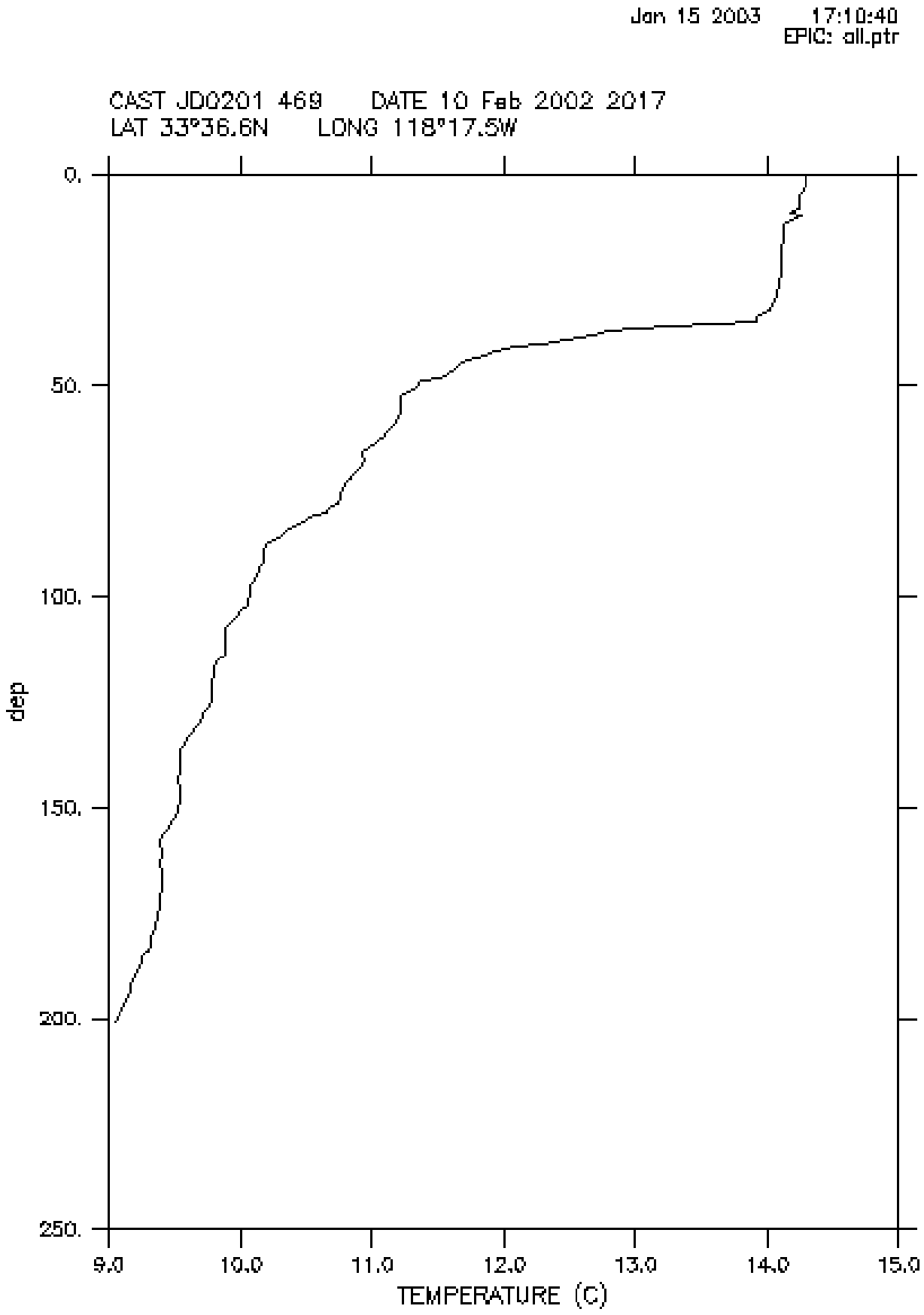
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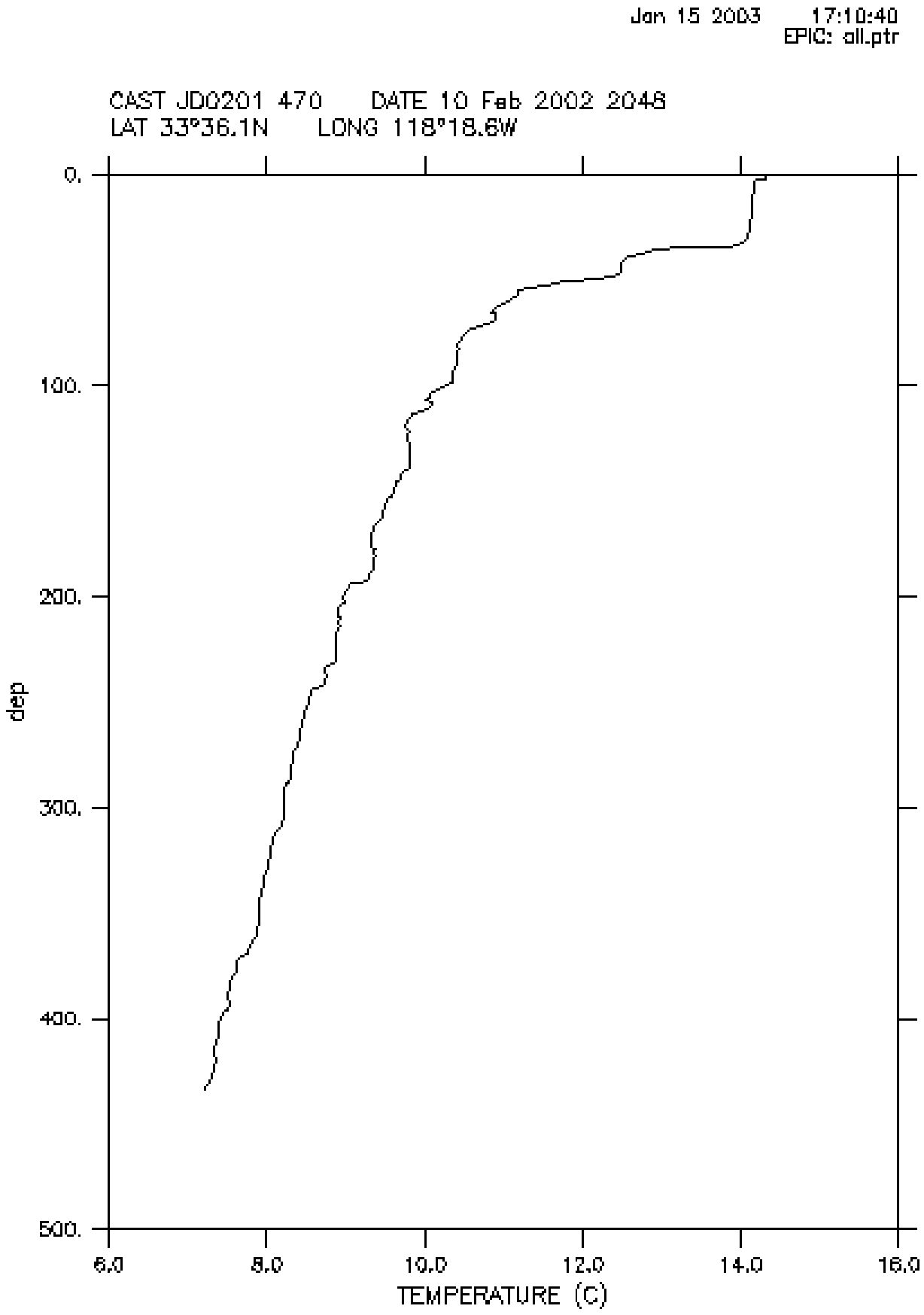
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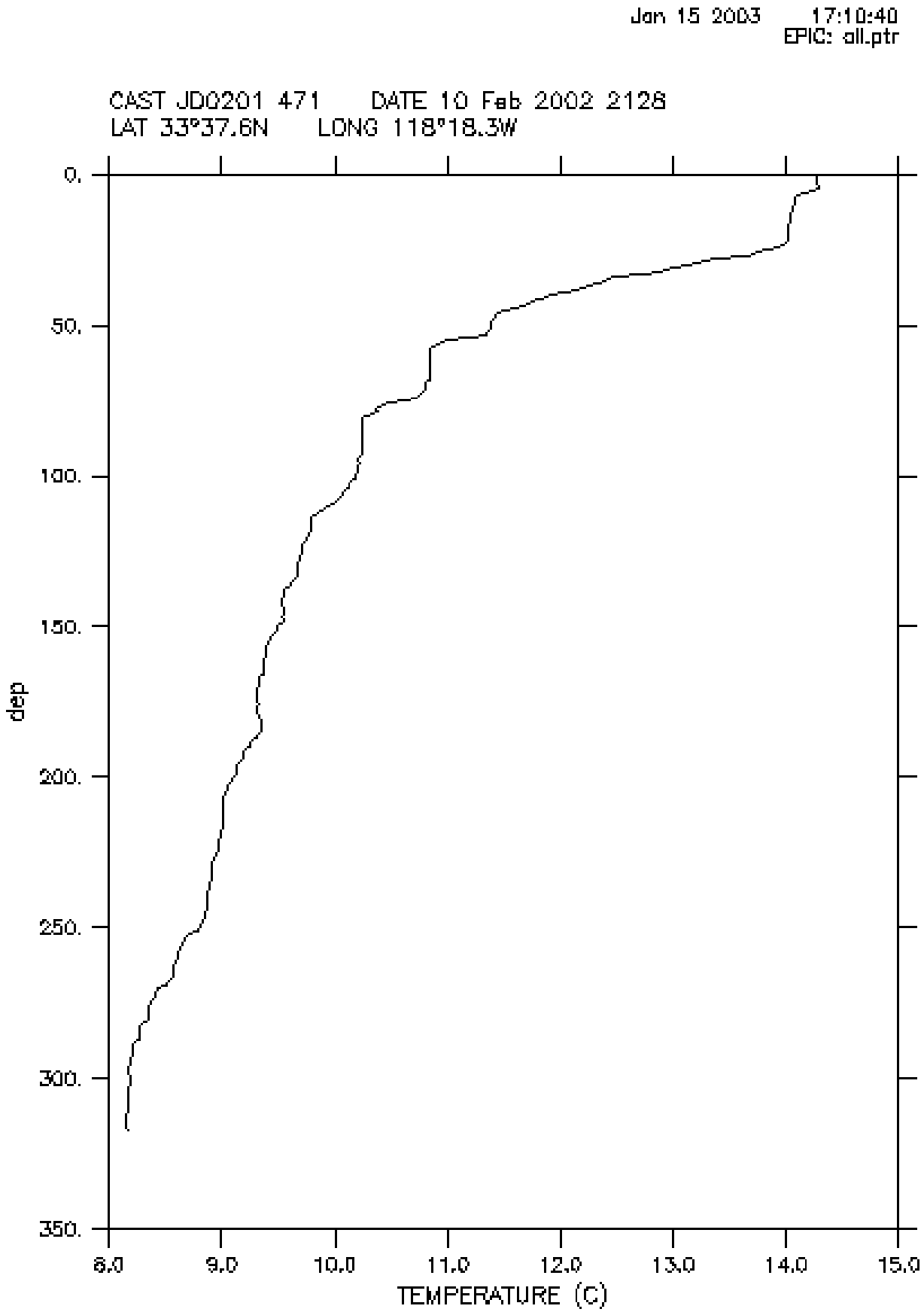
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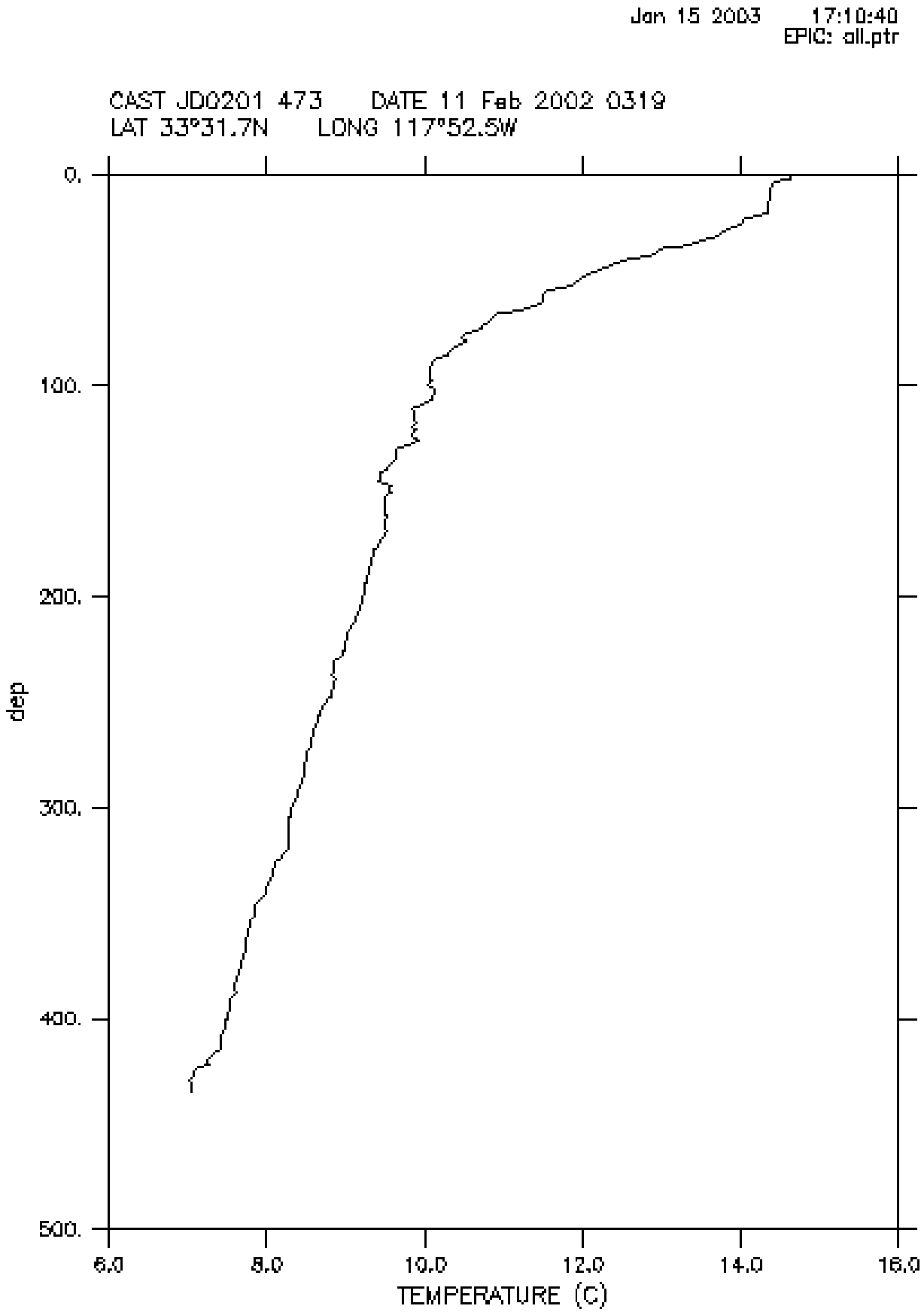
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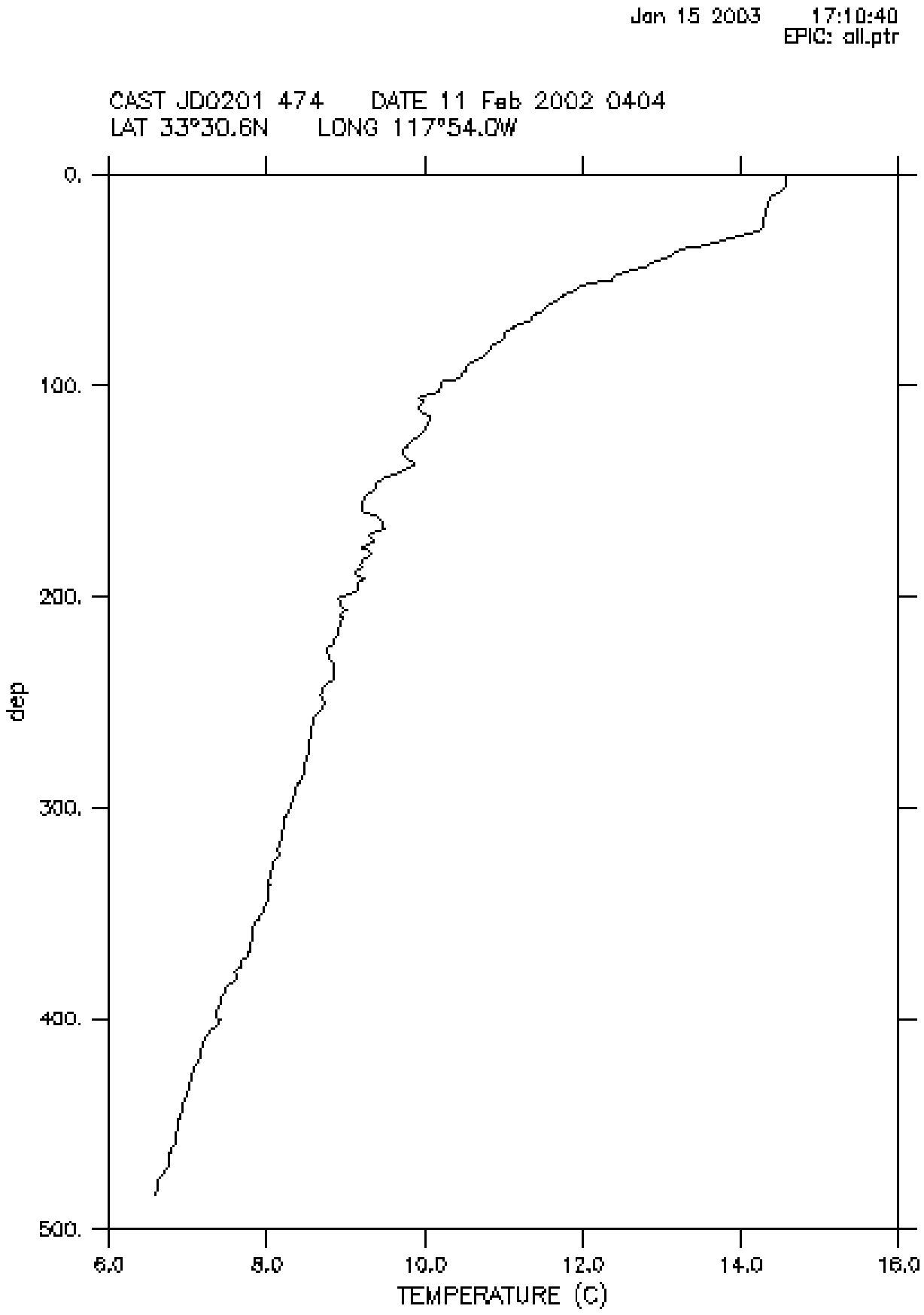
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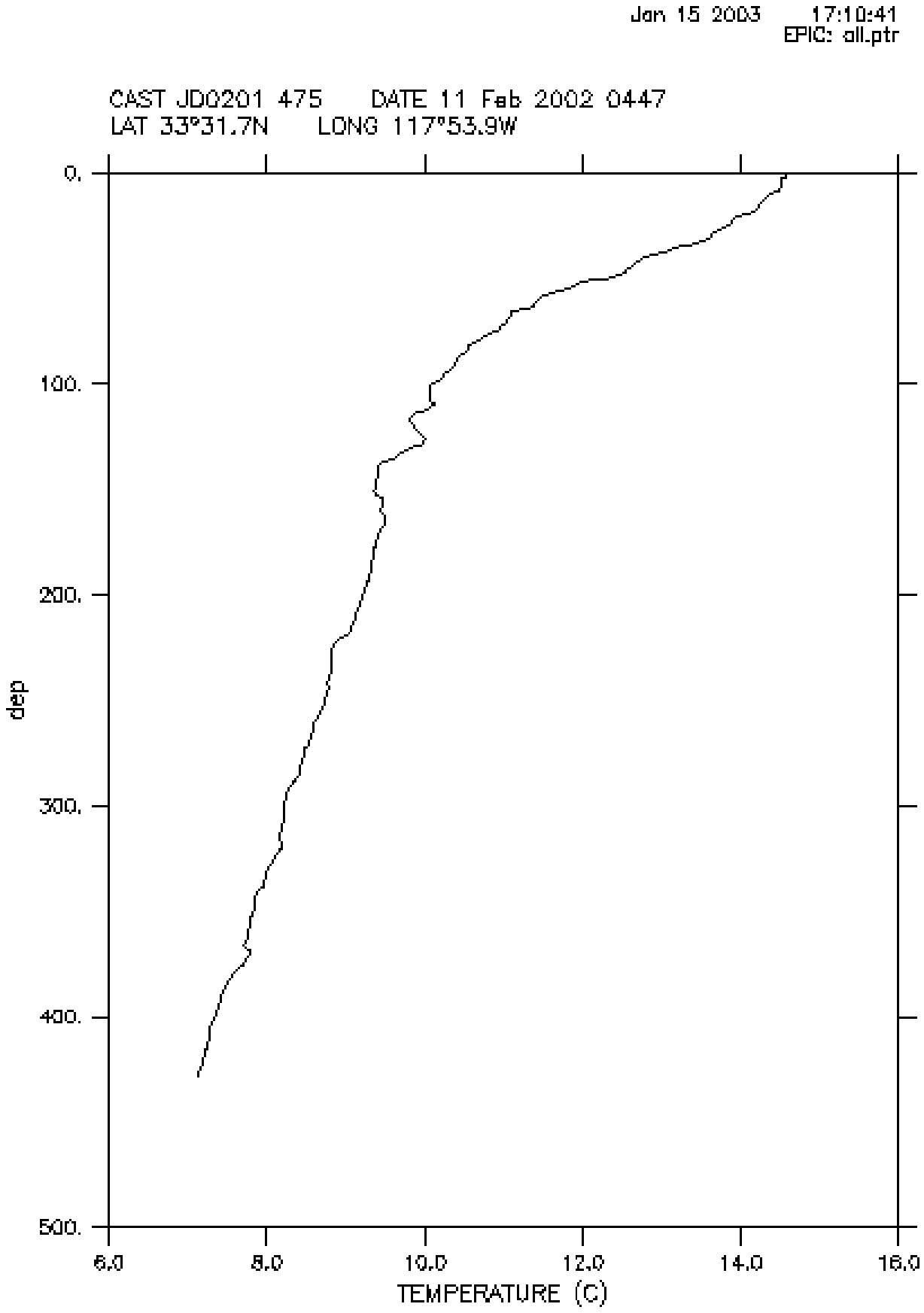
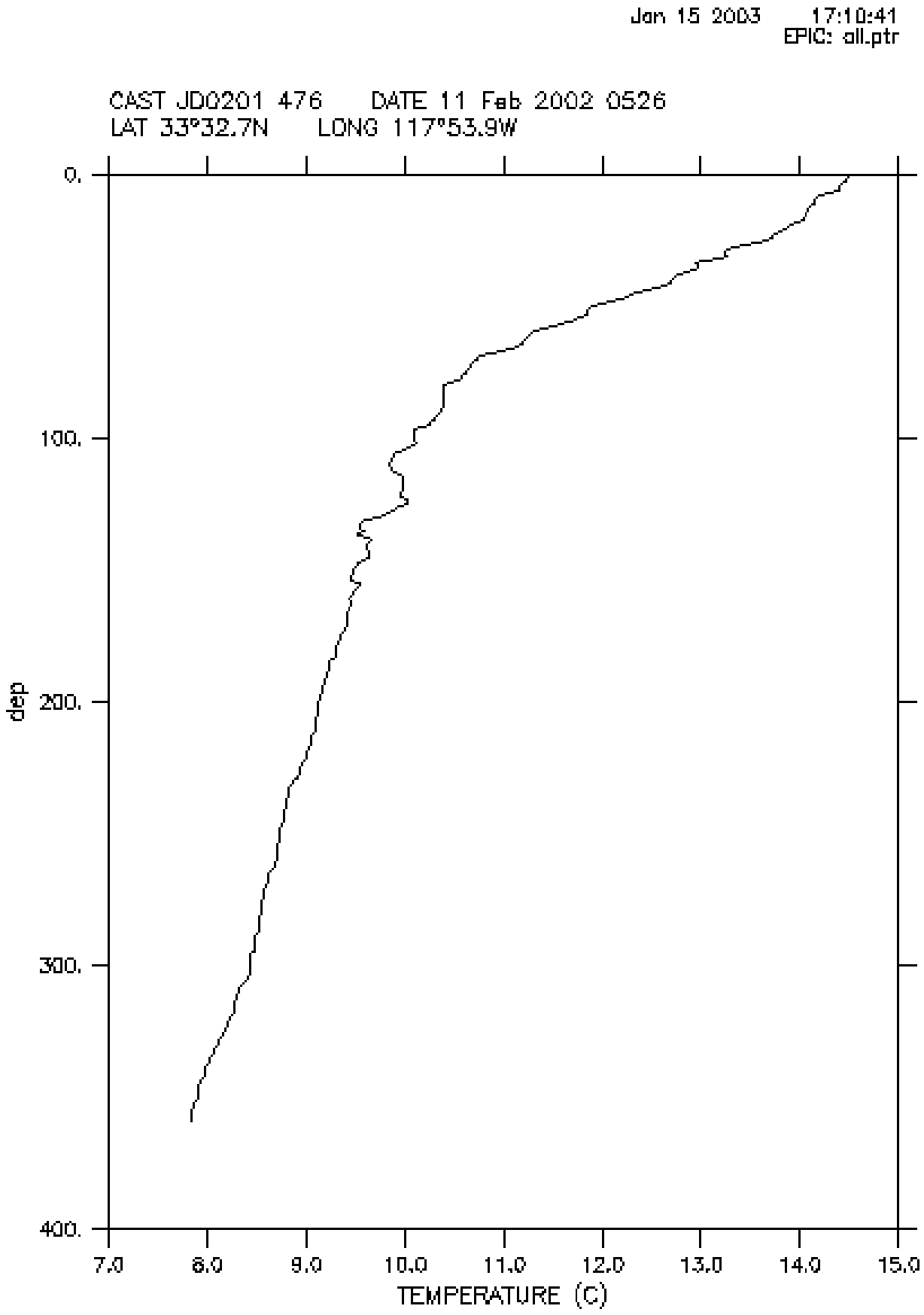
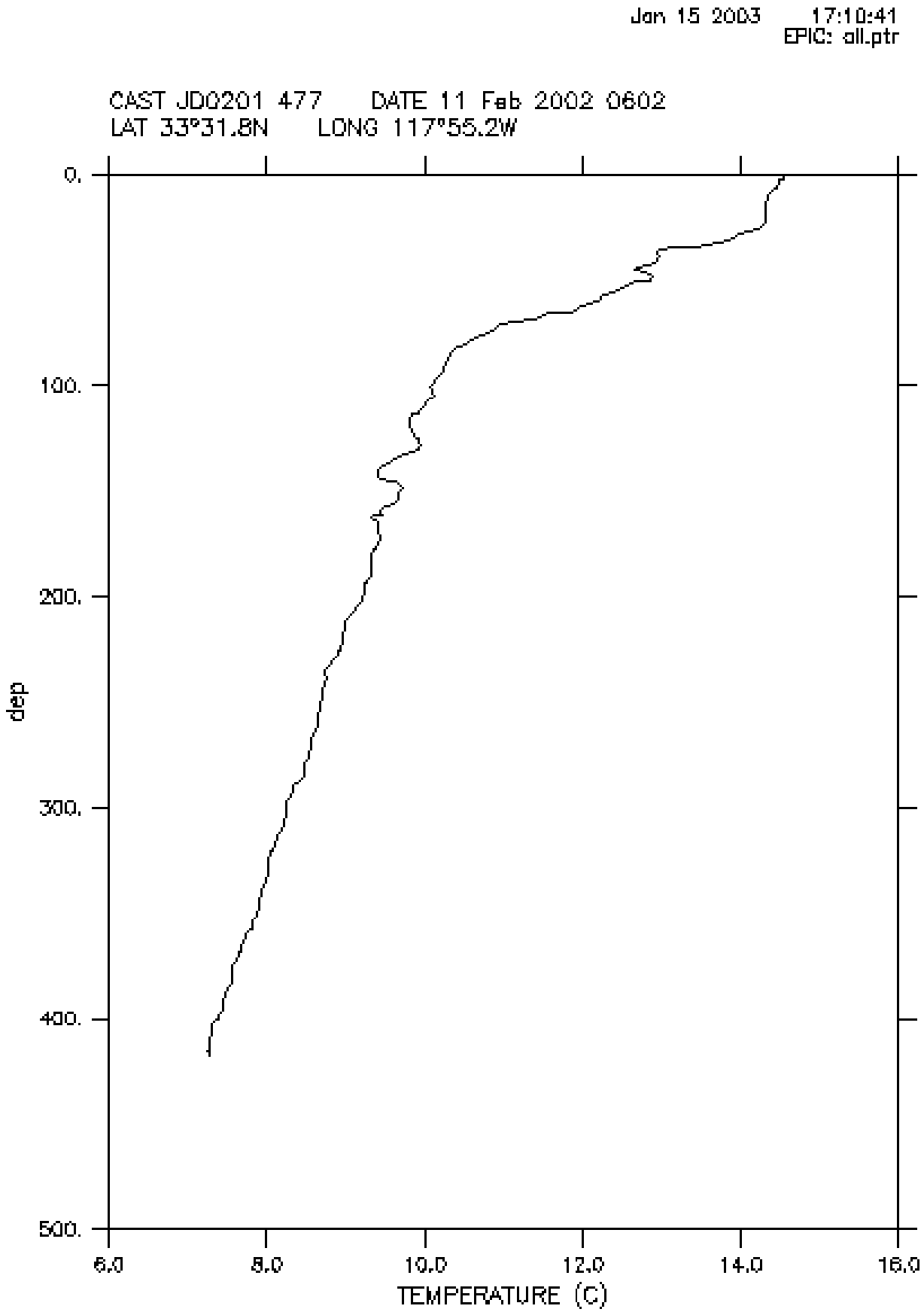
300.
400.
500.
dep
6.0
8.0
10.0
12.0
14.0
16.0
TEMPERATURE (C)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 475 DATE 11 Feb 2002 0447
LAT 33°31.7N LONG 117°53.9W
0.
100.
200.
300.
400.
500.
dep
6.0
8.0
10.0
12.0
14.0
16.0
TEMPERATURE (C)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 476 DATE 11 Feb 2002 0526
LAT 33°32.7N LONG 117°53.9W
0.
100.
200.
300.
400.
dep
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
TEMPERATURE (C)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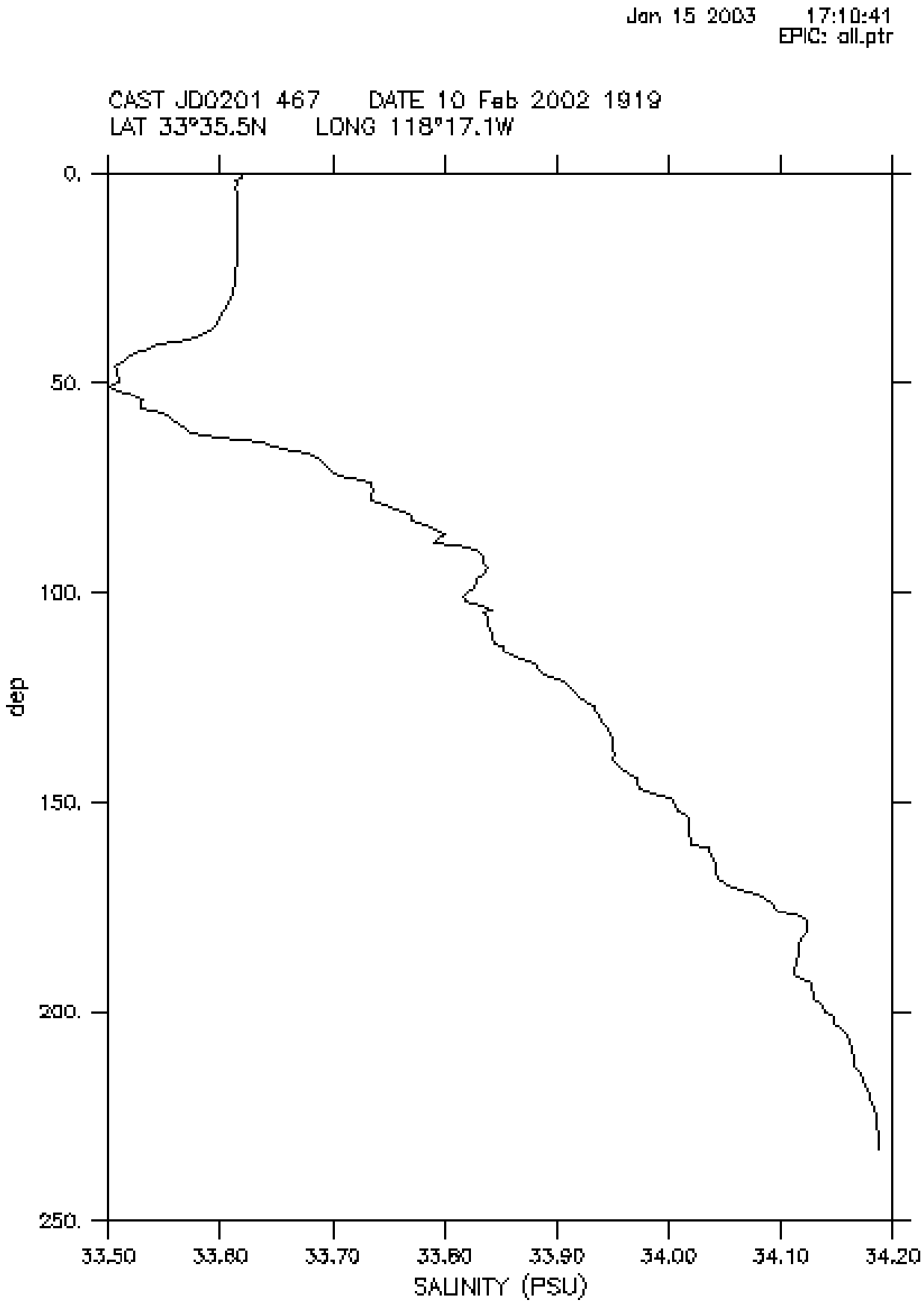
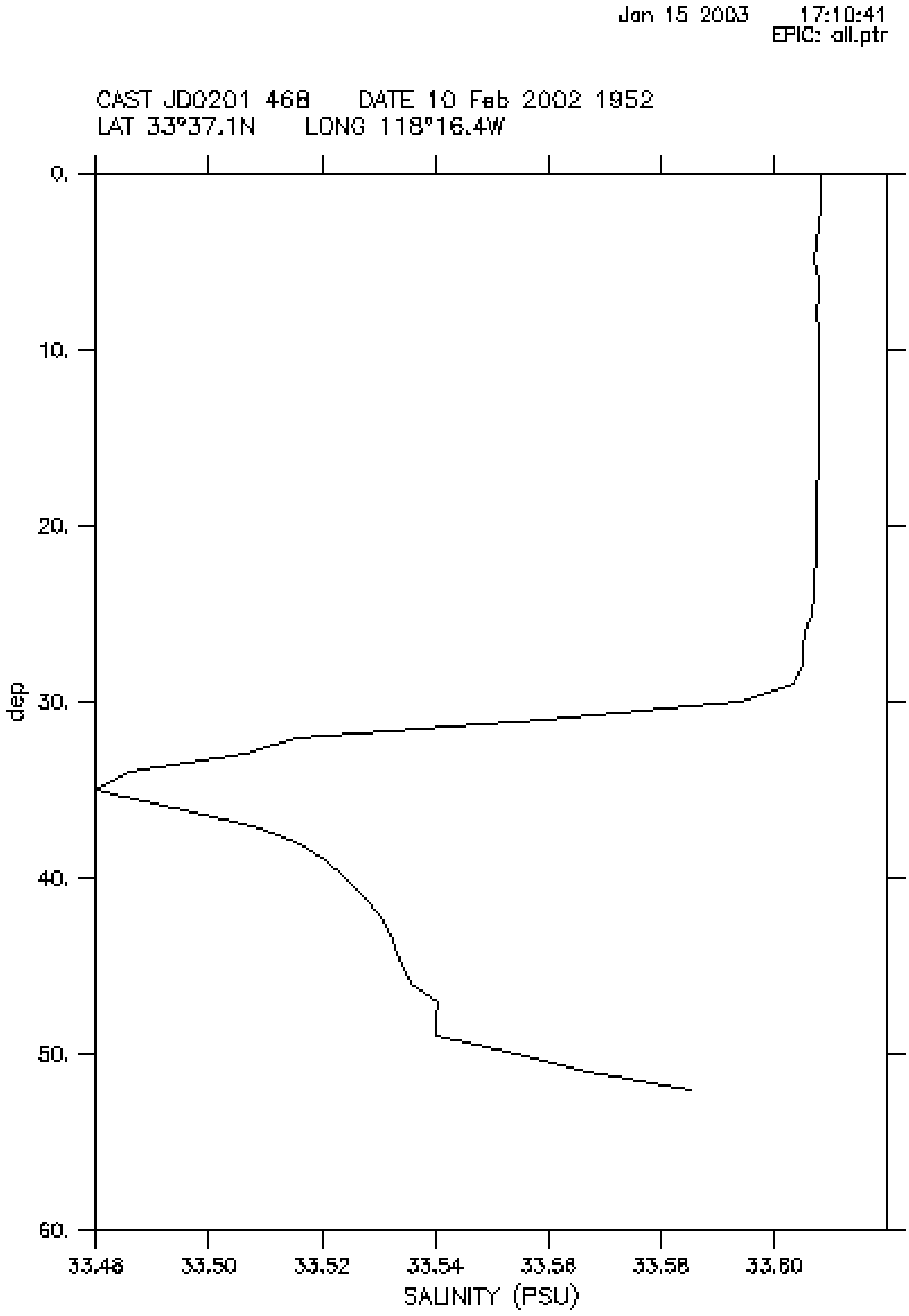
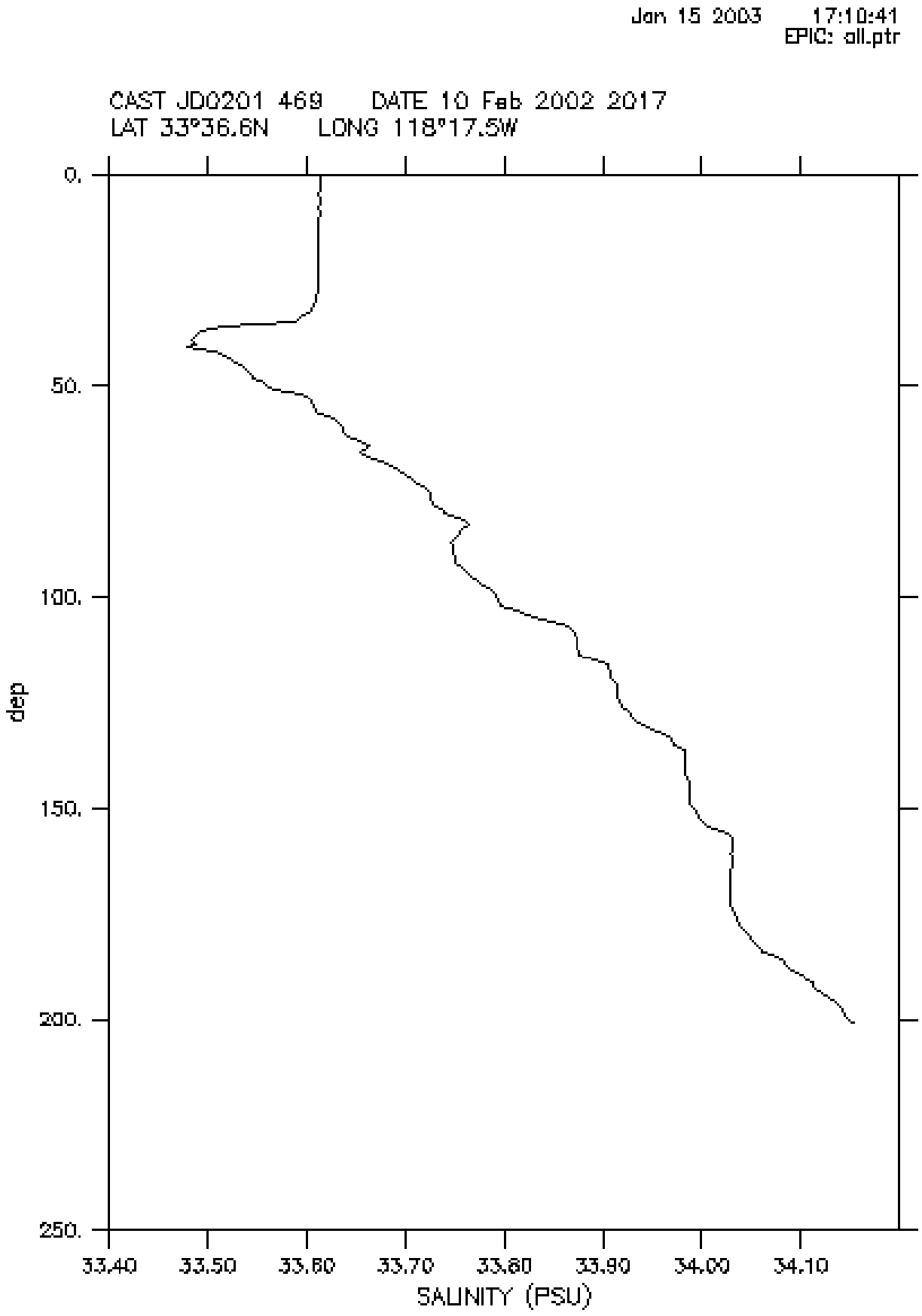
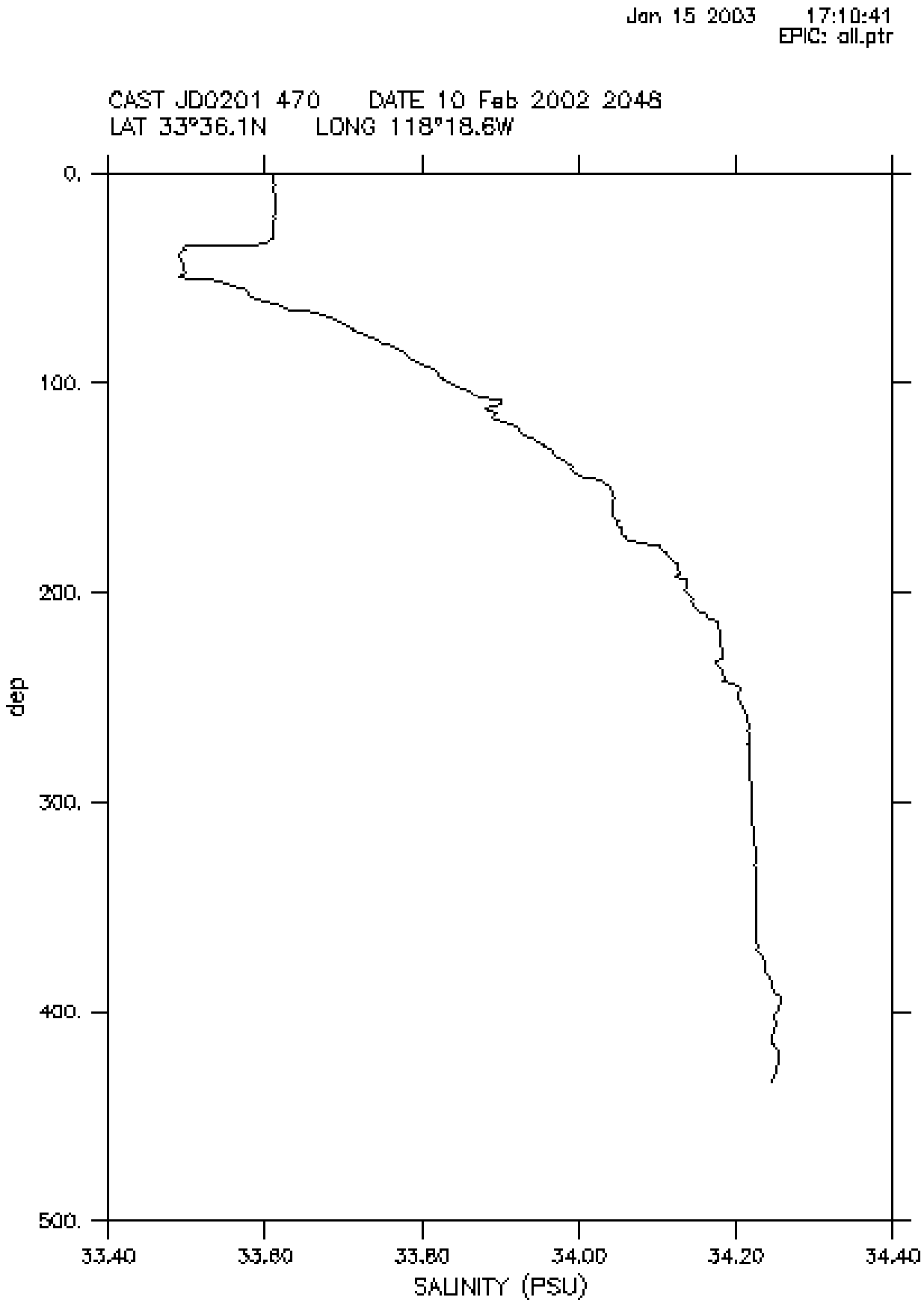
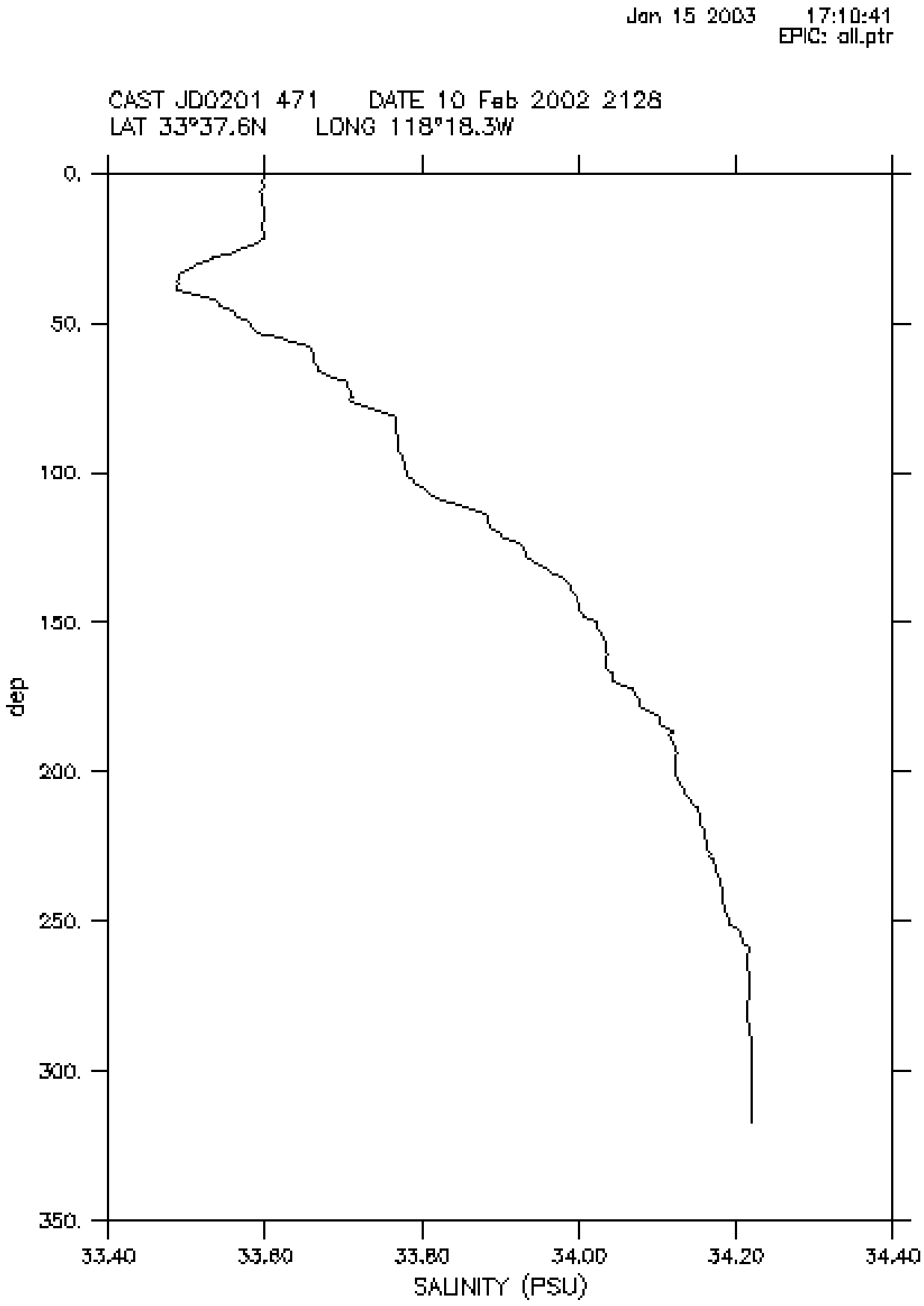
CAST JD0201 477 DATE 11 Feb 2002 0602
LAT 33°31.8N LONG 117°55.2W
0.
100.
200.
300.
400.
500.
dep
6.0
8.0
10.0
12.0
14.0
16.0
TEMPERATURE (C)

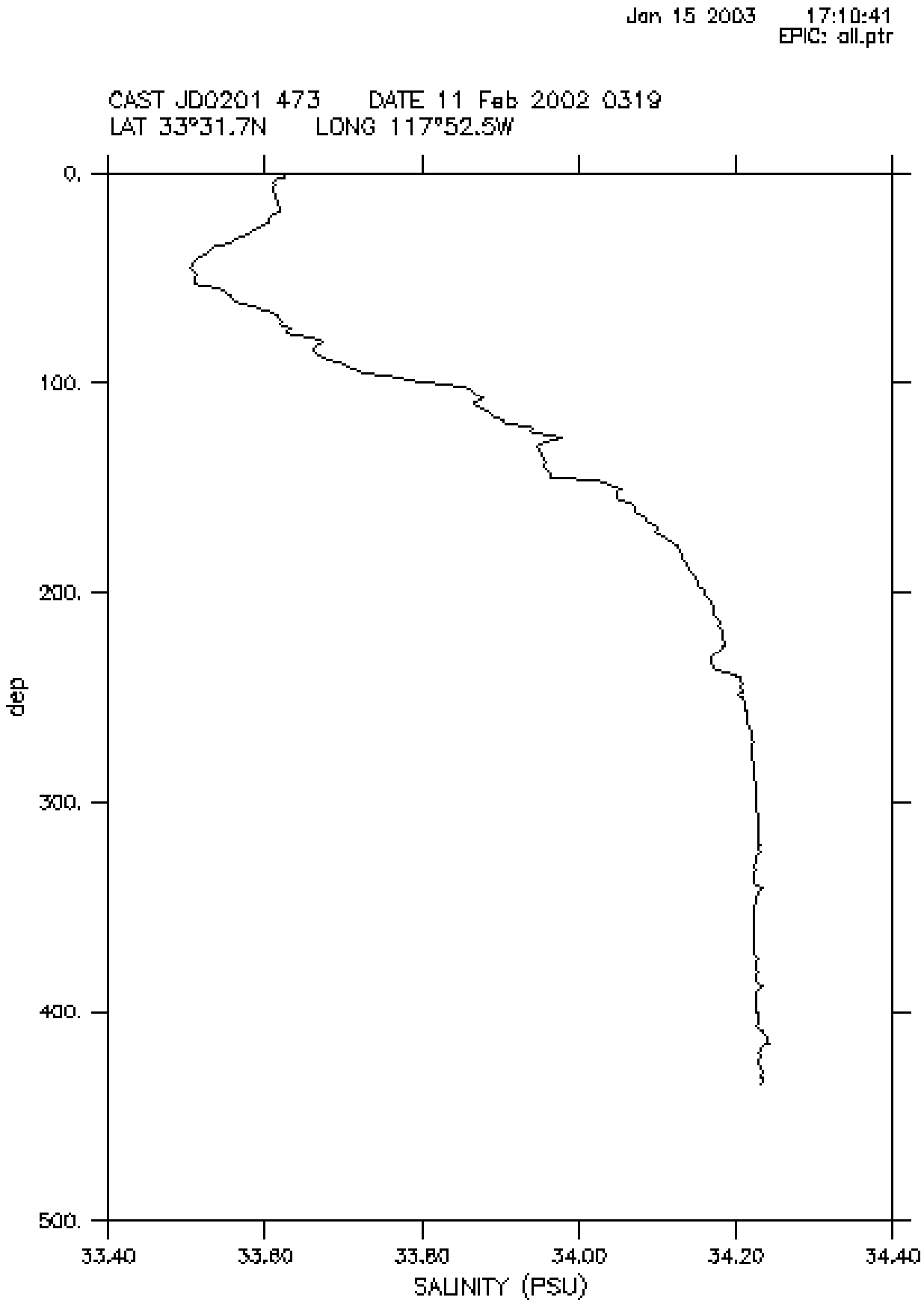

Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 467 DATE 10 Feb 2002 1919
LAT 33°35.5N LONG 118°17.1W
0.
50.
100.
150.
200.
250.
dep
33.50
33.60
33.70
33.80
33.90
34.00
34.10
34.20
SALINITY (PSU)

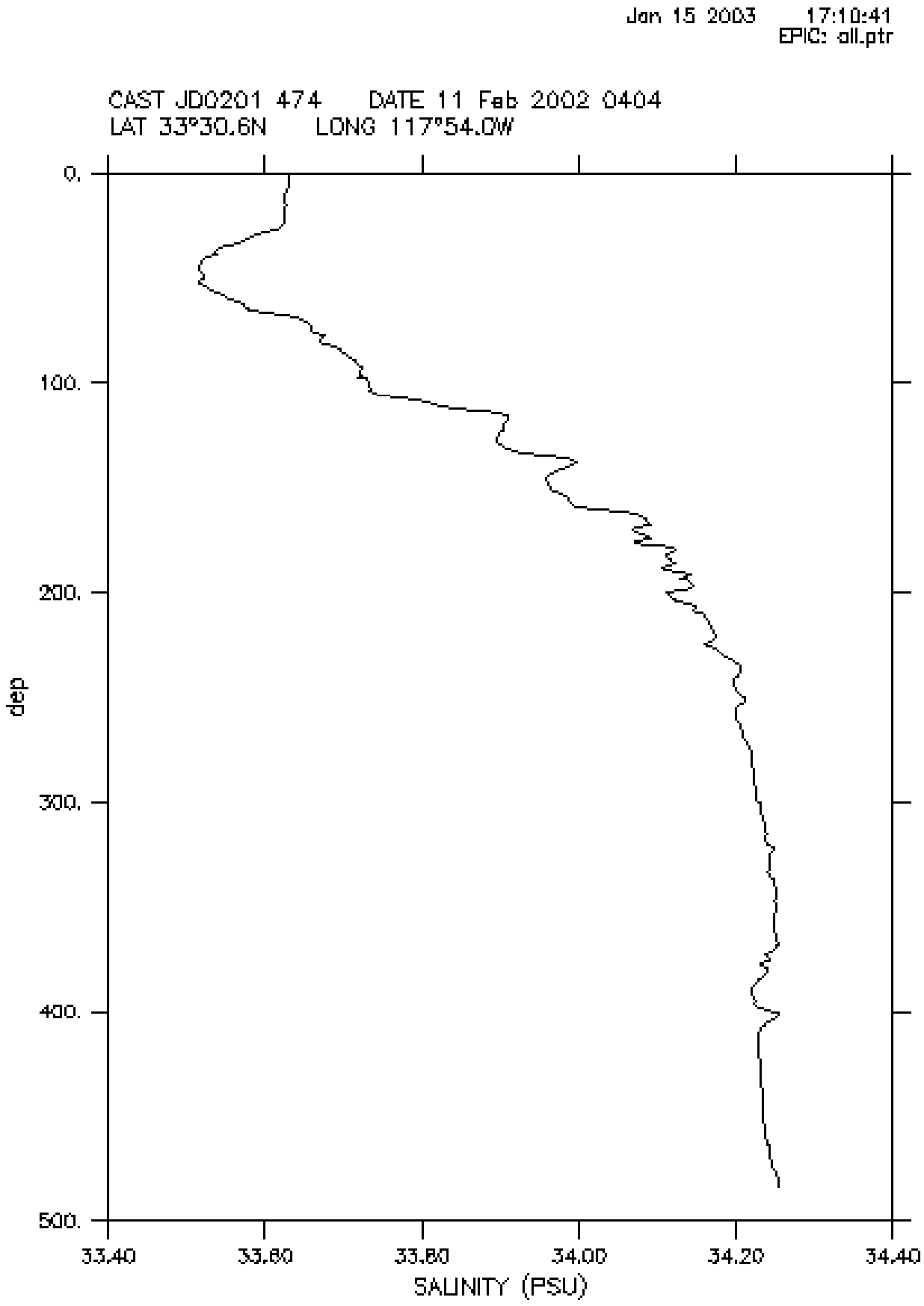

Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 468 DATE 10 Feb 2002 1952
LAT 33°37.1N LONG 118°16.4W
0.
10.
20.
30.
40.
50.
60.
dep
33.48
33.50
33.52
33.54
33.56
33.58
33.60
SALINITY (PSU)

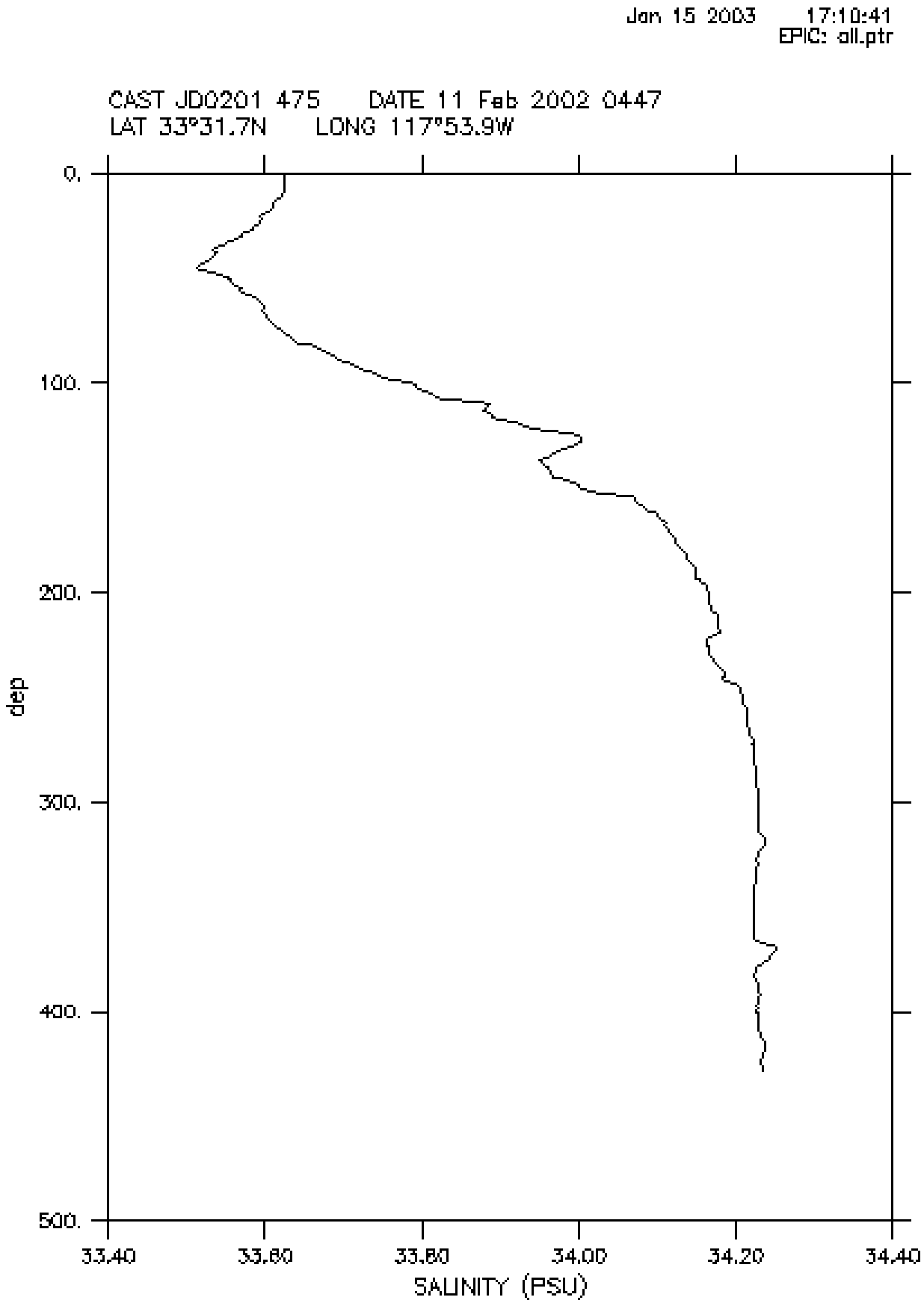

Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 469 DATE 10 Feb 2002 2017
LAT 33°36.6N LONG 118°17.5W
0.
50.
100.
150.
200.
250.
dep
33.40
33.50
33.60
33.70
33.80
33.90
34.00
34.10
SALINITY (PSU)

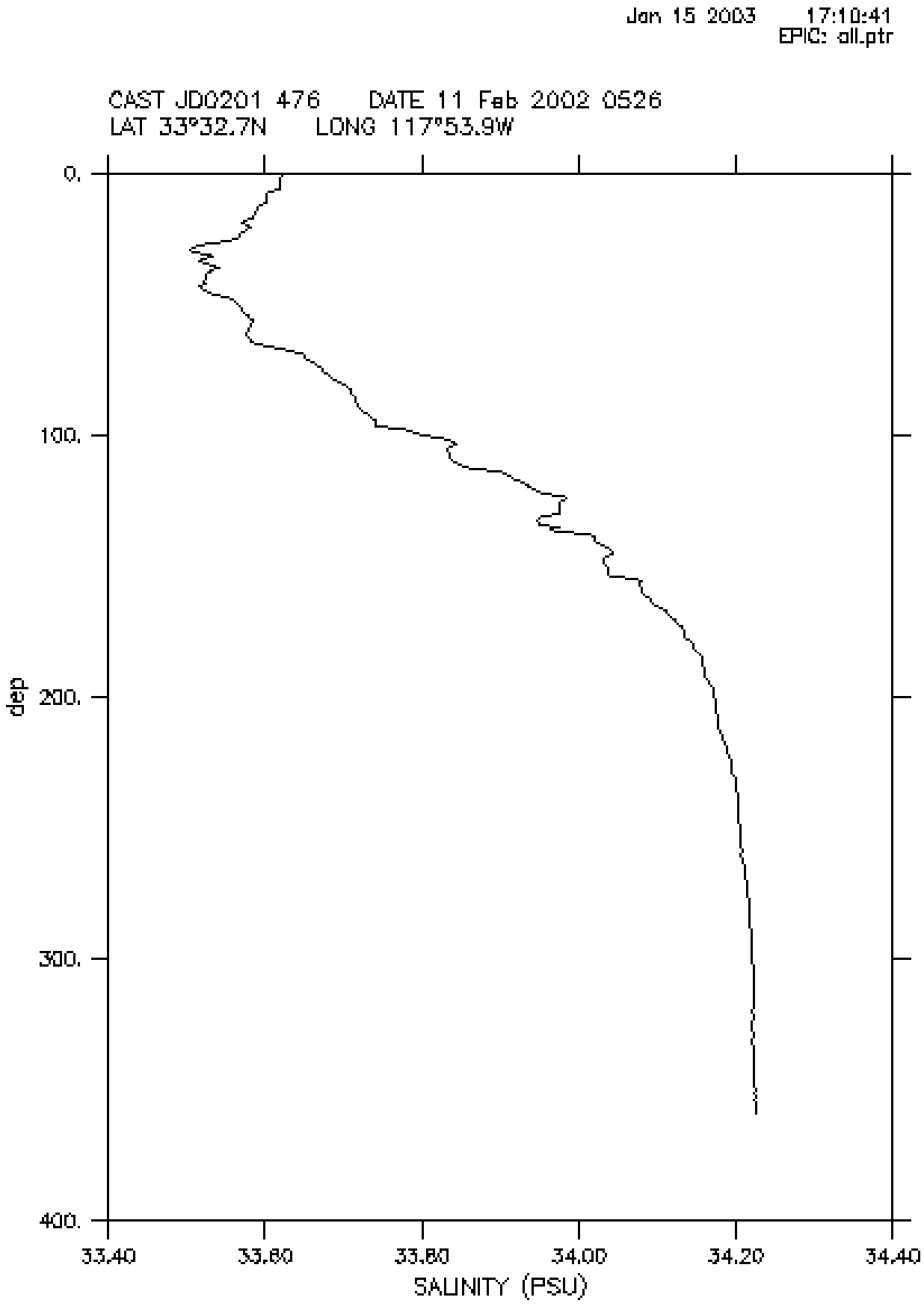

Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 470 DATE 10 Feb 2002 2048
LAT 33°36.1N LONG 118°18.6W
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)

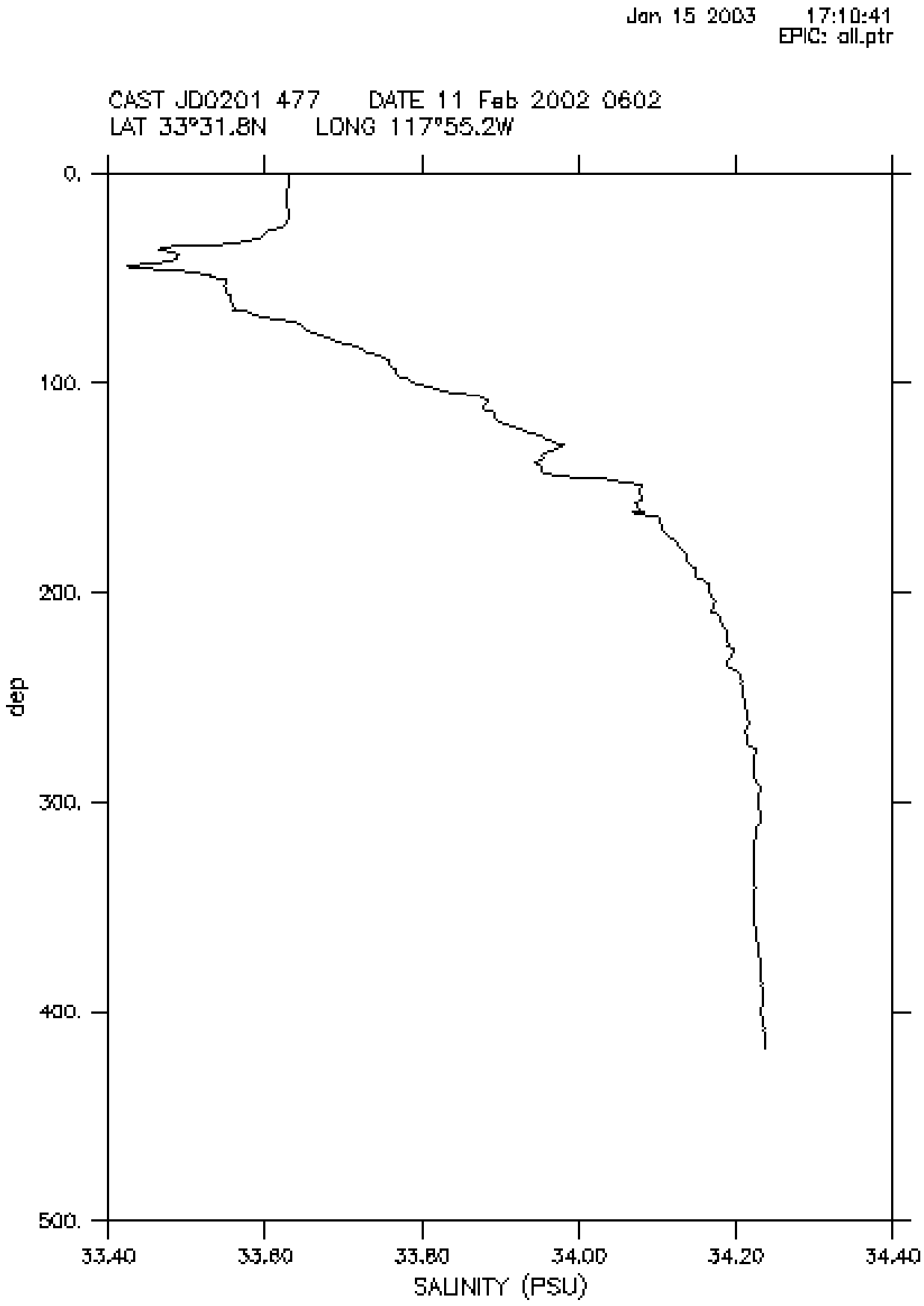

Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 471 DATE 10 Feb 2002 2128
LAT 33°37.6N LONG 118°18.3W
0.
50.
100.
150.
200.
250.
300.
350.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 473 DATE 11 Feb 2002 0319
LAT 33°31.7N LONG 117°52.5W
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 474 DATE 11 Feb 2002 0404
LAT 33°30.6N LONG 117°54.0W
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 475 DATE 11 Feb 2002 0447
LAT 33°31.7N LONG 117°53.9W
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 476 DATE 11 Feb 2002 0526
LAT 33°32.7N LONG 117°53.9W
0.
100.
200.
300.
400.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)


Jan 15 2003 17:10:41
EPIC: all.ptr
CAST JD0201 477 DATE 11 Feb 2002 0602
LAT 33°31.8N LONG 117°55.2W
0.
100.
200.
300.
400.
500.
dep
33.40
33.60
33.80
34.00
34.20
34.40
SALINITY (PSU)

Appendix 2. ADCP Data Plots

Time series of low-pass filtered (35-hr Lanczos), unrotated (up-pointing vector is northward flow) current velocity (cm s^{-1}) from moored Acoustic Doppler Current Profiler (ADCP) versus depth (8- or 10-m bins); no data for Site 3 from Sep 2000-Nov 2000.

A2-2 through A2-5: Site 2, deployment 1 (Jun 2000-Aug 2000)

A2-6 through A2-9: Site 2, deployment 2 (Aug 2000-Nov 2000)

A2-10 through A2-13: Site 2, deployment 3 (Nov 2000-Jan 2001)

A2-14 through A2-17: Site 2, deployment 4 (Jan 2001-Jun 2001)

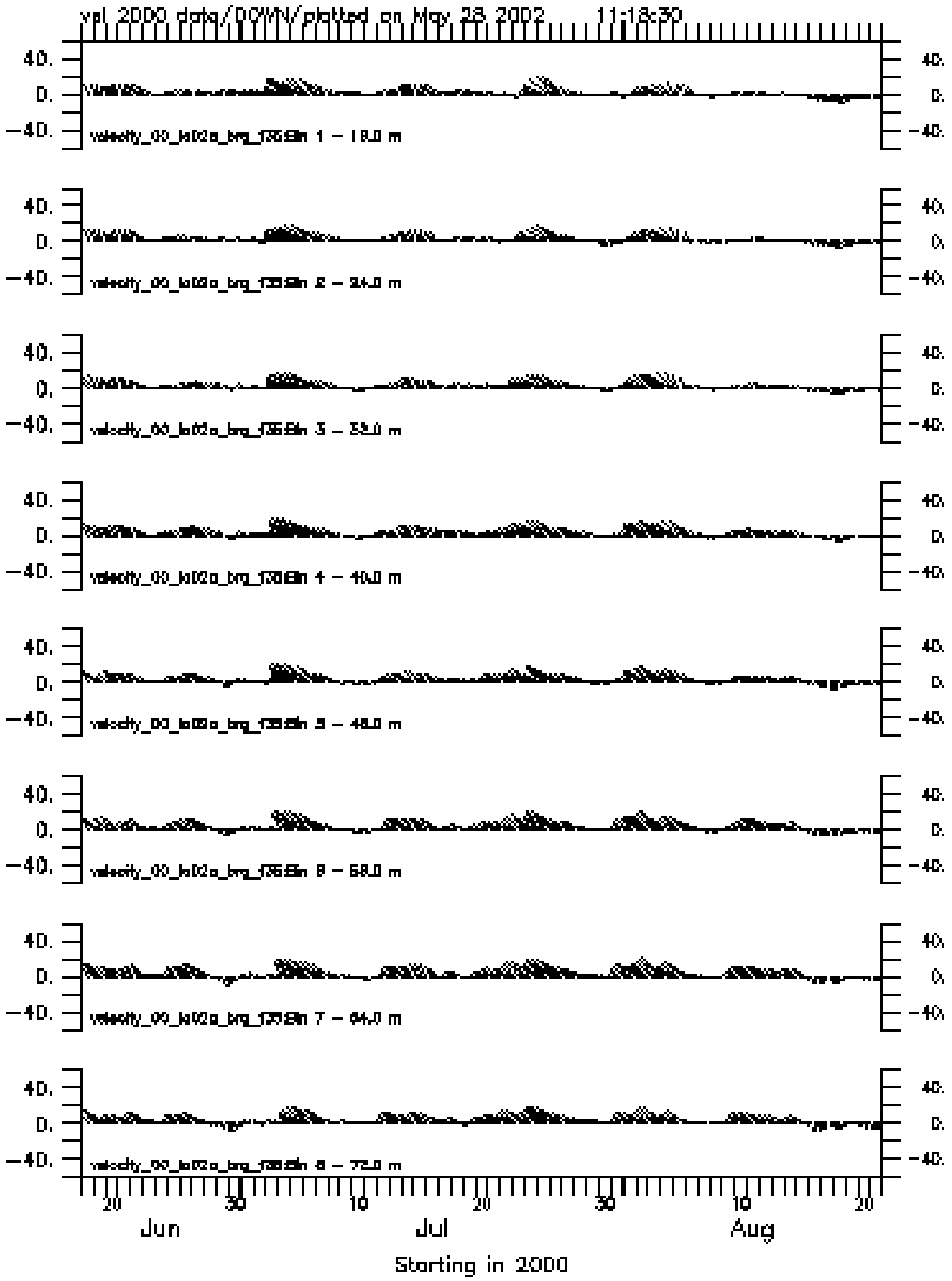
A2-18 through A2-20: Site 2, deployment 5 (Jun 2001-Nov 2001)

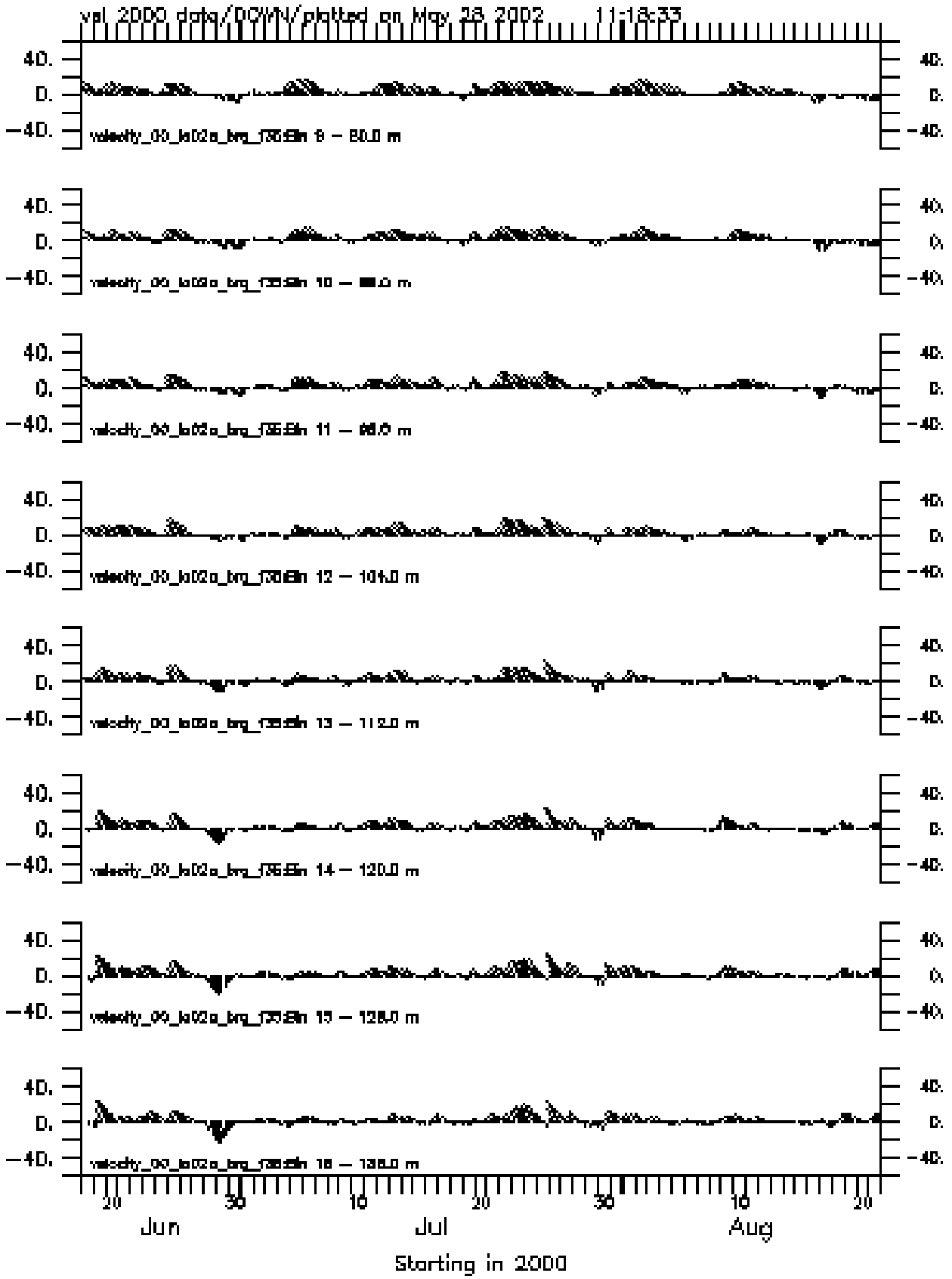
A2-21 through A2-27: Site 3, deployment 1 (Jun 2000-Sep 2000)

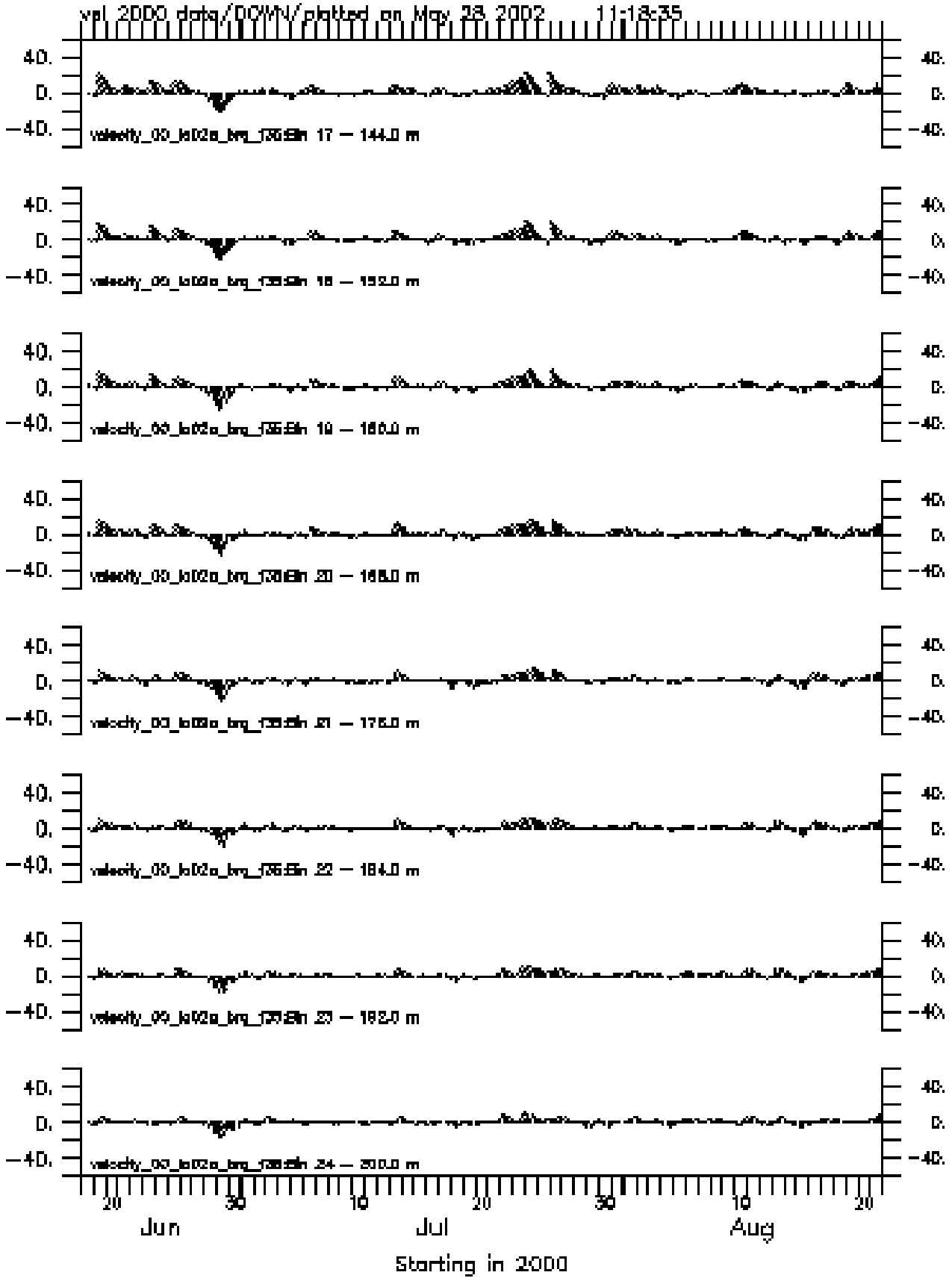
A2-28 through A2-33: Site 3, deployment 3 (Nov 2000-Jan 2001)

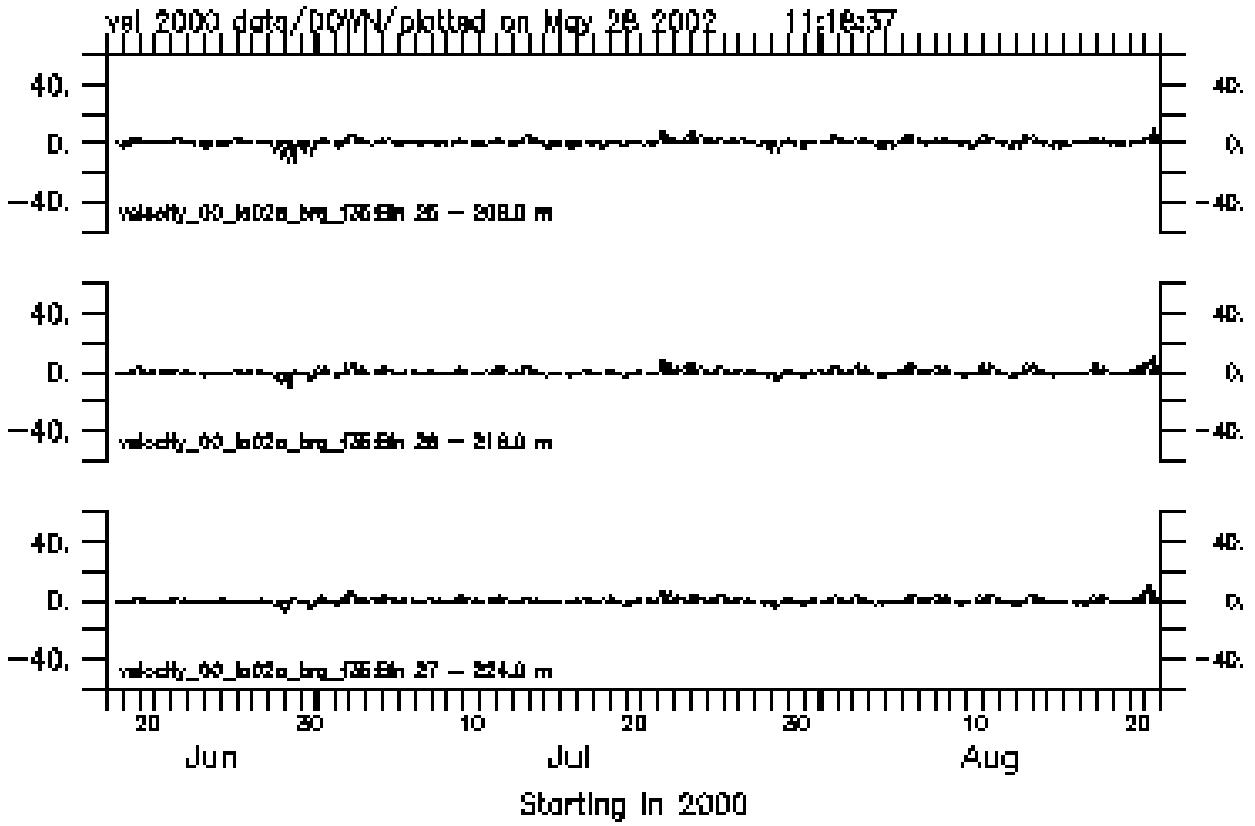
A2-34 through A2-39: Site 3, deployment 4 (Jan 2001-Jun 2001)

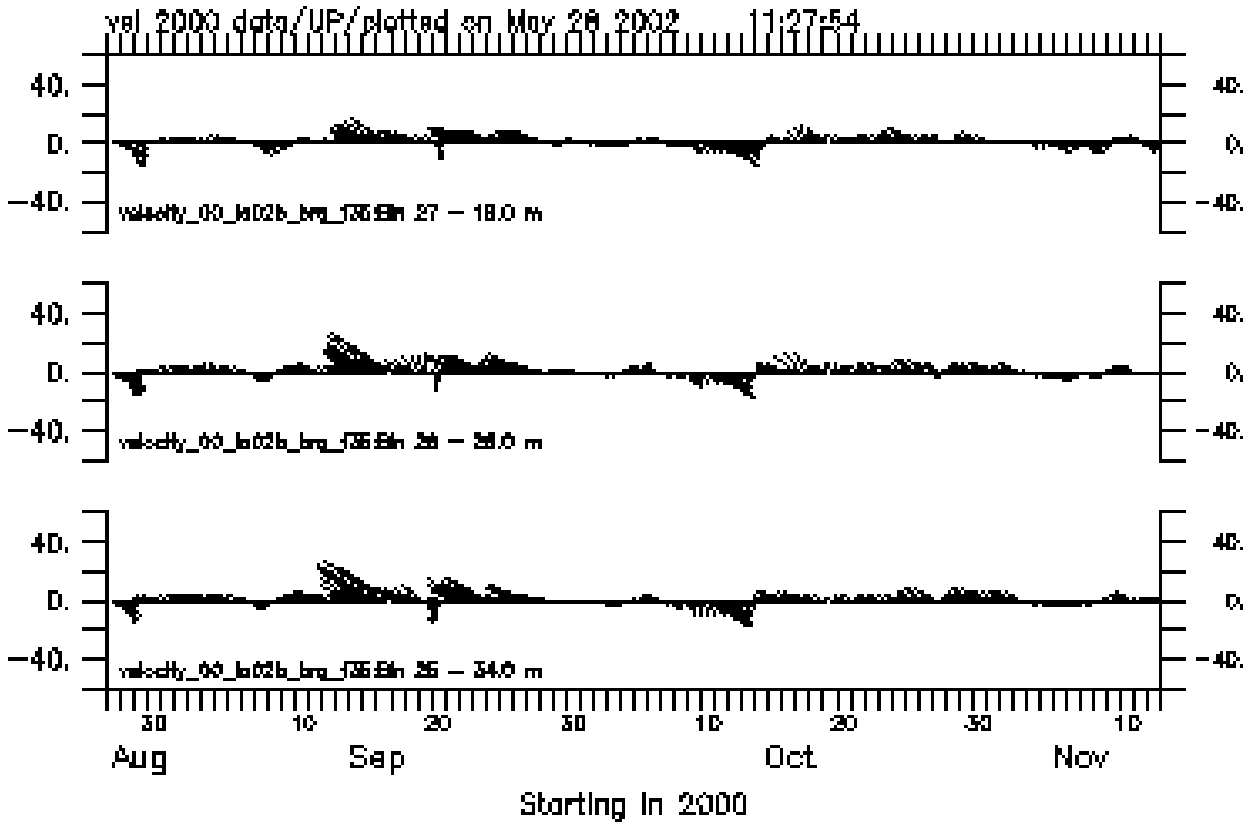
A2-40 through A2-42: Site 3, deployment 5 (Jun 2001-Nov 2001)

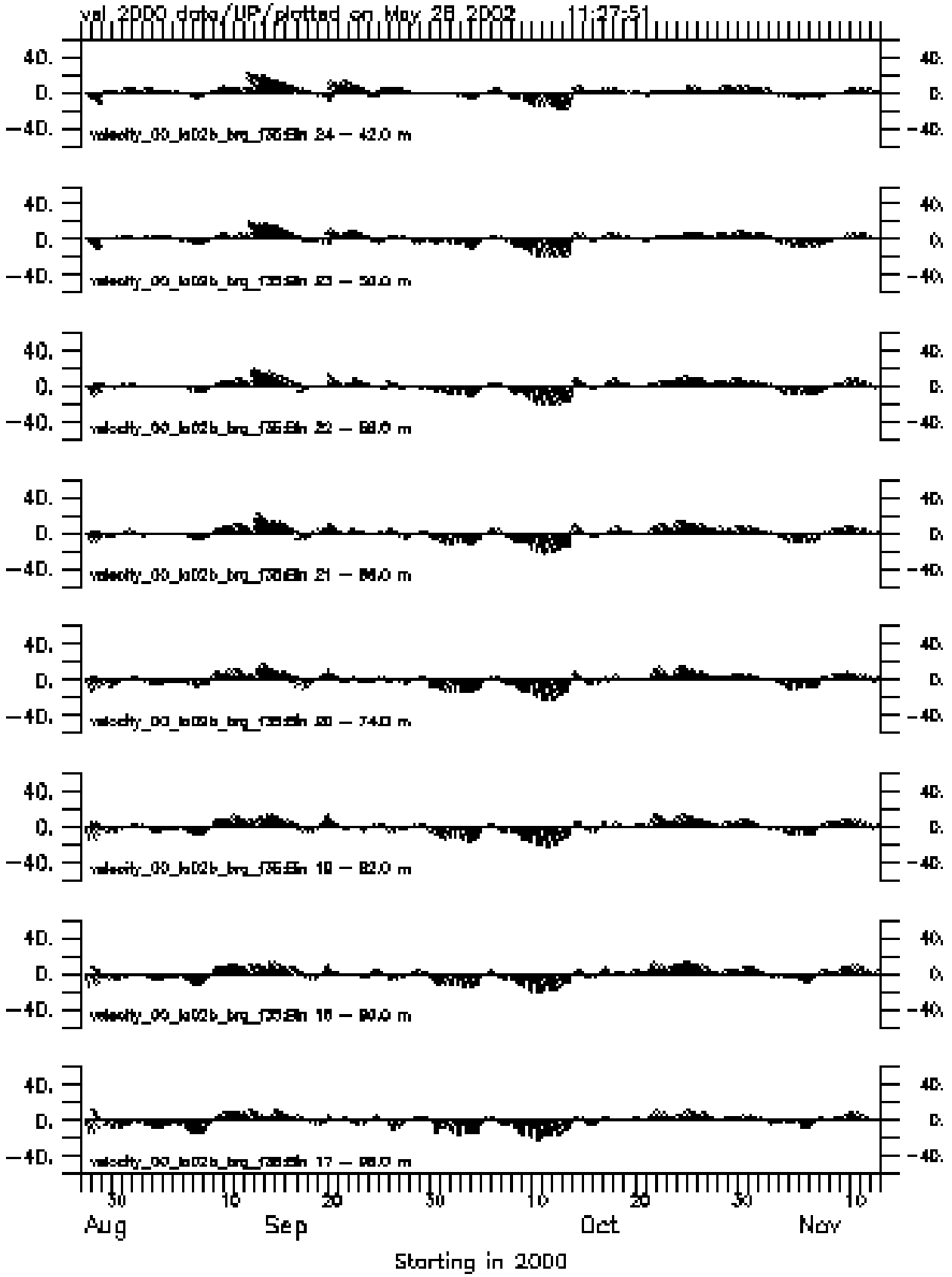

val 2000 data/DCWN/plotted on May 28, 2002 11:18:30
40.
0.
-40.
velocity_00_ja02a_brq_f36f8n 1 – 18.0 m
velocity_00_ja02a_brq_f36f8n 2 – 24.0 m
velocity_00_ja02a_brq_f36f8n 3 – 32.0 m
velocity_00_ja02a_brq_f36f8n 4 – 40.0 m
velocity_00_ja02a_brq_f36f8n 5 – 48.0 m
velocity_00_ja02a_brq_f36f8n 6 – 56.0 m
velocity_00_ja02a_brq_f36f8n 7 – 64.0 m
velocity_00_ja02a_brq_f36f8n 8 – 72.0 m
20
30
10
20
30
10
20
Jun
Jul
Aug
Starting in 2000

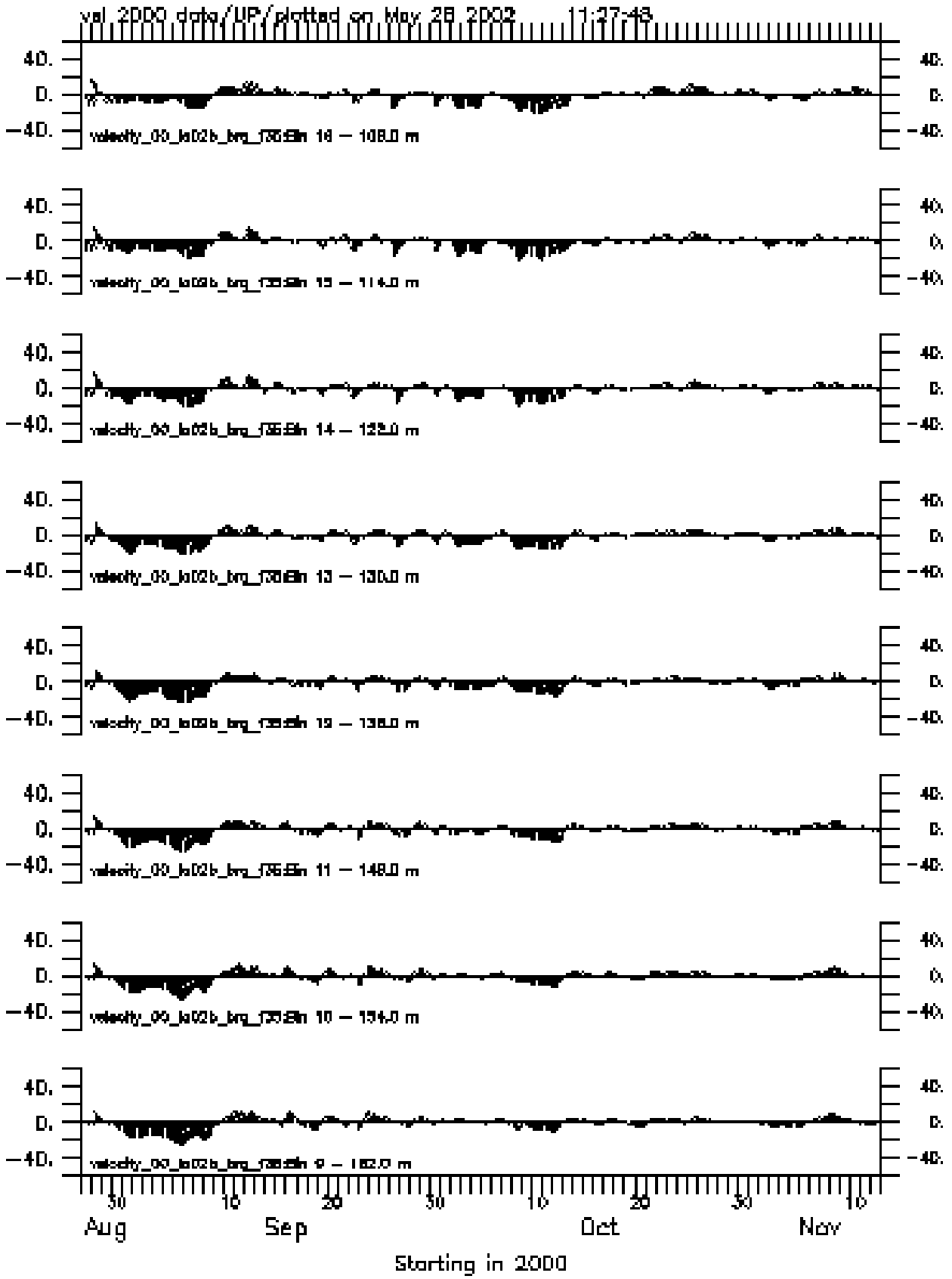

val 2000 data/DCWN/plotted on May 28 2002 11:18:33
40.
0.
-40.
velocity_00_ja02a_brg_f365in 9 — 80.0 m
velocity_00_ja02a_brg_f365in 10 — 88.0 m
velocity_00_ja02a_brg_f365in 11 — 96.0 m
velocity_00_ja02a_brg_f365in 12 — 104.0 m
velocity_00_ja02a_brg_f365in 13 — 112.0 m
velocity_00_ja02a_brg_f365in 14 — 120.0 m
velocity_00_ja02a_brg_f365in 15 — 128.0 m
velocity_00_ja02a_brg_f365in 16 — 136.0 m
20
30
10
20
30
10
20
Jun
Jul
Aug
Starting in 2000

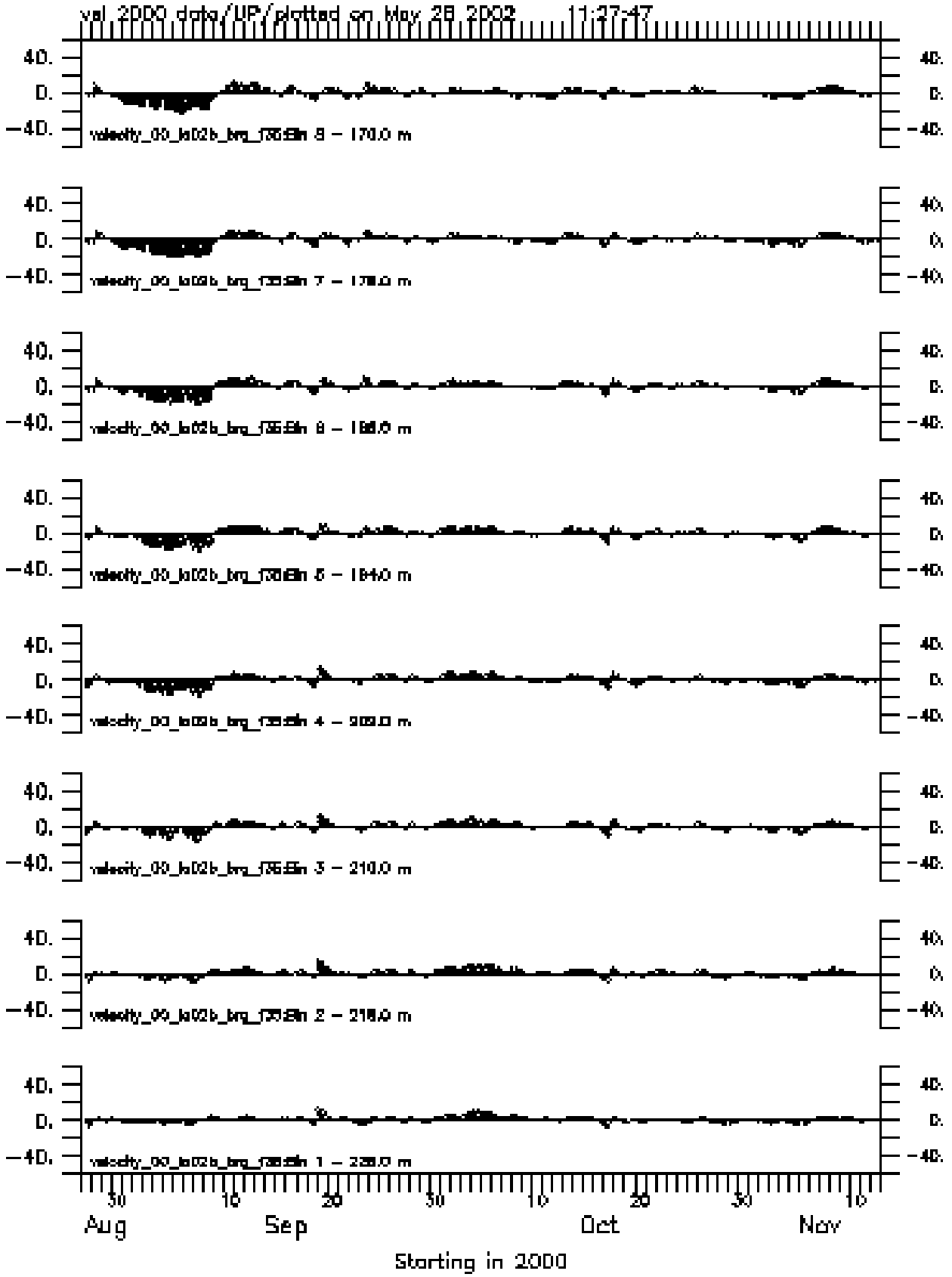

vel 2000 data/DOWN/plotted on May 28 2002 11:18:35
40.
0.
-40.
velocity_03_ja02a_brq_f35:Bin 17 — 144.0 m
velocity_03_ja02a_brq_f35:Bin 18 — 152.0 m
velocity_03_ja02a_brq_f35:Bin 19 — 160.0 m
velocity_03_ja02a_brq_f35:Bin 20 — 168.0 m
velocity_03_ja02a_brq_f35:Bin 21 — 176.0 m
velocity_03_ja02a_brq_f35:Bin 22 — 184.0 m
velocity_03_ja02a_brq_f35:Bin 23 — 192.0 m
velocity_03_ja02a_brq_f35:Bin 24 — 200.0 m
20
30
10
20
30
10
20
Jun
Jul
Aug
Starting in 2000

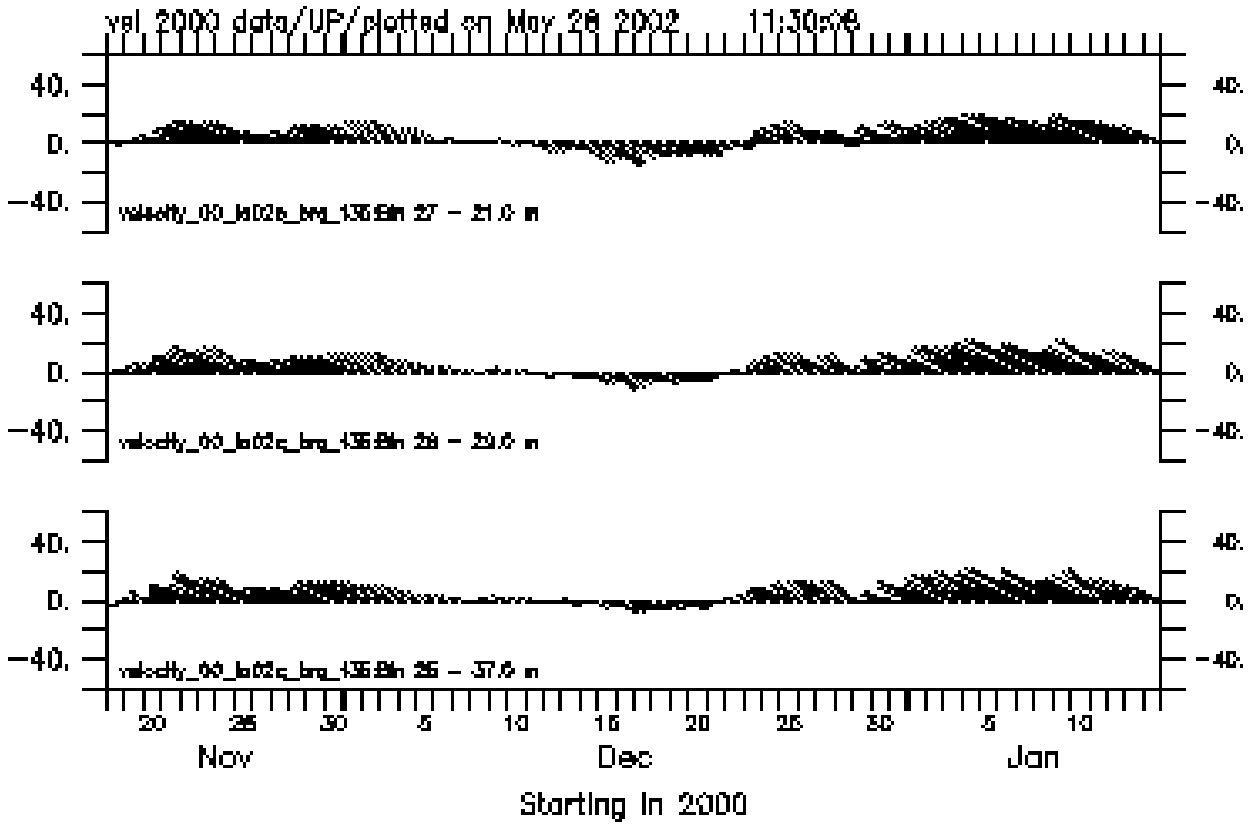

vel 2000 data/DOWN/plotted on May 29 2002 11:16:37
40.
0.
-40.
velocity_00_la02a_brg_f356bin 25 – 208.0 m
velocity_00_la02a_brg_f356bin 26 – 216.0 m
velocity_00_la02a_brg_f356bin 27 – 224.0 m
20
30
10
20
30
10
20
Jun
Jul
Aug
Starting In 2000

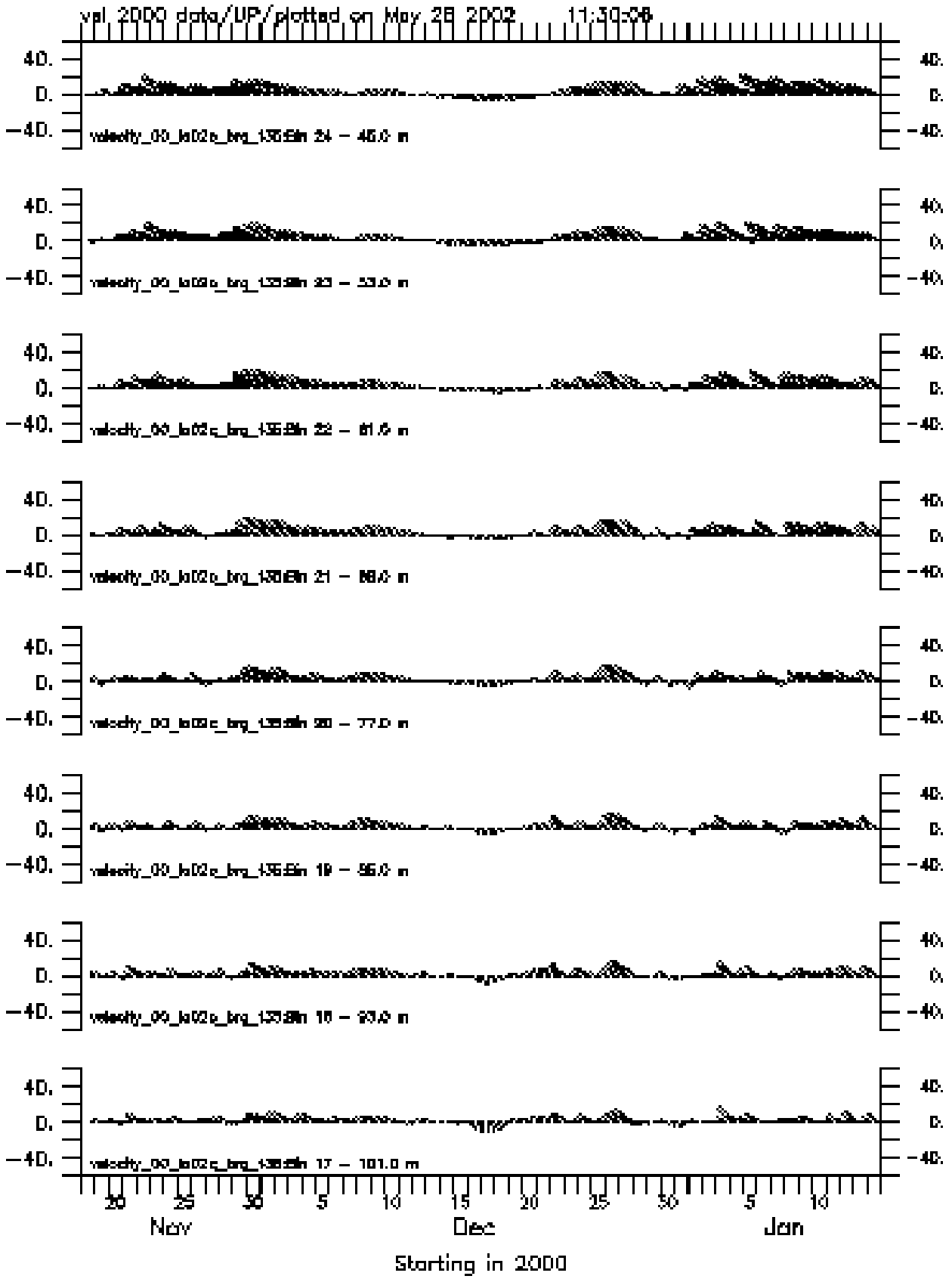

val 2000 data/UP/plotted on May 28 2002 11:27:54
40.
0.
-40.
velocity_00_la02b_brg_f35.8in 27 – 18.0 m
velocity_00_la02b_brg_f35.8in 26 – 26.0 m
velocity_00_la02b_brg_f35.8in 25 – 34.0 m
30
10
20
30
10
20
30
10
Aug
Sep
Oct
Nov
Starting In 2000

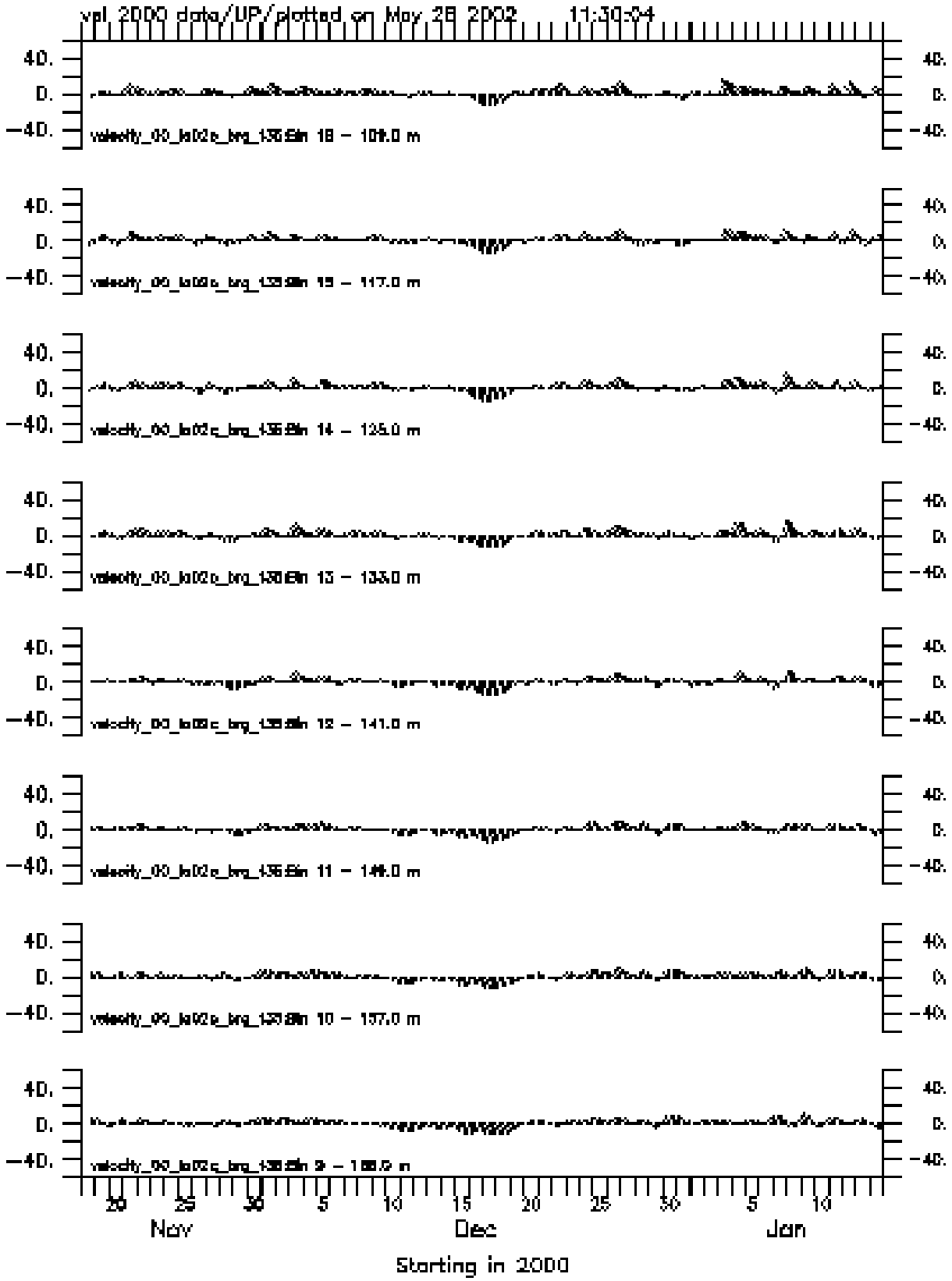

val 2000 data/UP/plotted on May 28 2002 11:27:51
40.
0.
-40.
velocity_00_ja02b_brg_f365lin 24 — 42.0 m
velocity_00_ja02b_brg_f365lin 23 — 50.0 m
velocity_00_ja02b_brg_f365lin 22 — 58.0 m
velocity_00_ja02b_brg_f365lin 21 — 66.0 m
velocity_00_ja02b_brg_f365lin 20 — 74.0 m
velocity_00_ja02b_brg_f365lin 19 — 82.0 m
velocity_00_ja02b_brg_f365lin 18 — 90.0 m
velocity_00_ja02b_brg_f365lin 17 — 98.0 m
30
10
20
30
10
20
30
10
Aug
Sep
Oct
Nov
Starting in 2000

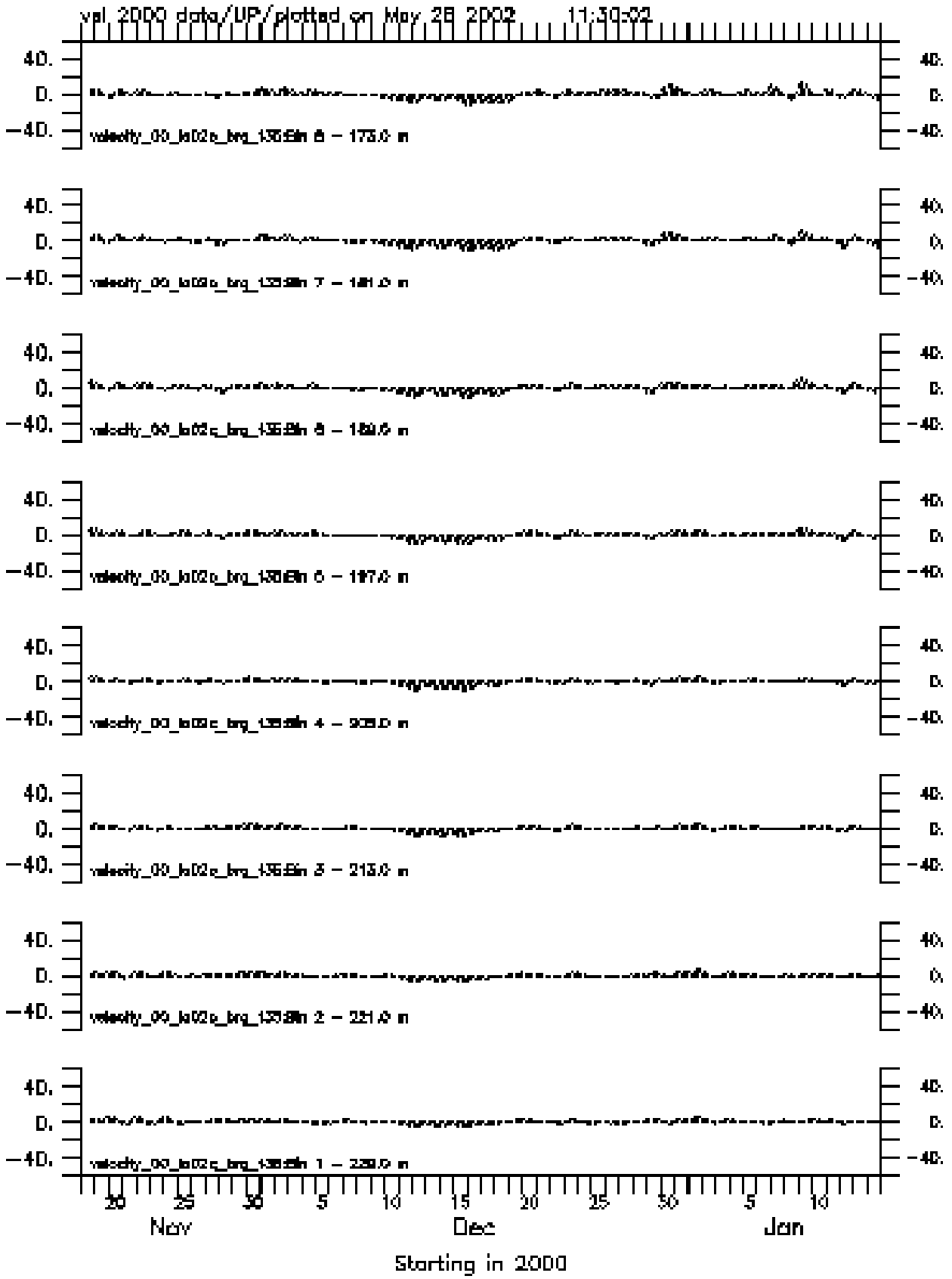

val 2000 data/UP/ plotted on May 28 2002 11:27:48
40.
0.
-40.
velocity_00_ja02b_brg_f365lin 16 — 108.0 m
velocity_00_ja02b_brg_f365lin 15 — 114.0 m
velocity_00_ja02b_brg_f365lin 14 — 122.0 m
velocity_00_ja02b_brg_f365lin 13 — 130.0 m
velocity_00_ja02b_brg_f365lin 12 — 138.0 m
velocity_00_ja02b_brg_f365lin 11 — 148.0 m
velocity_00_ja02b_brg_f365lin 10 — 156.0 m
velocity_00_ja02b_brg_f365lin 9 — 162.0 m
30
10
20
30
10
20
30
10
Aug
Sep
Oct
Nov
Starting in 2000

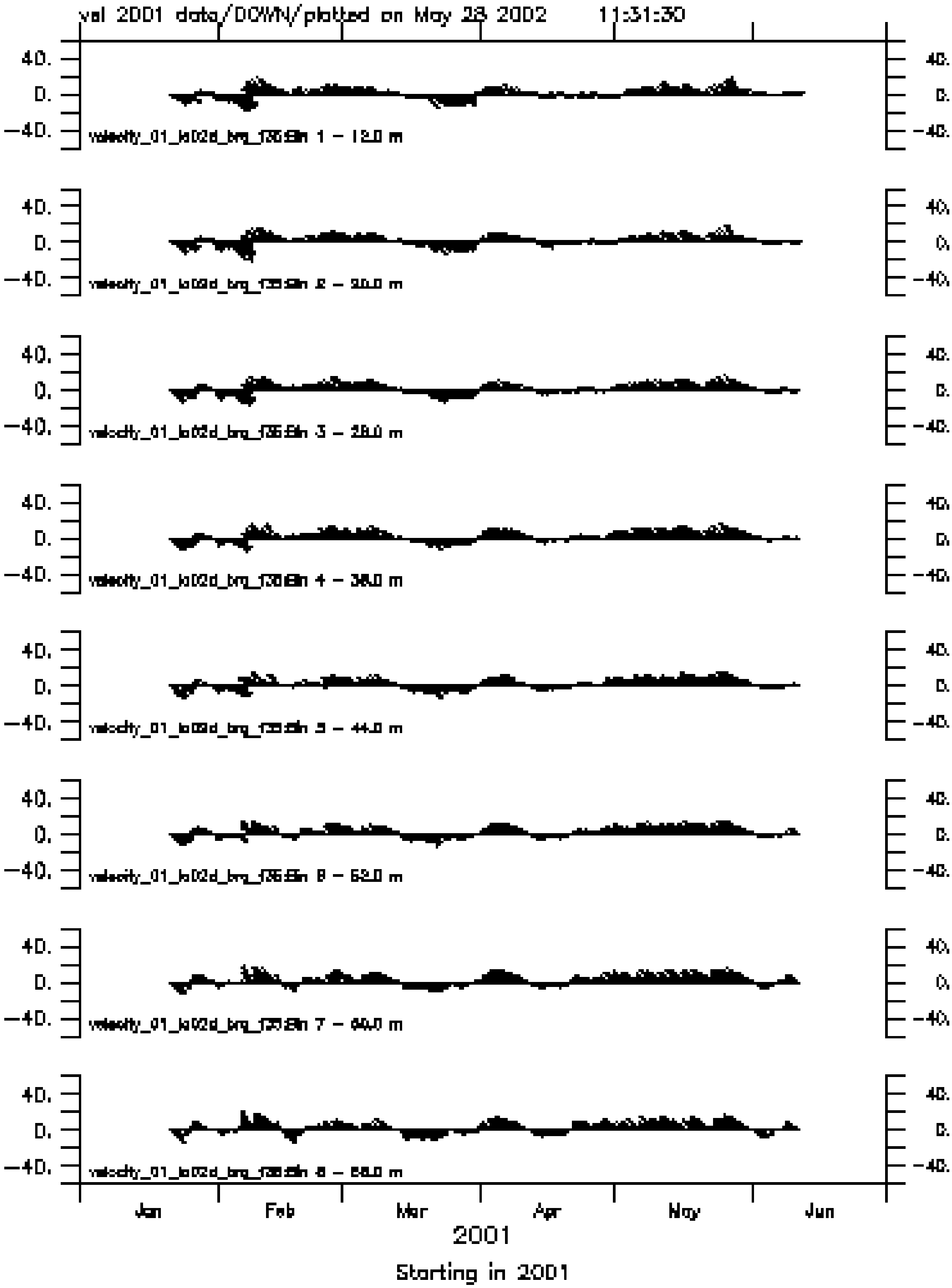

val 2000 data/UP/plotted on May 28 2002 11:27:47
40.
0.
-40.
velocity_00_ja02b_brg_f365lin 8 – 170.0 m
velocity_00_ja02b_brg_f365lin 7 – 178.0 m
velocity_00_ja02b_brg_f365lin 6 – 186.0 m
velocity_00_ja02b_brg_f365lin 5 – 194.0 m
velocity_00_ja02b_brg_f365lin 4 – 202.0 m
velocity_00_ja02b_brg_f365lin 3 – 210.0 m
velocity_00_ja02b_brg_f365lin 2 – 218.0 m
velocity_00_ja02b_brg_f365lin 1 – 226.0 m
30
10
20
30
10
20
30
10
Aug
Sep
Oct
Nov
Starting in 2000


vel 2000 data/UP/plotted on May 28 2002 11:30:08
40.
0.
-40.
Nov
Dec
Jan
Starting In 2000

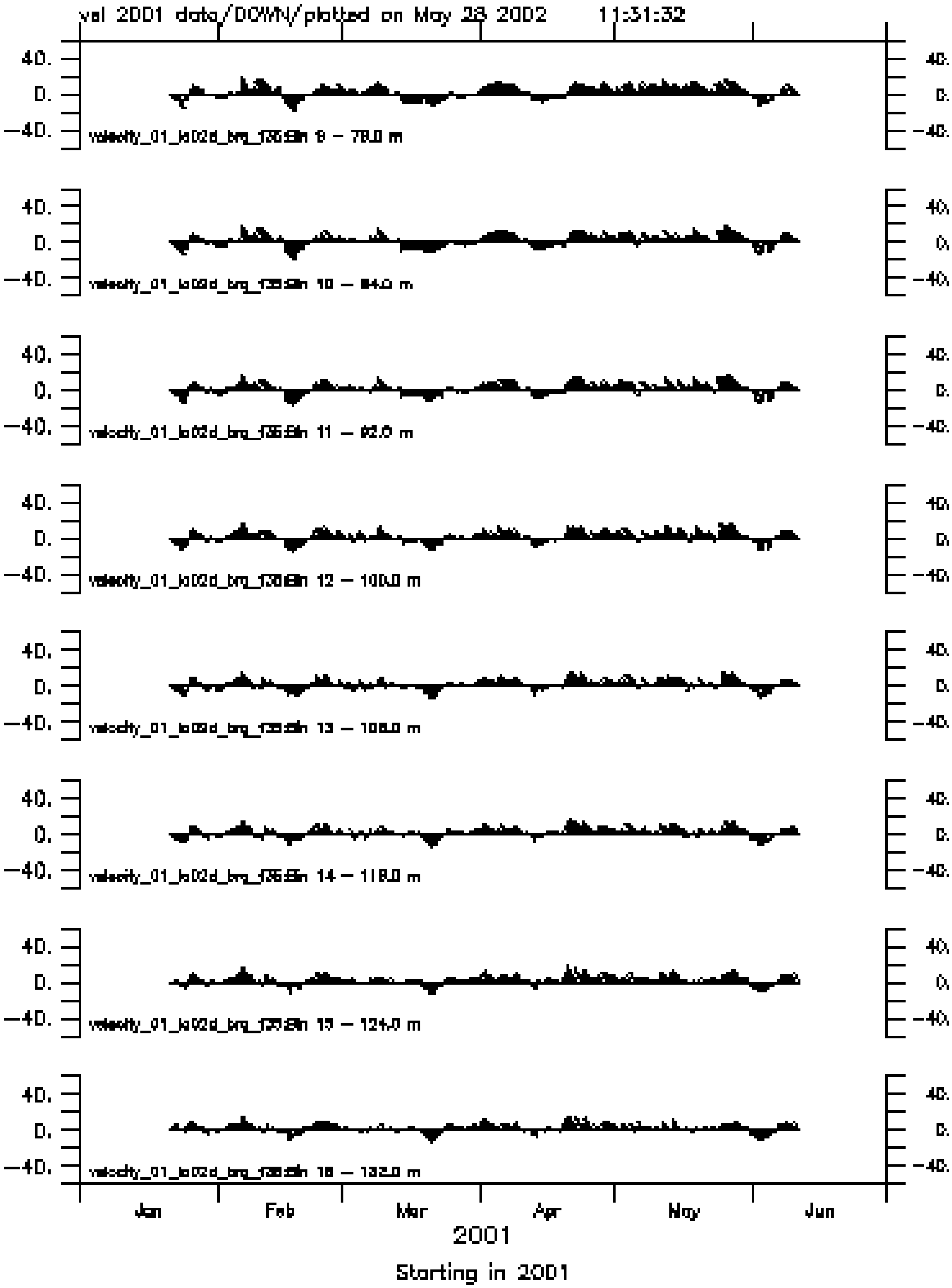

val_2000 data/UP/ plotted on May 28 2002 11:30:36
40.
0.
-40.
velocity_00_ja02c_brg_1355in 24 – 46.0 m
velocity_00_ja02c_brg_1355in 23 – 53.0 m
velocity_00_ja02c_brg_1355in 22 – 61.0 m
velocity_00_ja02c_brg_1355in 21 – 69.0 m
velocity_00_ja02c_brg_1355in 20 – 77.0 m
velocity_00_ja02c_brg_1355in 19 – 85.0 m
velocity_00_ja02c_brg_1355in 18 – 93.0 m
velocity_00_ja02c_brg_1355in 17 – 101.0 m
20 25 30 5 10 15 20 25 30 5 10
Nov
Dec
Jan
Starting in 2000

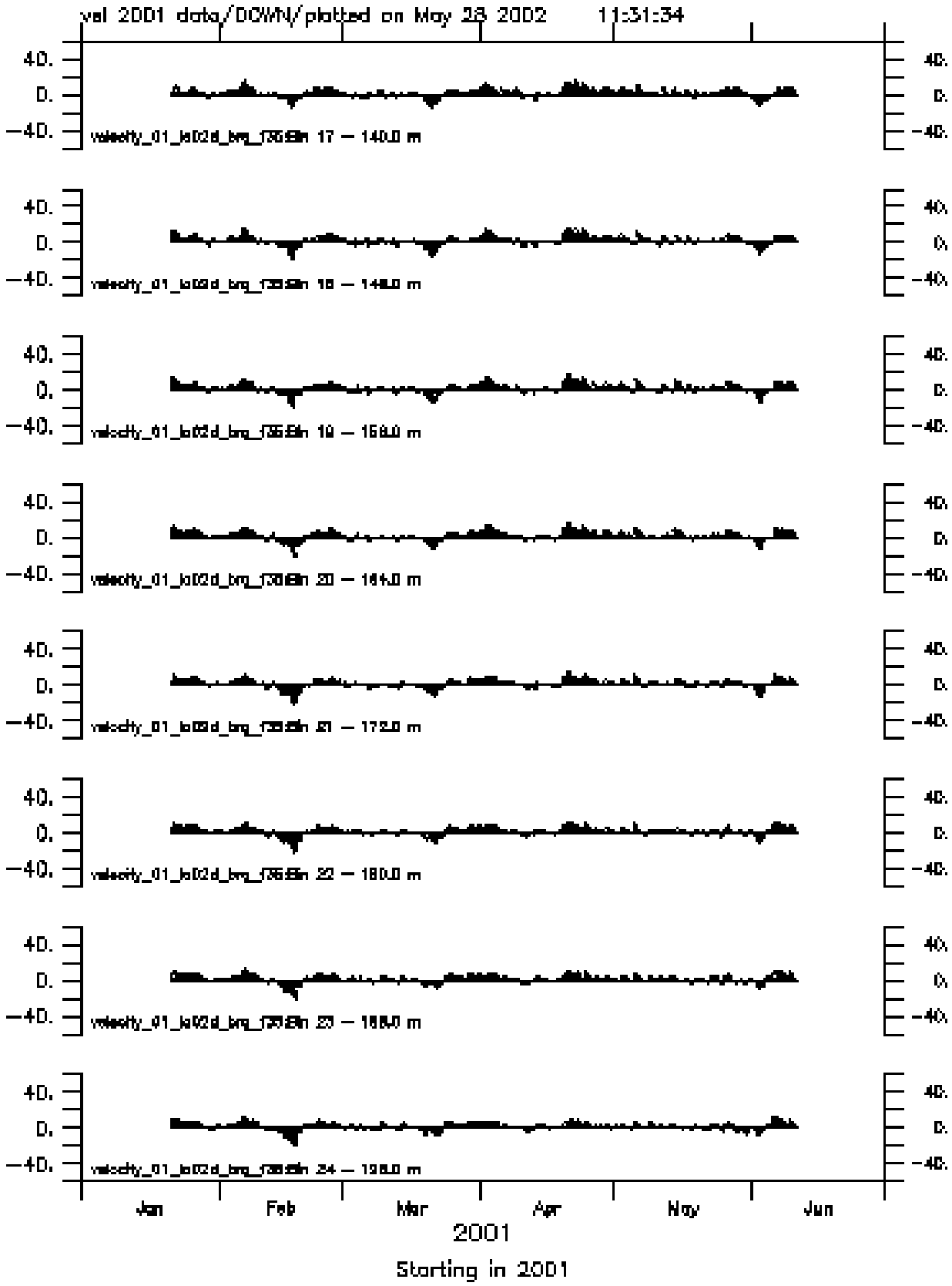

vel 2000 data/UP/plotted on May 28 2002 11:30:04
40.
0.
-40.
velocity_00_ja02c_brg_135.6in 18 – 109.0 m
velocity_00_ja02c_brg_135.6in 15 – 117.0 m
velocity_00_ja02c_brg_135.6in 14 – 125.0 m
velocity_00_ja02c_brg_135.6in 13 – 133.0 m
velocity_00_ja02c_brg_135.6in 12 – 141.0 m
velocity_00_ja02c_brg_135.6in 11 – 149.0 m
velocity_00_ja02c_brg_135.6in 10 – 157.0 m
velocity_00_ja02c_brg_135.6in 9 – 165.0 m
20
25
30
5
10
15
20
25
30
5
10
Nov
Dec
Jan
Starting in 2000

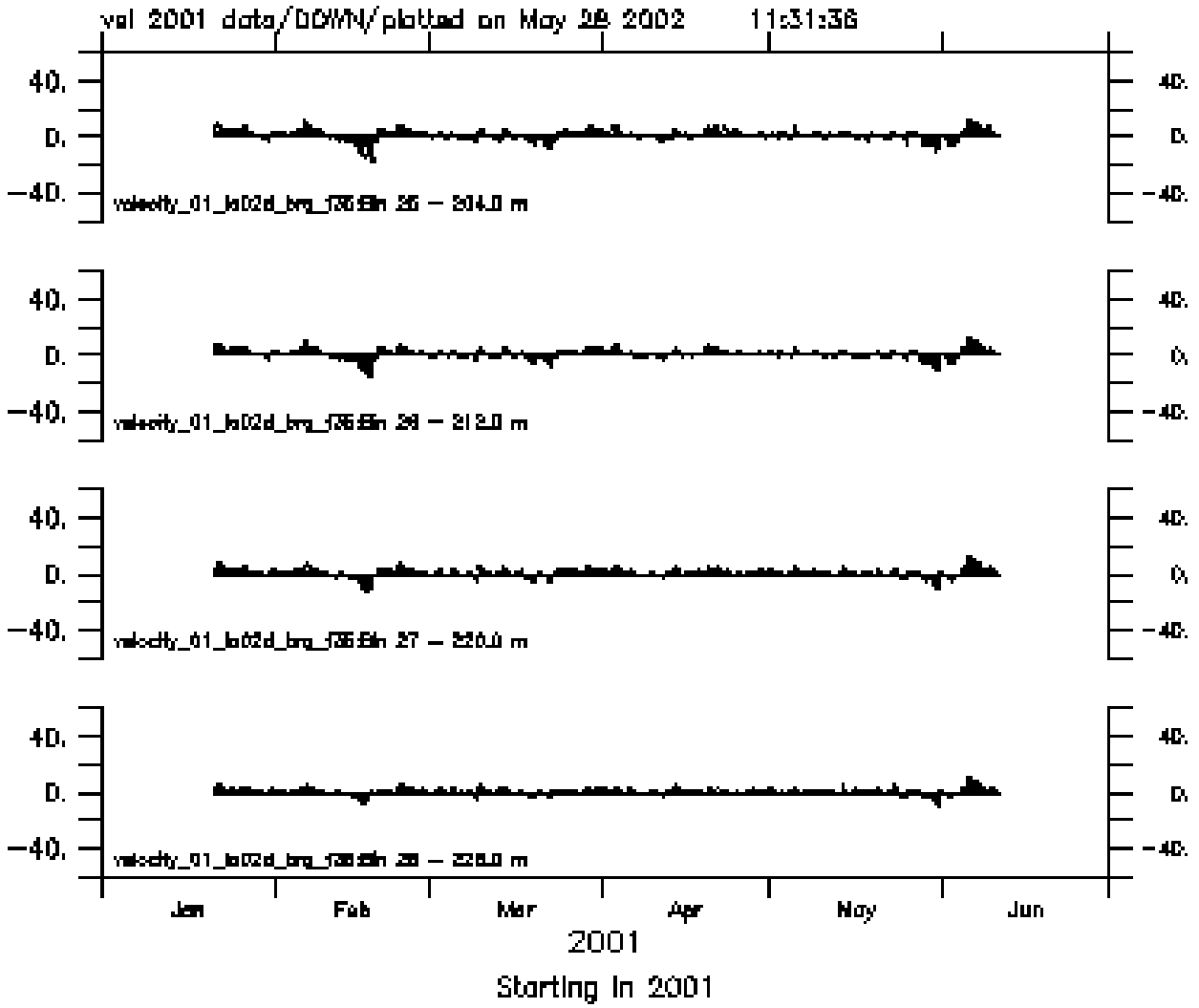

val_2000 data/UP/plotted on May 28 2002 11:30:02
40.
0.
-40.
velocity_00_ja02c_brg_1355in 8 – 173.0 m
velocity_00_ja02c_brg_1355in 7 – 181.0 m
velocity_00_ja02c_brg_1355in 6 – 189.0 m
velocity_00_ja02c_brg_1355in 5 – 197.0 m
velocity_00_ja02c_brg_1355in 4 – 205.0 m
velocity_00_ja02c_brg_1355in 3 – 213.0 m
velocity_00_ja02c_brg_1355in 2 – 221.0 m
velocity_00_ja02c_brg_1355in 1 – 229.0 m
20 25 30 5 10 15 20 25 30 5 10
Nov
Dec
Jan
Starting in 2000

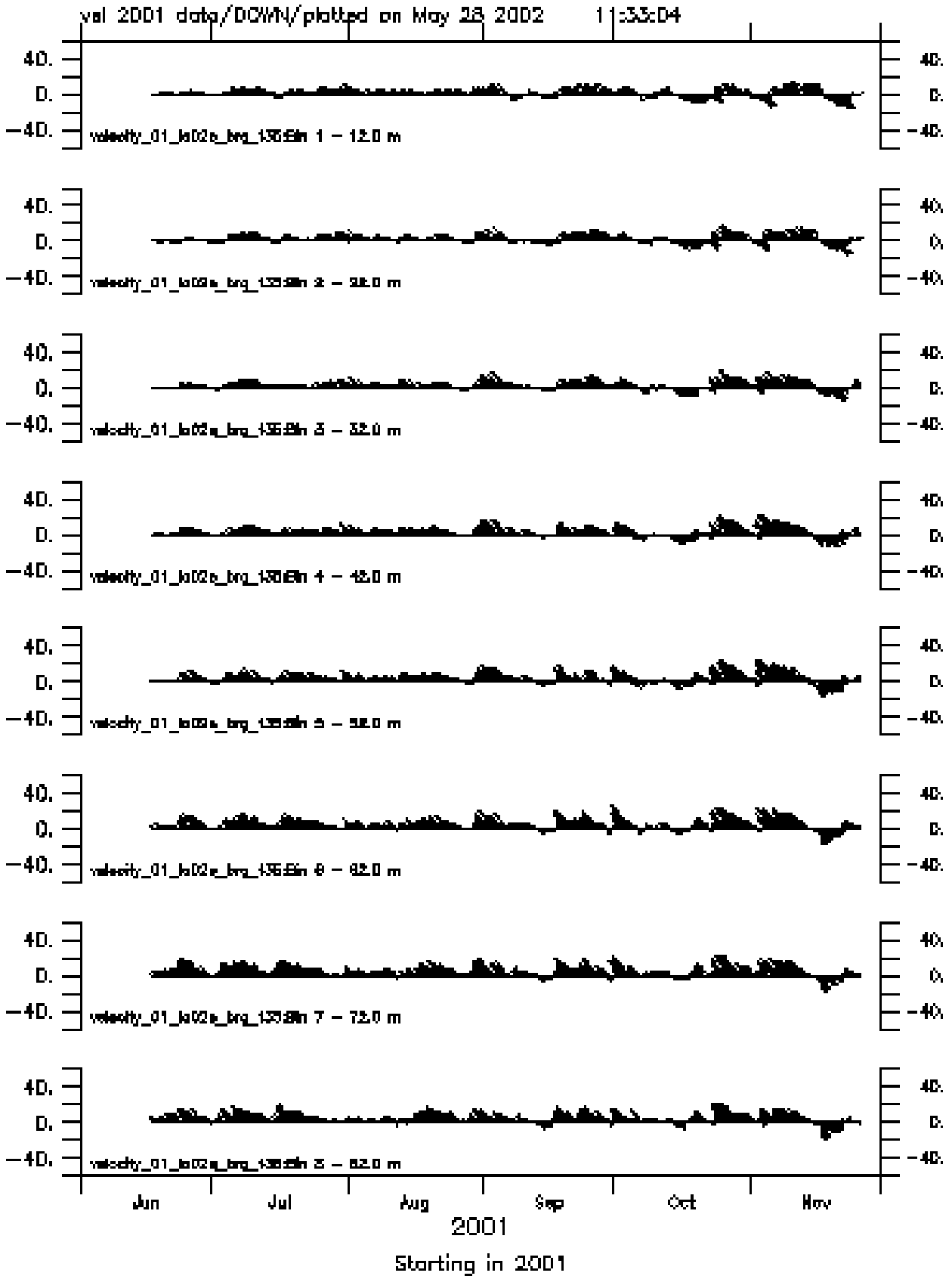


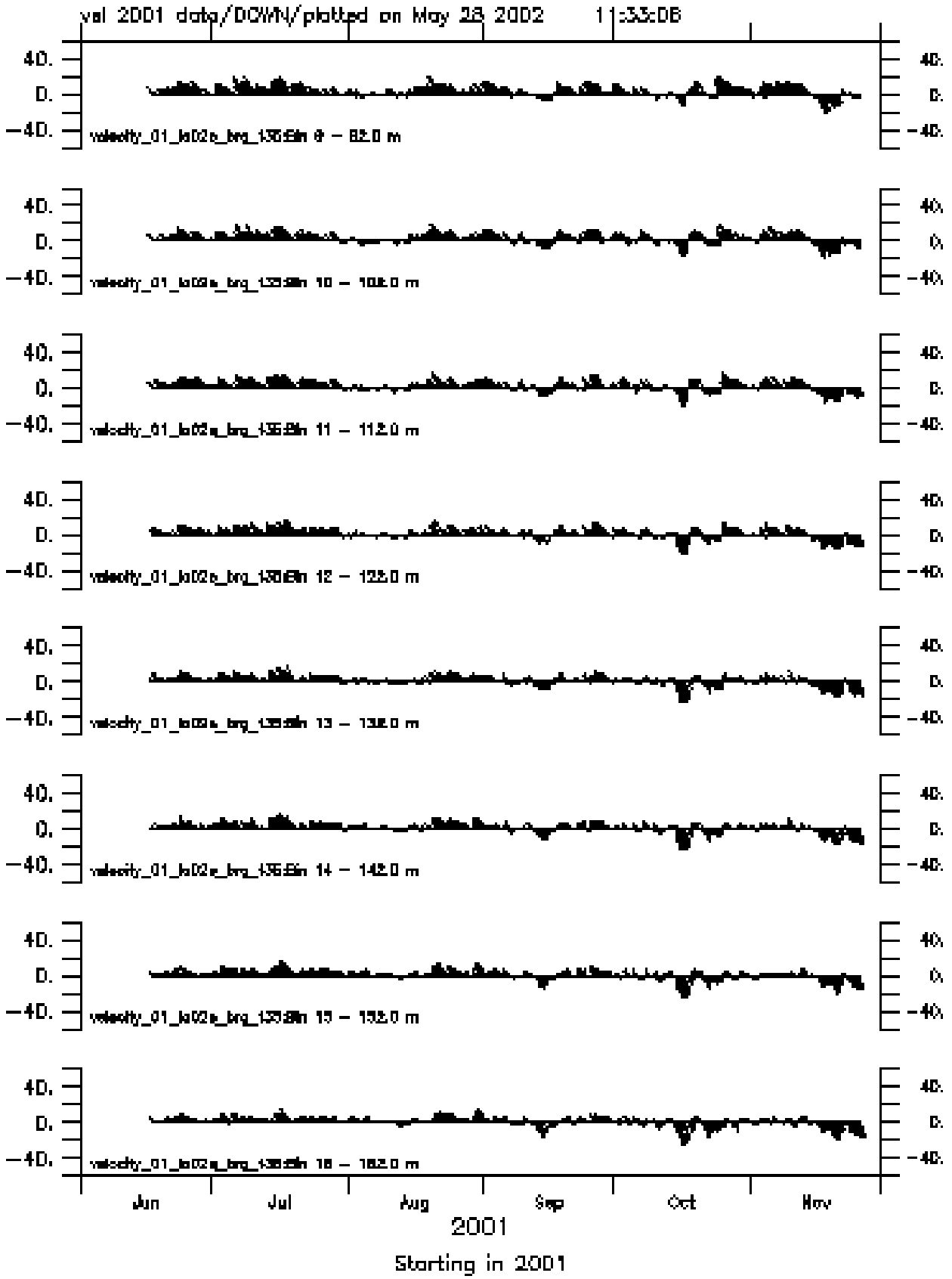
val 2001 data/DOWN/plotted on May 28 2002 11:31:30
40.
0.
-40.
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

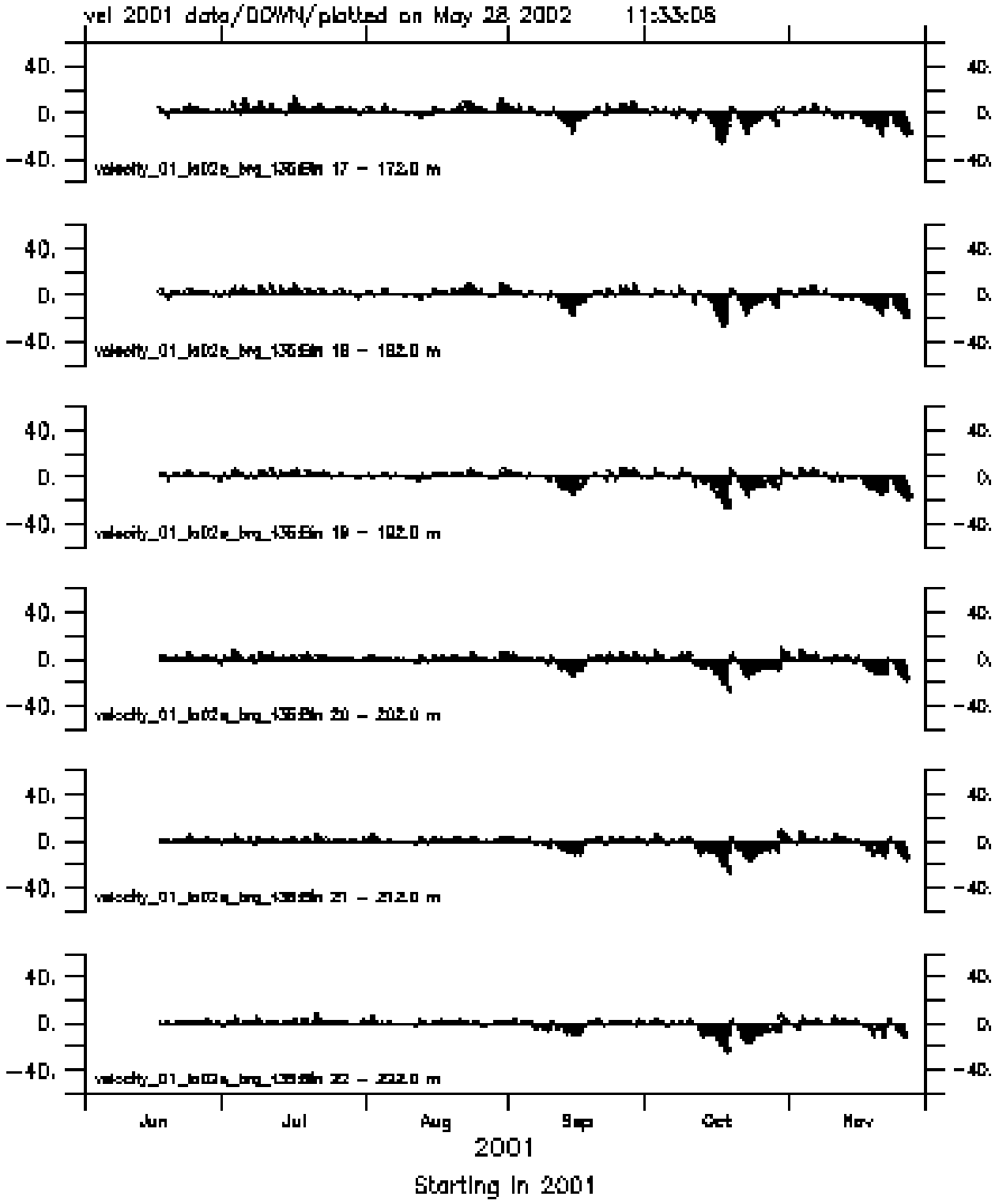

vel 2001 data/DOWN/plotted on May 28 2002 11:31:32
40.
0.
−40.
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

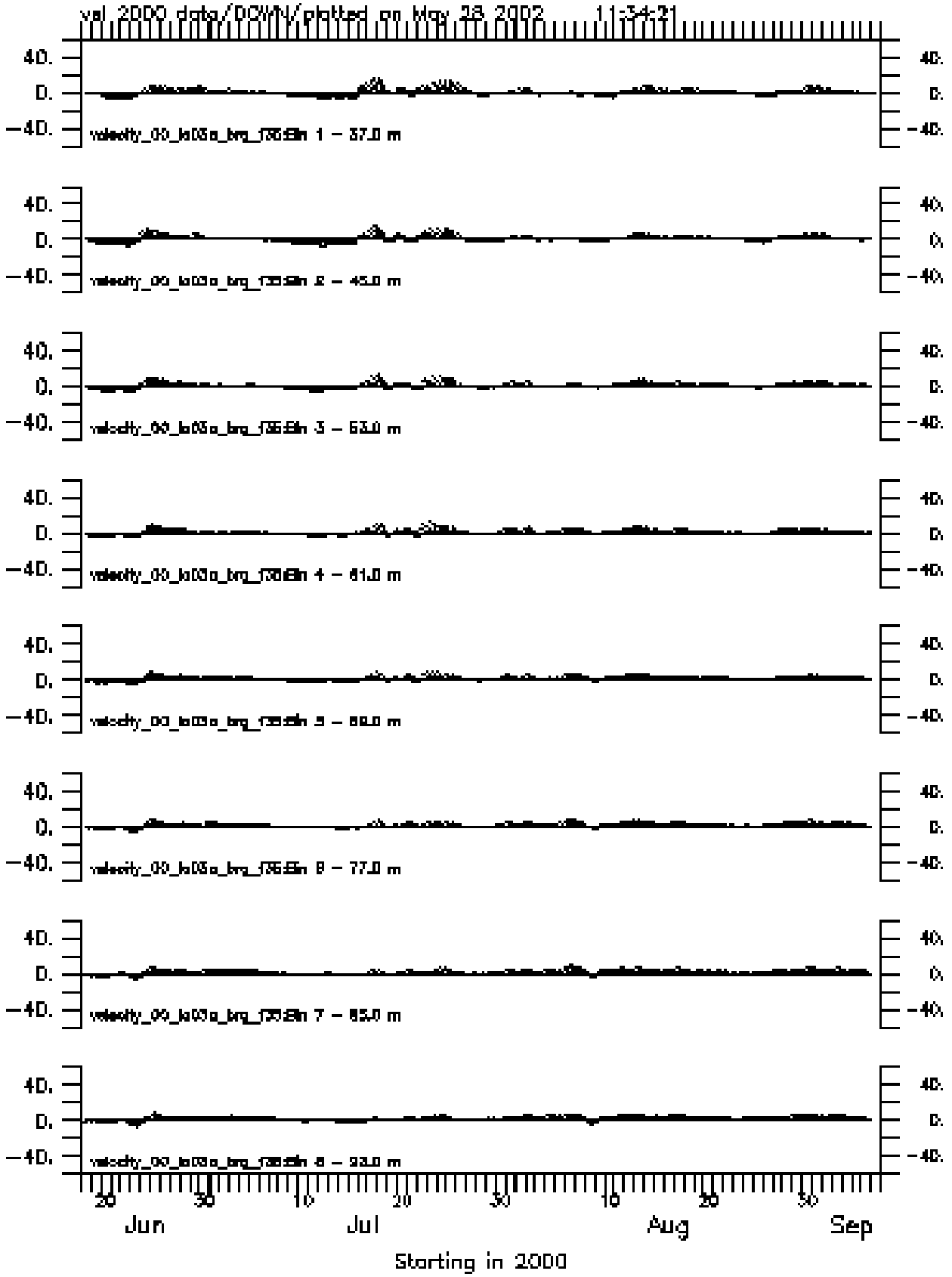

val 2001 data/DOWN/plotted on May 28 2002 11:31:34
40.
0.
-40.
velocity_01_jul02d_bnq_f35.85n 17 — 140.0 m
velocity_01_jul02d_bnq_f35.85n 18 — 148.0 m
velocity_01_jul02d_bnq_f35.85n 19 — 156.0 m
velocity_01_jul02d_bnq_f35.85n 20 — 164.0 m
velocity_01_jul02d_bnq_f35.85n 21 — 172.0 m
velocity_01_jul02d_bnq_f35.85n 22 — 180.0 m
velocity_01_jul02d_bnq_f35.85n 23 — 188.0 m
velocity_01_jul02d_bnq_f35.85n 24 — 196.0 m
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

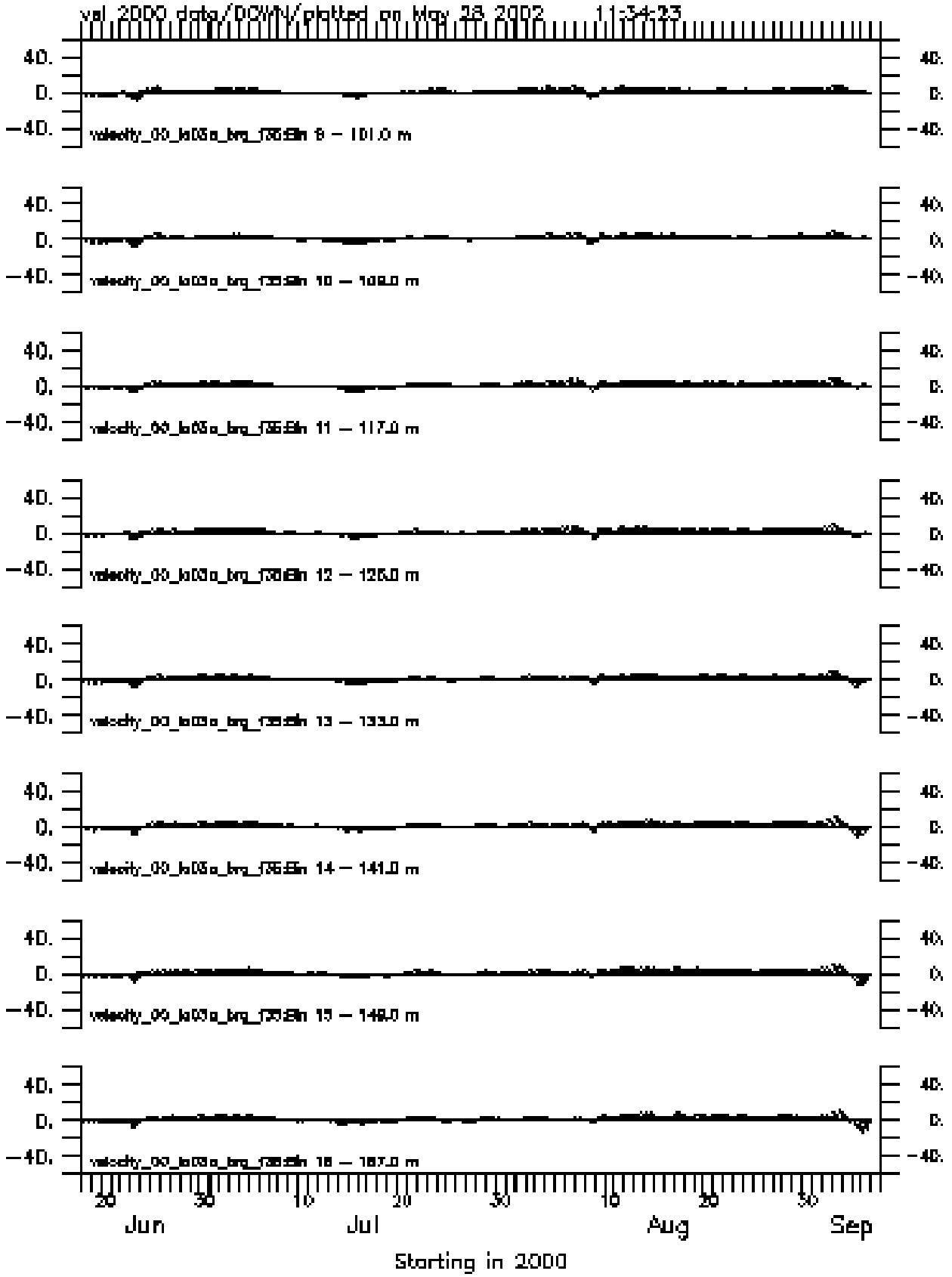

val 2001 data/DOWN/plotted on May 28 2002 11:31:36
40.
0.
-40.
velocity_01_ja02d_brg_f365in 26 – 204.0 m
velocity_01_ja02d_brg_f365in 28 – 212.0 m
velocity_01_ja02d_brg_f365in 27 – 220.0 m
velocity_01_ja02d_brg_f365in 28 – 228.0 m
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

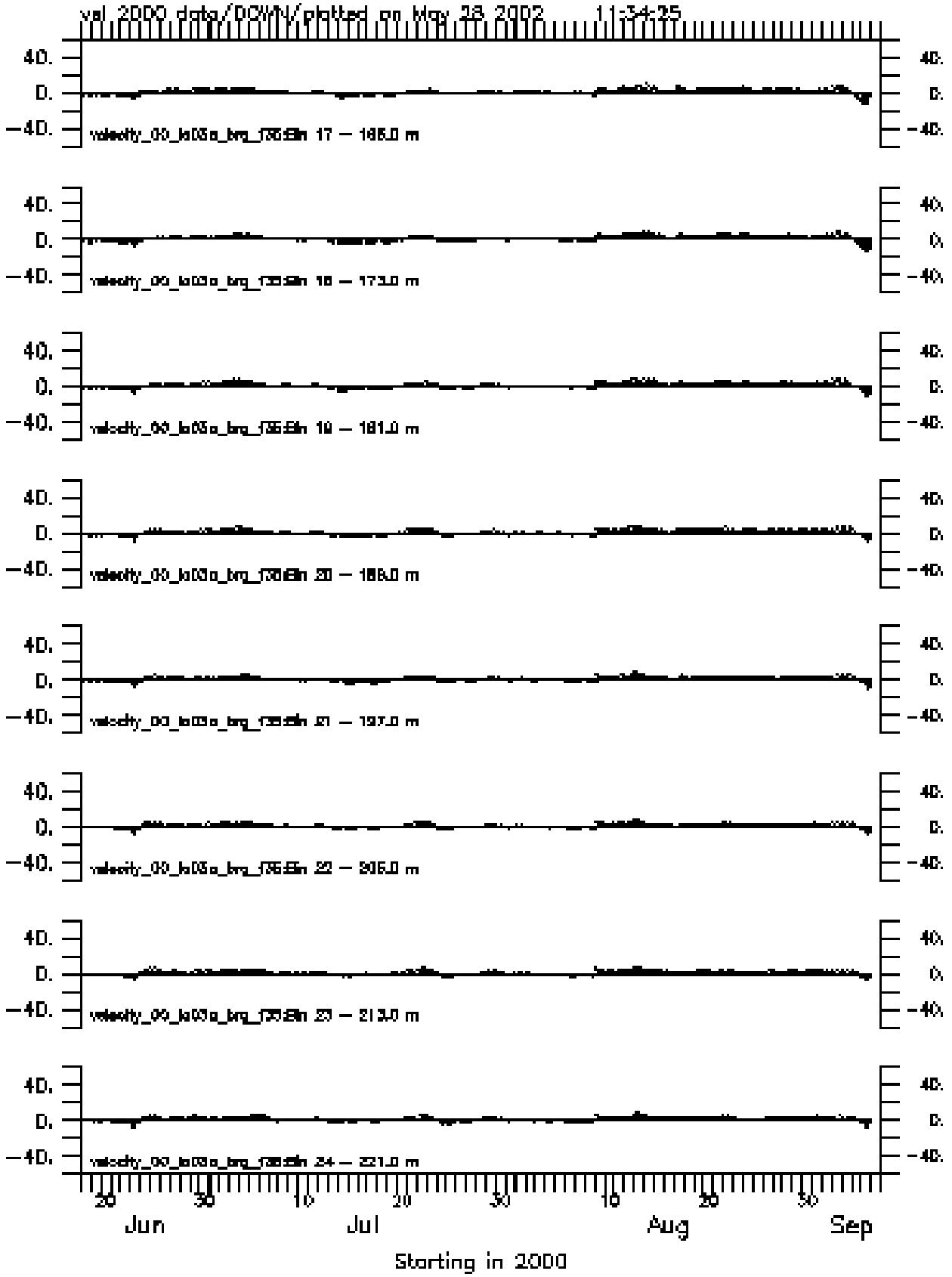

val 2001 data/DOWN/plotted on May 28 2002 11:33:04
40.
0.
-40.
Jun
Jul
Aug
Sep
Oct
Nov
2001
Starting in 2001

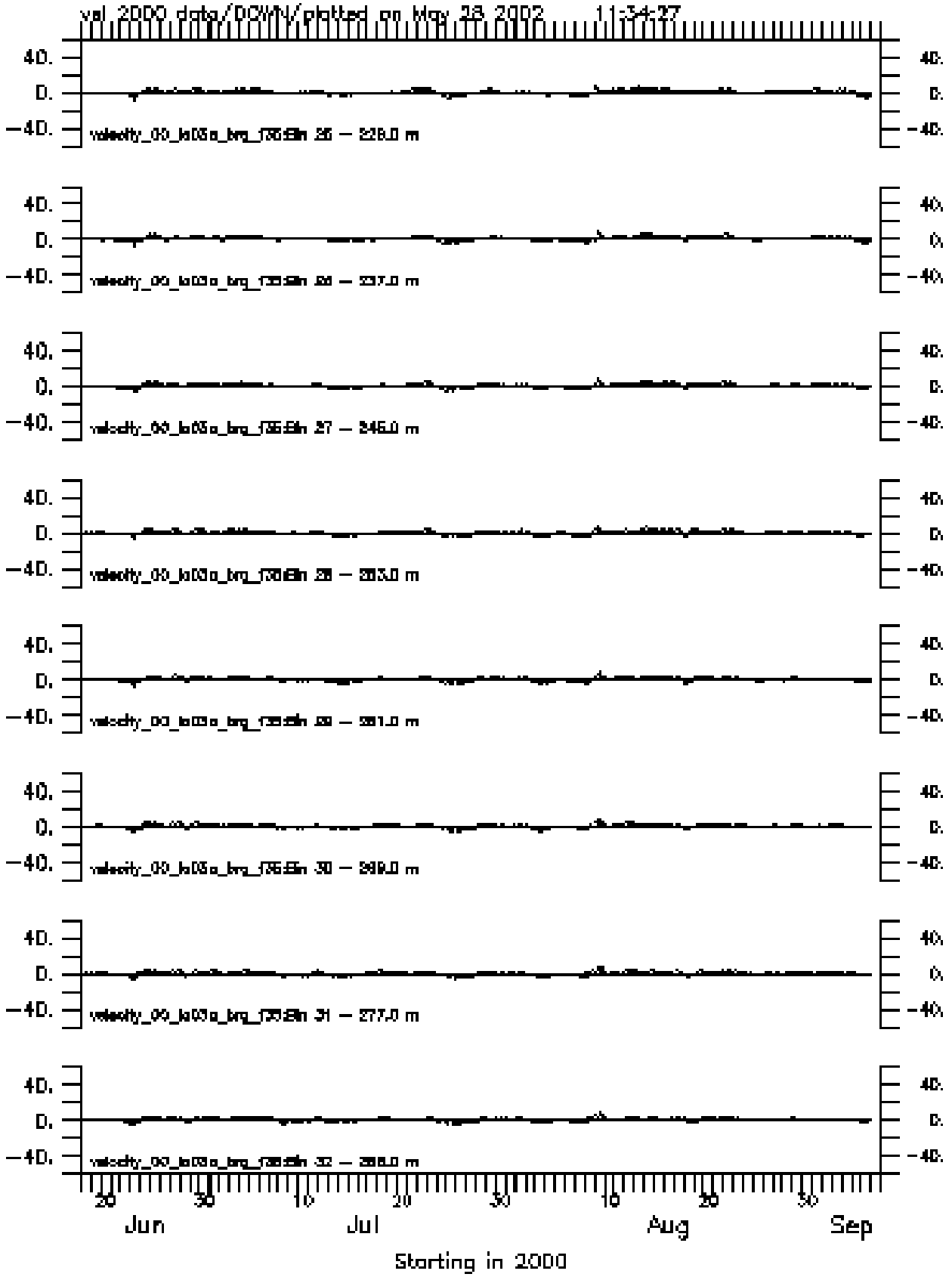

val 2001 data/DOWN/plotted on May 28 2002 11:33:08
40.
0.
-40.
velocity_01_ja02e_brg_1365in 9 – 82.0 m
velocity_01_ja02e_brg_1365in 10 – 102.0 m
velocity_01_ja02e_brg_1365in 11 – 112.0 m
velocity_01_ja02e_brg_1365in 12 – 122.0 m
velocity_01_ja02e_brg_1365in 13 – 132.0 m
velocity_01_ja02e_brg_1365in 14 – 142.0 m
velocity_01_ja02e_brg_1365in 15 – 152.0 m
velocity_01_ja02e_brg_1365in 16 – 162.0 m
Jun
Jul
Aug
Sep
Oct
Nov
2001
Starting in 2001

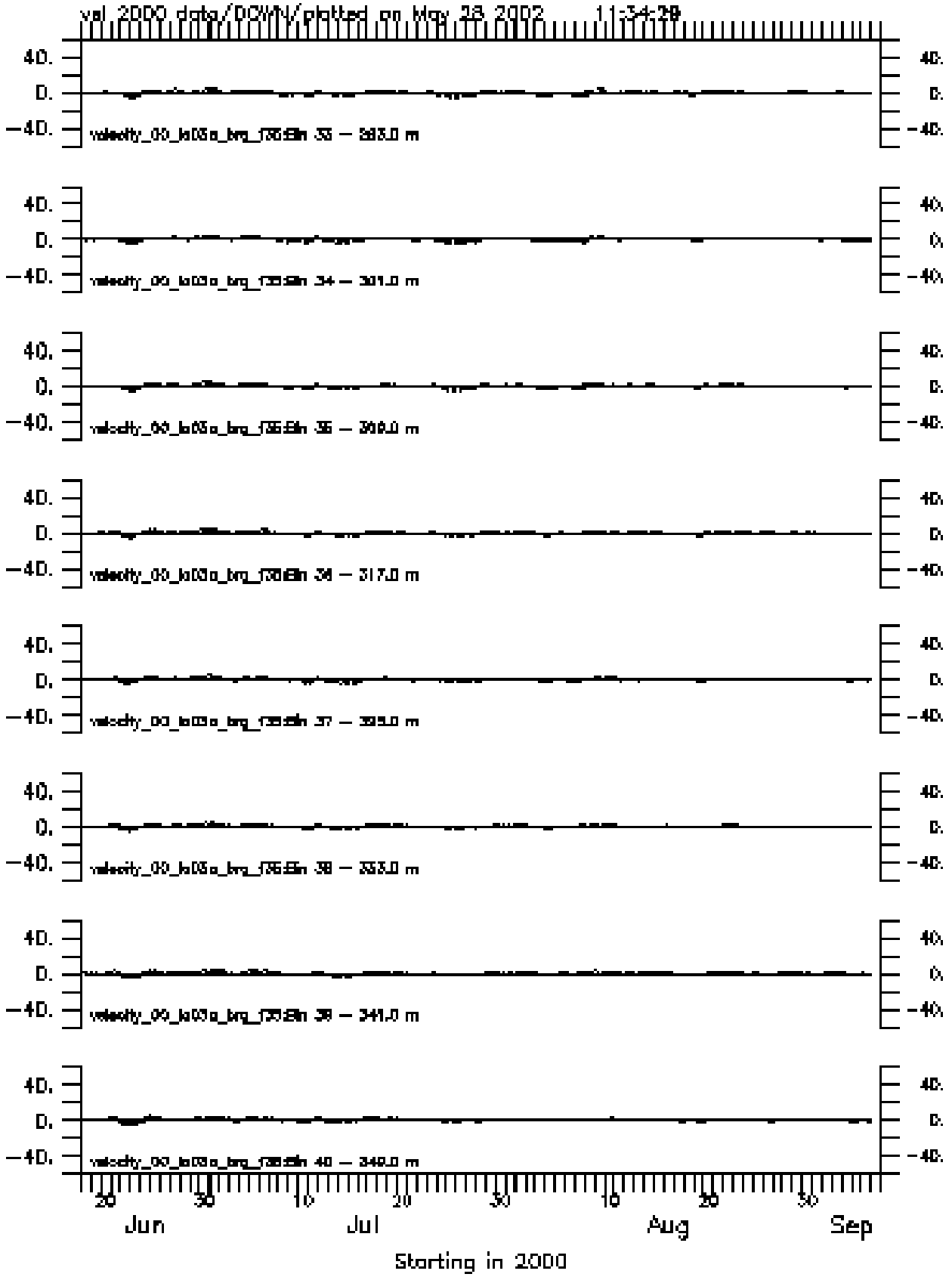

vel 2001 data/DOWN/plotted on May 28 2002 11:33:08
40.
0.
-40.
velocity_01_ja02a_brq_1365in 17 - 172.0 m
velocity_01_ja02a_brq_1365in 18 - 182.0 m
velocity_01_ja02a_brq_1365in 19 - 192.0 m
velocity_01_ja02a_brq_1365in 20 - 202.0 m
velocity_01_ja02a_brq_1365in 21 - 212.0 m
velocity_01_ja02a_brq_1365in 22 - 222.0 m
Jun
Jul
Aug
Sep
Oct
Nov
2001
Starting in 2001

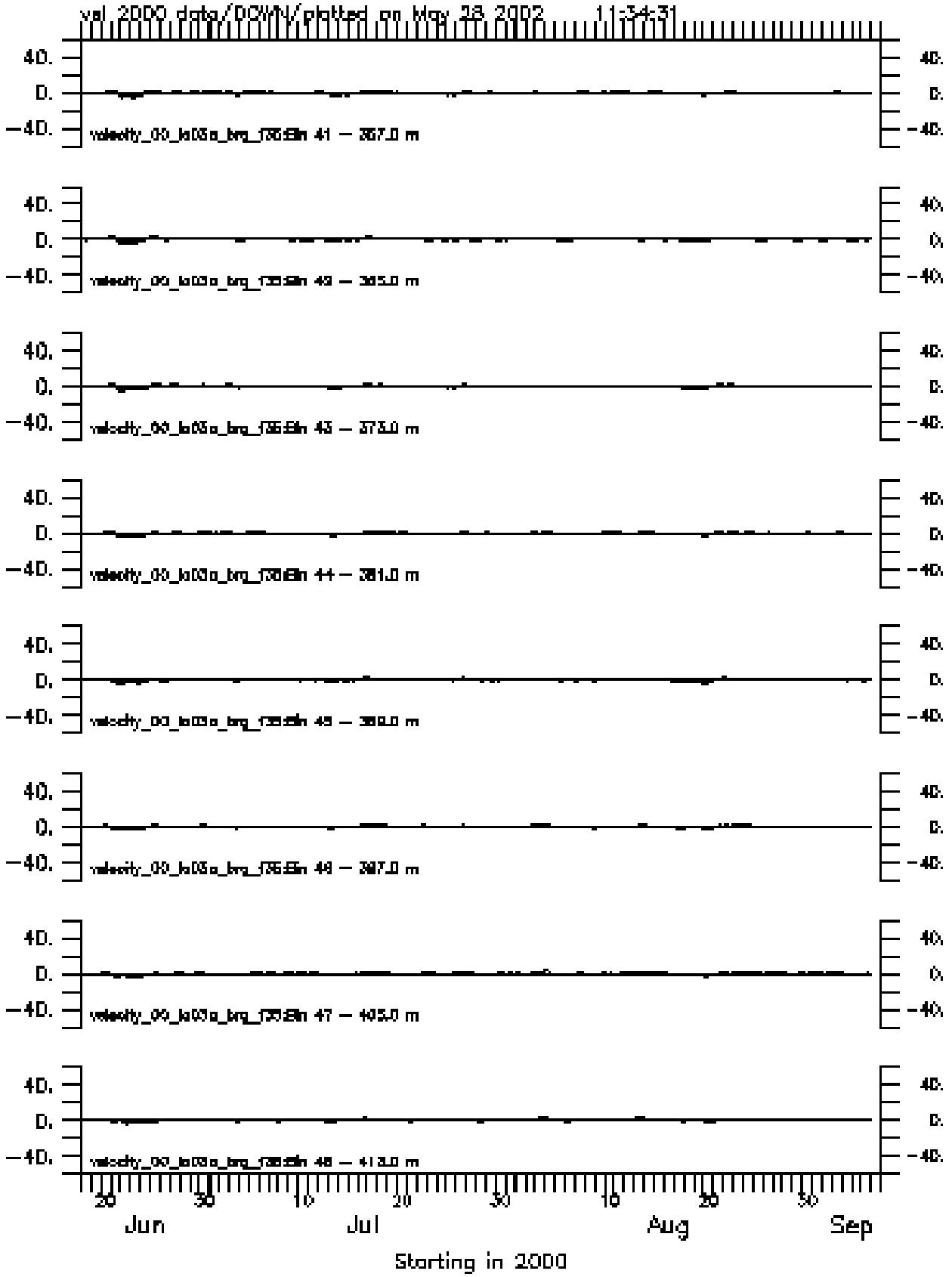

val_2000_data/DCWN/plotted on May 28 2002 11:34:21
40.
0.
-40.
velocity_00_ja03a_brg_f06.dln 1 – 37.0 m
velocity_00_ja03a_brg_f06.dln 2 – 45.0 m
velocity_00_ja03a_brg_f06.dln 3 – 53.0 m
velocity_00_ja03a_brg_f06.dln 4 – 61.0 m
velocity_00_ja03a_brg_f06.dln 5 – 69.0 m
velocity_00_ja03a_brg_f06.dln 6 – 77.0 m
velocity_00_ja03a_brg_f06.dln 7 – 85.0 m
velocity_00_ja03a_brg_f06.dln 8 – 93.0 m
20
30
10
20
30
10
20
30
Jun
Jul
Aug
Sep
Starting in 2000

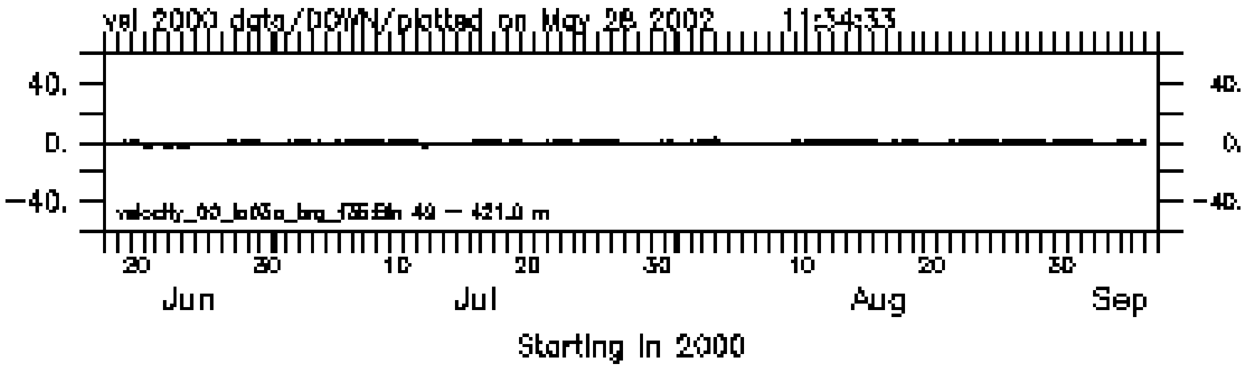

val 2000 data/DCWN/plotted on May 28 2002 11:34:23
40.
0.
-40.
velocity_00_ja03a_brg_f365lin 9 — 101.0 m
velocity_00_ja03a_brg_f365lin 10 — 109.0 m
velocity_00_ja03a_brg_f365lin 11 — 117.0 m
velocity_00_ja03a_brg_f365lin 12 — 125.0 m
velocity_00_ja03a_brg_f365lin 13 — 133.0 m
velocity_00_ja03a_brg_f365lin 14 — 141.0 m
velocity_00_ja03a_brg_f365lin 15 — 149.0 m
velocity_00_ja03a_brg_f365lin 16 — 157.0 m
20
30
10
20
30
10
20
30
Jun
Jul
Aug
Sep
Starting in 2000

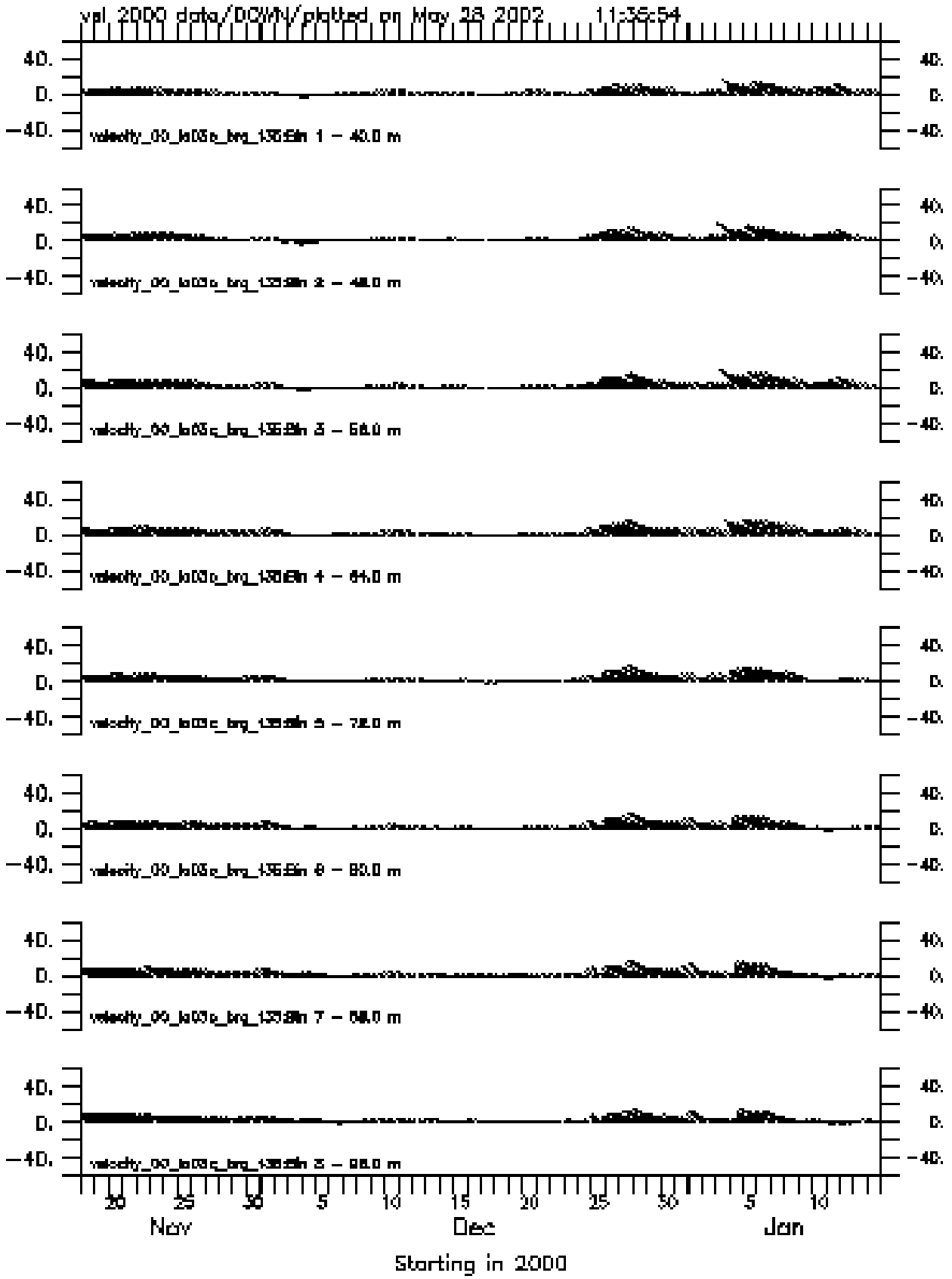

val 2000 data/DCWN/plotted on May 28 2002 11:34:25
40.
0.
-40.
velocity_00_ja03a_brg_f365flh 17 — 165.0 m
velocity_00_ja03a_brg_f365flh 18 — 173.0 m
velocity_00_ja03a_brg_f365flh 19 — 181.0 m
velocity_00_ja03a_brg_f365flh 20 — 189.0 m
velocity_00_ja03a_brg_f365flh 21 — 197.0 m
velocity_00_ja03a_brg_f365flh 22 — 205.0 m
velocity_00_ja03a_brg_f365flh 23 — 213.0 m
velocity_00_ja03a_brg_f365flh 24 — 221.0 m
20
30
10
20
30
10
20
30
Jun
Jul
Aug
Sep
Starting in 2000

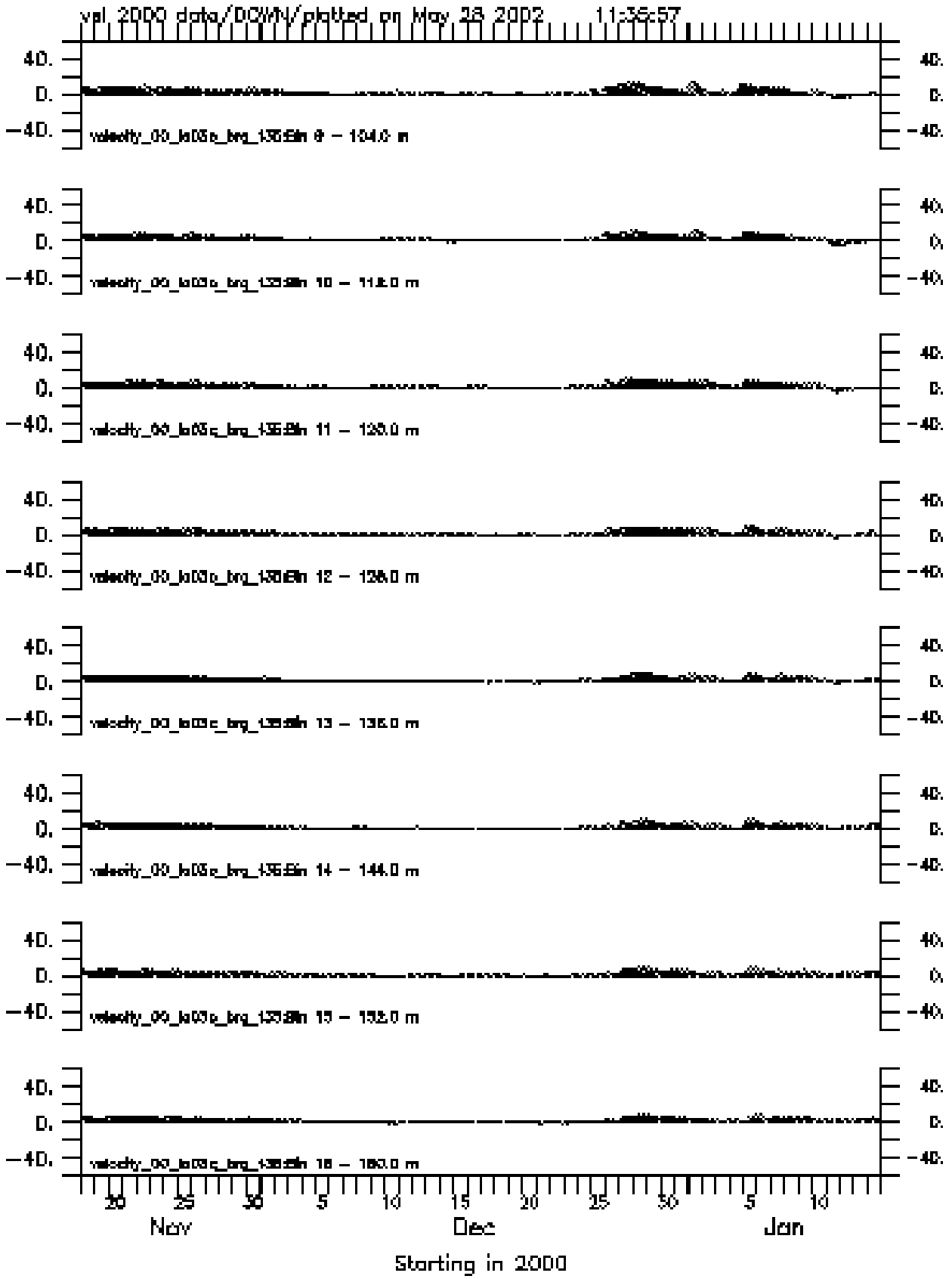

val 2000 data/DCWN/plotted on May 28 2002 11:34:27
40.
0.
-40.
velocity_00_ja03a_brg_f365flh 26 — 228.0 m
velocity_00_ja03a_brg_f365flh 27 — 245.0 m
velocity_00_ja03a_brg_f365flh 28 — 263.0 m
velocity_00_ja03a_brg_f365flh 29 — 281.0 m
velocity_00_ja03a_brg_f365flh 30 — 299.0 m
velocity_00_ja03a_brg_f365flh 31 — 317.0 m
velocity_00_ja03a_brg_f365flh 32 — 336.0 m
20
30
10
20
30
10
20
30
Jun
Jul
Aug
Sep
Starting in 2000

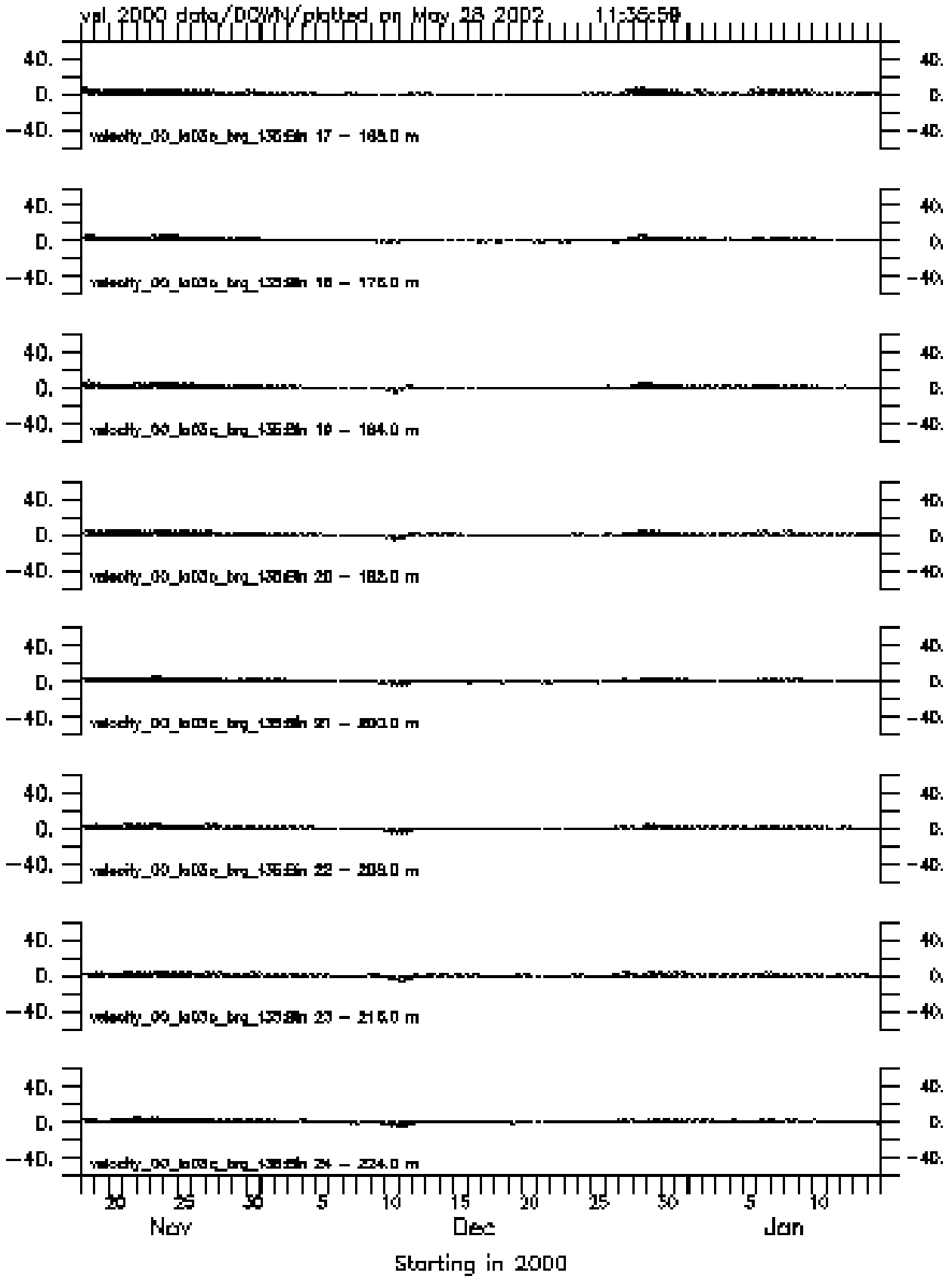

val_2000_data/DOWN/plotted on May 28 2002 11:34:28
40.
0.
-40.
Jun
Jul
Aug
Sep
Starting in 2000

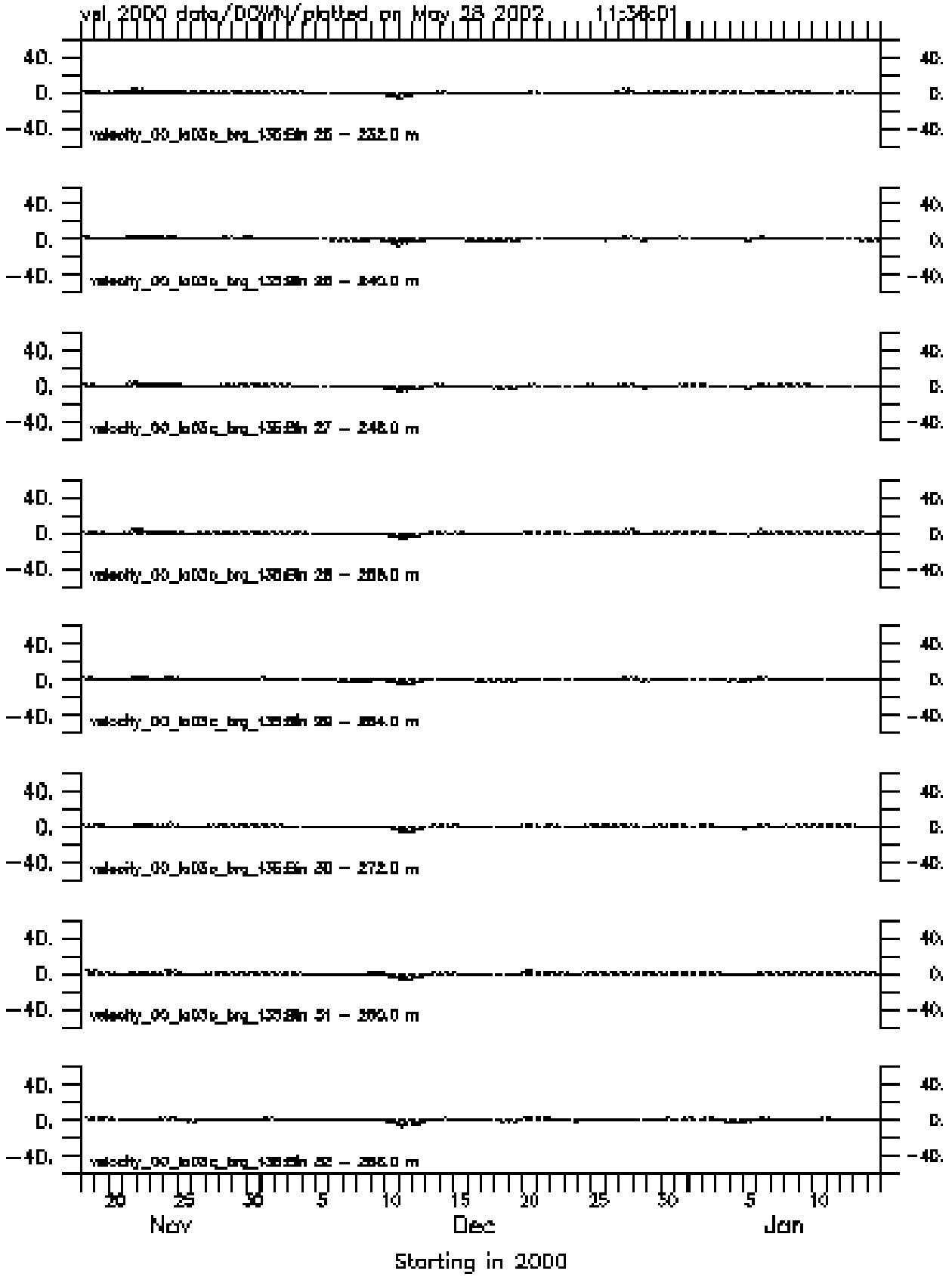

val_2000_data/DCWN/plotted on May 28 2002 11:34:31
40.
0.
-40.
Jun
Jul
Aug
Sep
Starting in 2000

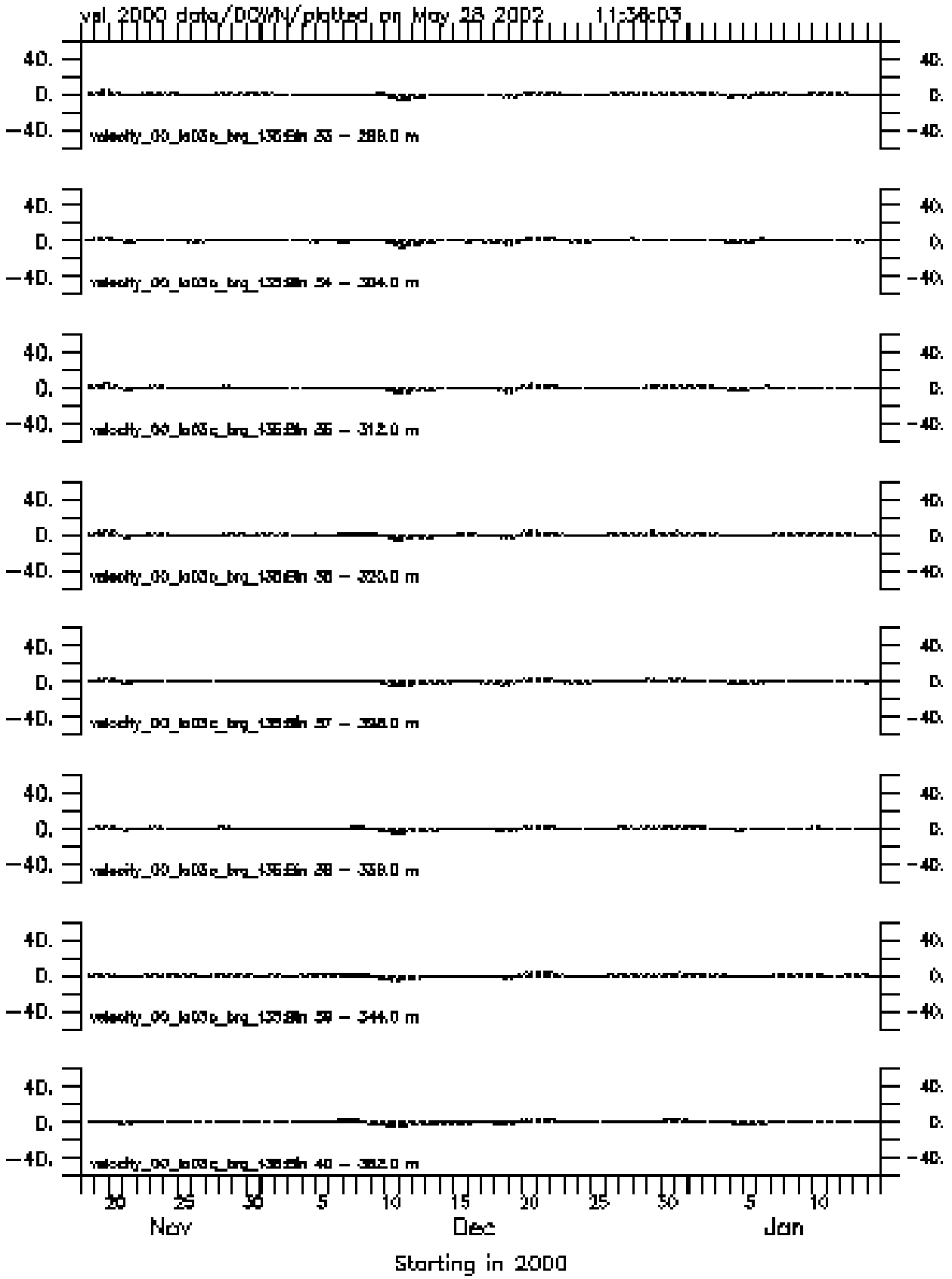

vel 2000 data/DOWN/plotted on May 29 2002 11:34:33
40.
0.
−40.
20
30
10
20
30
10
20
30
Jun
Jul
Aug
Sep
Starting in 2000

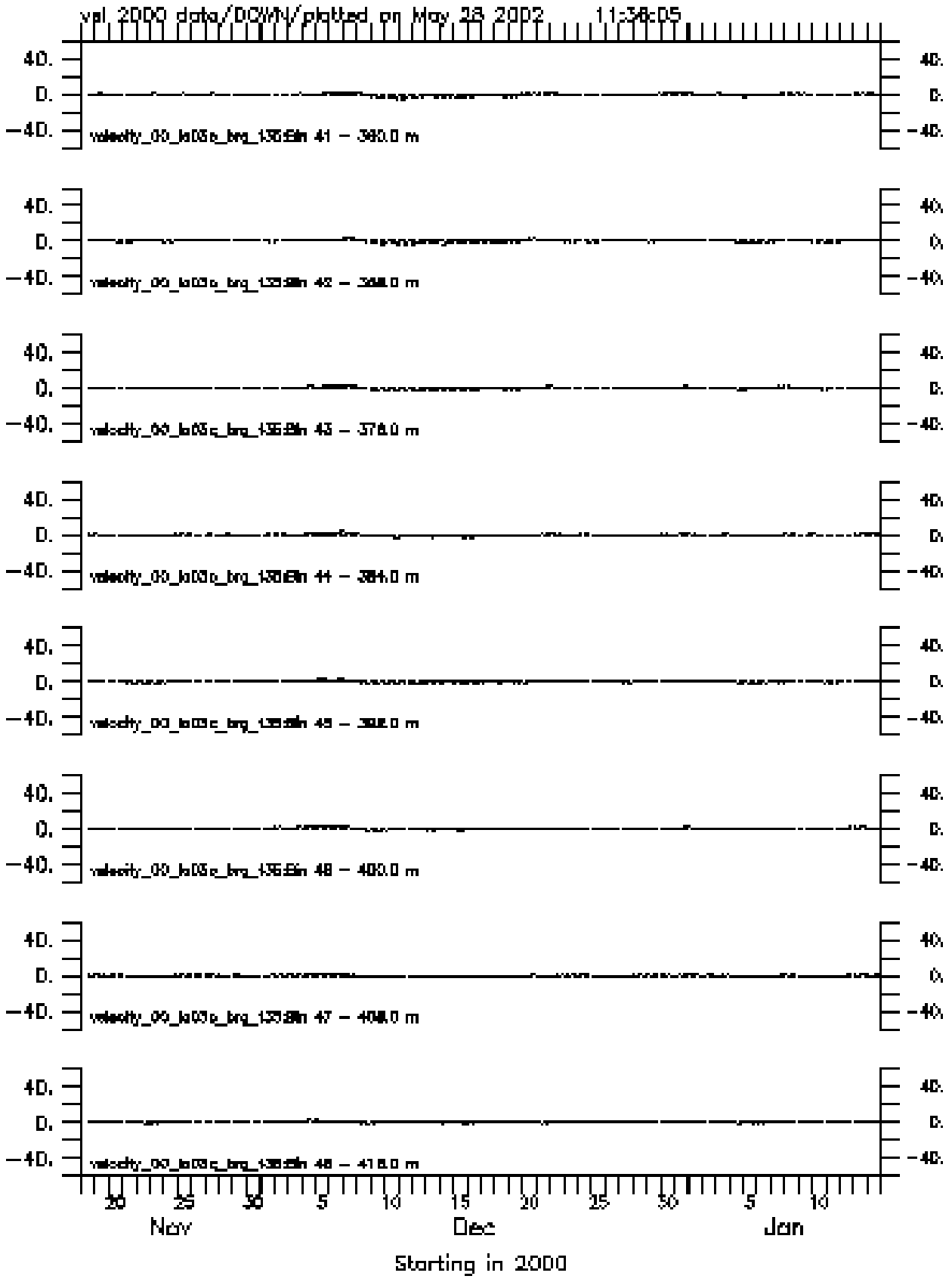

val 2000 data/DOWN/plotted on May 28 2002 11:36:54
40.
0.
-40.
Nov
Dec
Jan
Starting in 2000

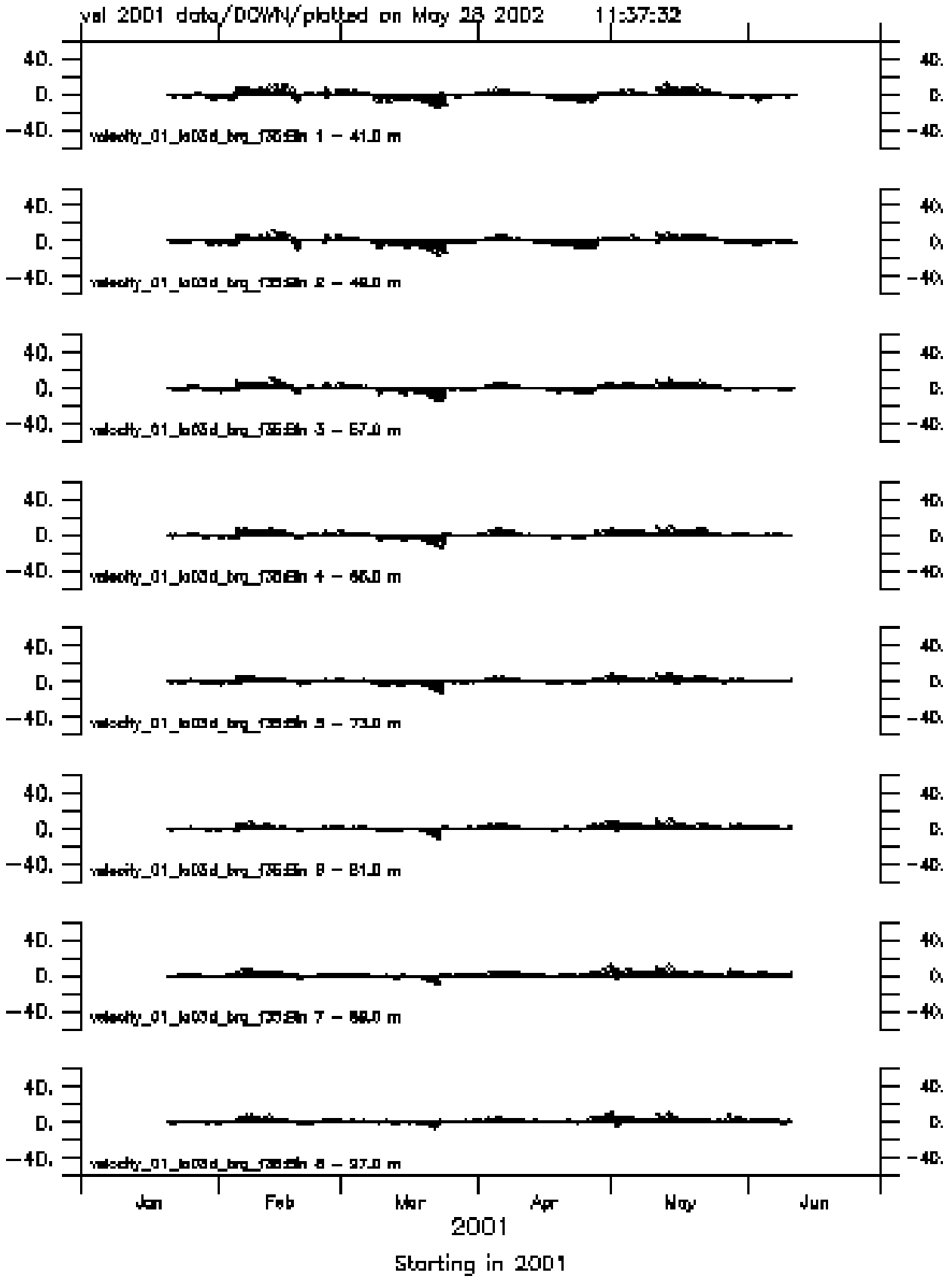

val_2000 data/DOWN/plotted on May 28 2002 11:36:57
40.
0.
-40.
velocity_00_ja03c_brg_t365bin 9 – 104.0 m
velocity_00_ja03c_brg_t365bin 10 – 114.0 m
velocity_00_ja03c_brg_t365bin 11 – 124.0 m
velocity_00_ja03c_brg_t365bin 12 – 134.0 m
velocity_00_ja03c_brg_t365bin 13 – 136.0 m
velocity_00_ja03c_brg_t365bin 14 – 144.0 m
velocity_00_ja03c_brg_t365bin 15 – 152.0 m
velocity_00_ja03c_brg_t365bin 16 – 160.0 m
20 25 30 5 10 15 20 25 30 5 10
Nov
Dec
Jan
Starting in 2000

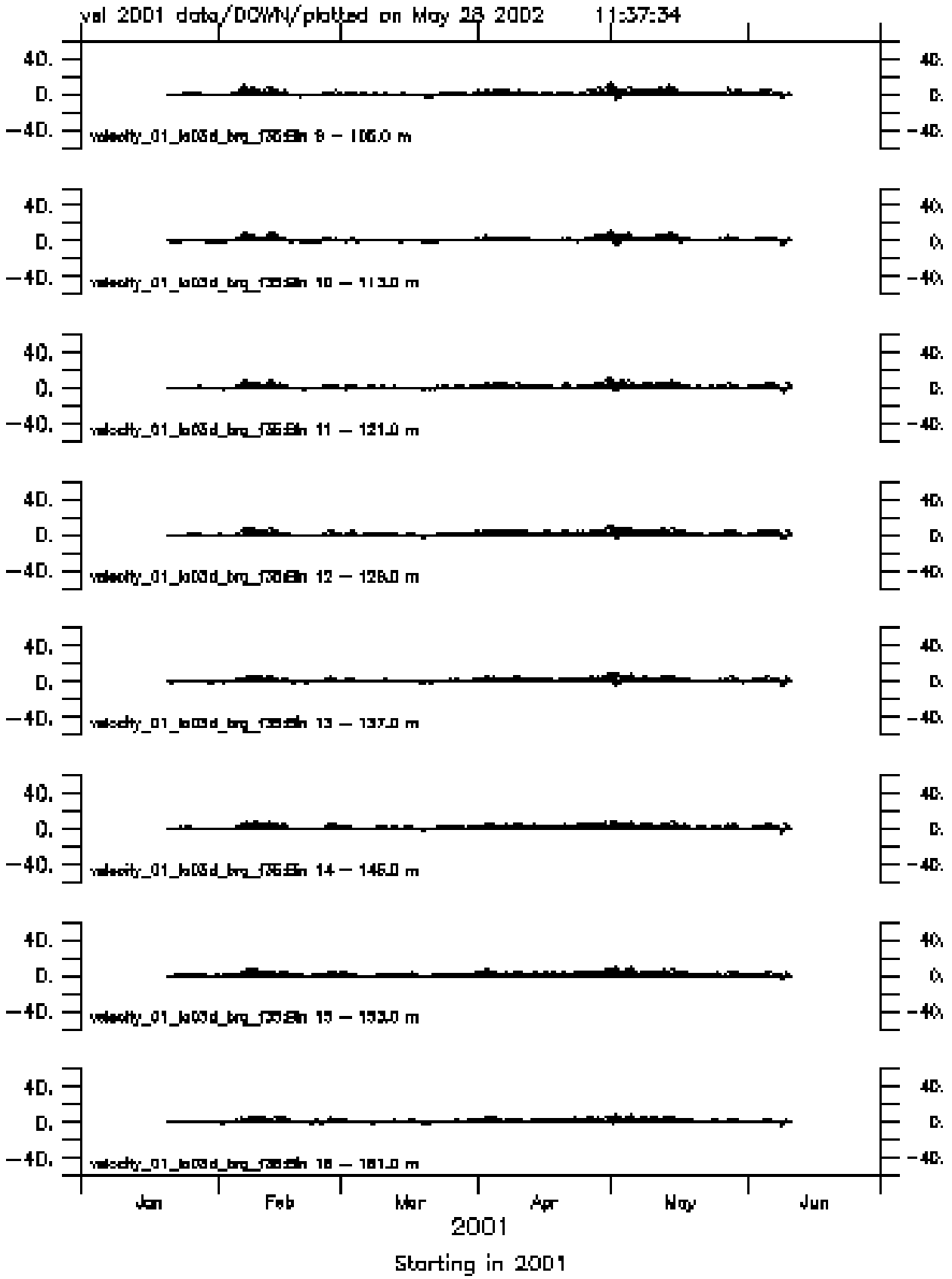

val 2000 data/DOWN/plotted on May 28 2002 11:36:58
40.
0.
-40.
velocity_00_ja03c_brg_t365in 17 – 165.0 m
velocity_00_ja03c_brg_t365in 18 – 174.0 m
velocity_00_ja03c_brg_t365in 19 – 184.0 m
velocity_00_ja03c_brg_t365in 20 – 193.0 m
velocity_00_ja03c_brg_t365in 21 – 203.0 m
velocity_00_ja03c_brg_t365in 22 – 209.0 m
velocity_00_ja03c_brg_t365in 23 – 215.0 m
velocity_00_ja03c_brg_t365in 24 – 224.0 m
20
25
30
5
10
15
20
25
30
5
10
Nov
Dec
Jan
Starting in 2000

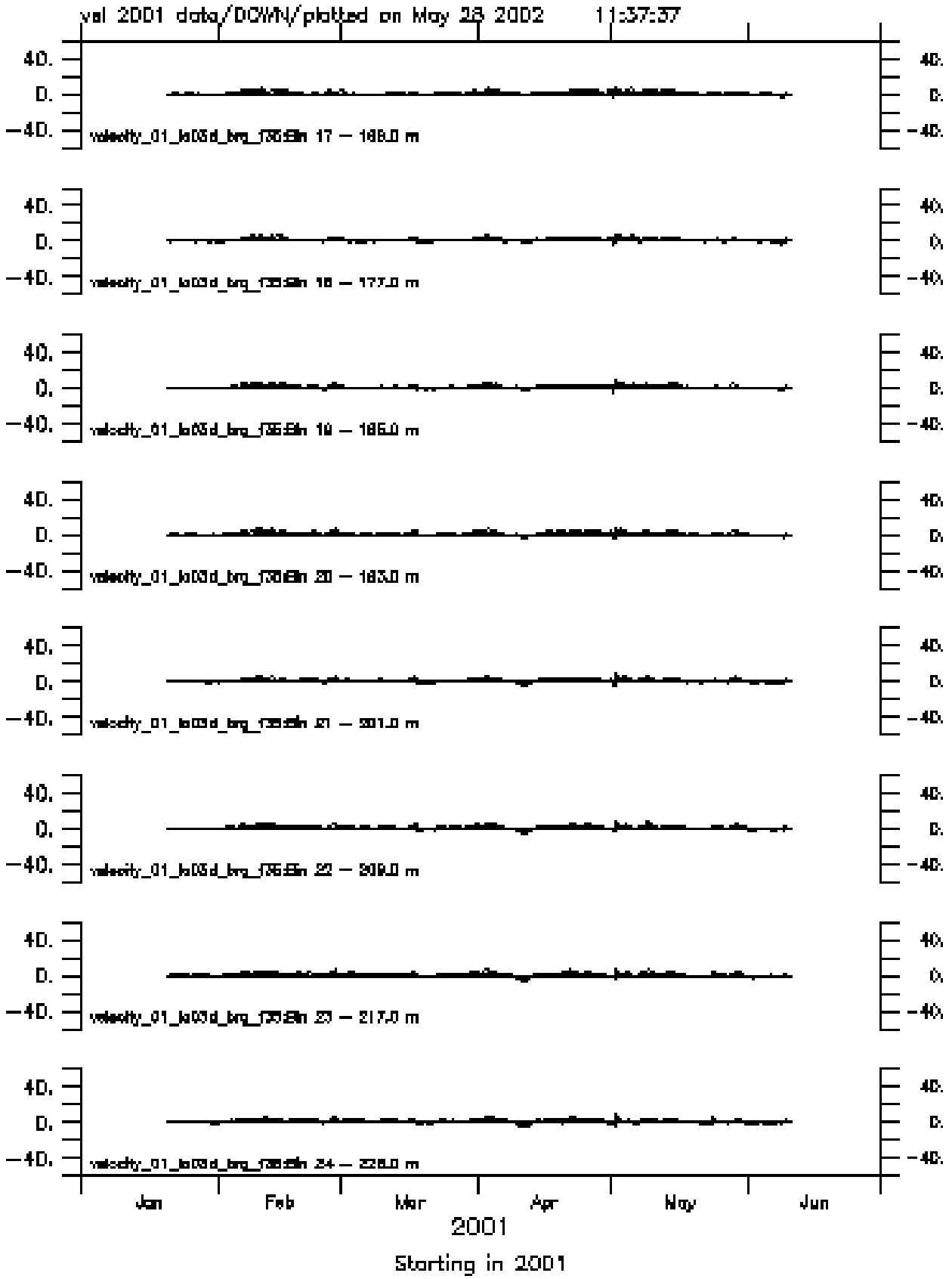

val 2000 data/DOWN/plotted on May 28 2002 11:36:01
40.
0.
-40.
velocity_00_ja03c_brg_t365lin 26 – 232.0 m
velocity_00_ja03c_brg_t365lin 27 – 248.0 m
velocity_00_ja03c_brg_t365lin 28 – 268.0 m
velocity_00_ja03c_brg_t365lin 29 – 284.0 m
velocity_00_ja03c_brg_t365lin 30 – 272.0 m
velocity_00_ja03c_brg_t365lin 31 – 260.0 m
velocity_00_ja03c_brg_t365lin 32 – 286.0 m
20
25
30
5
10
15
20
25
30
5
10
Nov
Dec
Jan
Starting in 2000

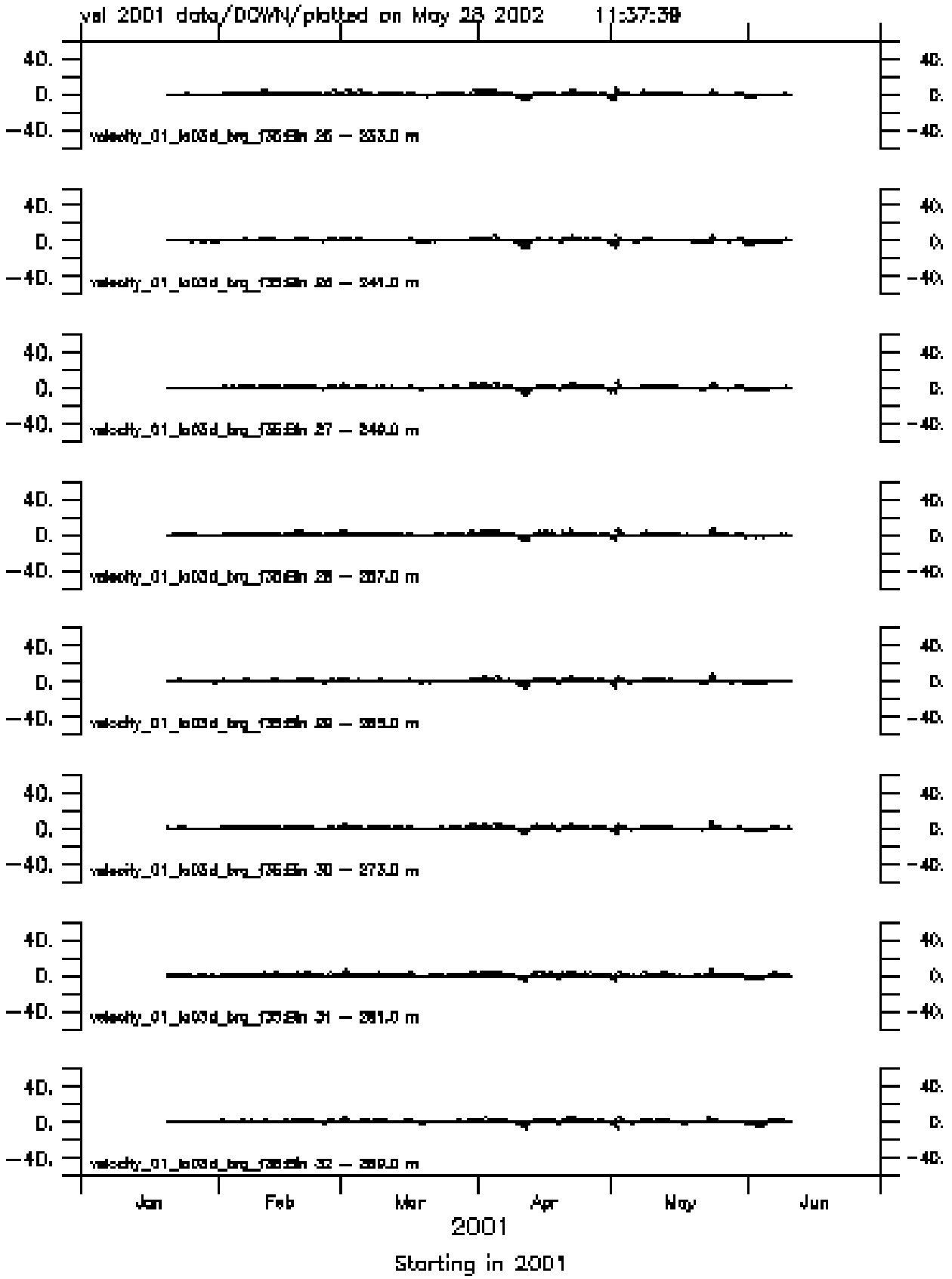

val 2000 data/DOWN/plotted on May 28 2002 11:36:03
40.
0.
-40.
Nov
Dec
Jan
Starting in 2000

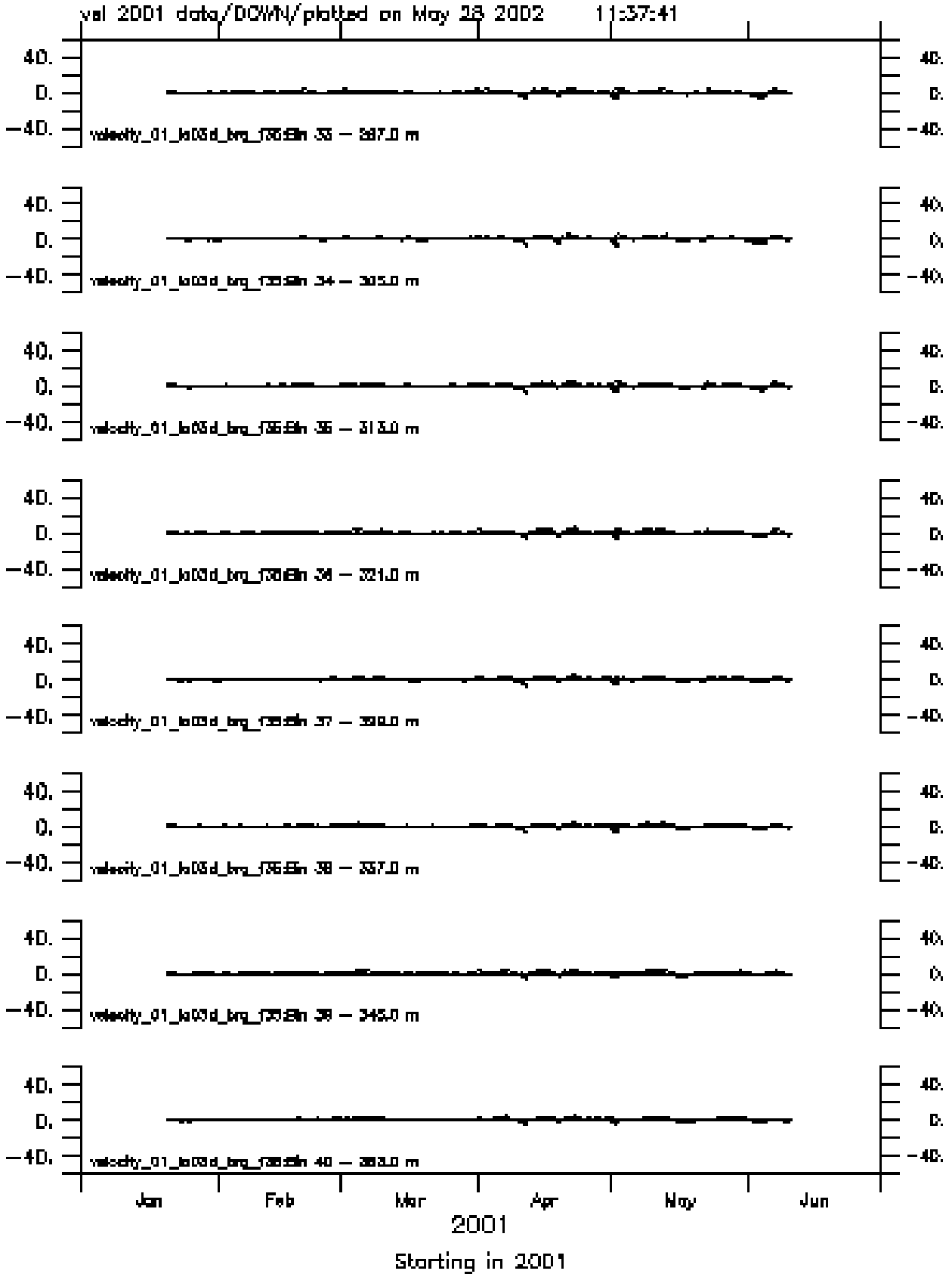

val 2000 data/DCWN/plotted on May 28 2002 11:36:05
40.
0.
-40.
velocity_00_la03c_brg_1355lin 41 – 360.0 m
velocity_00_la03c_brg_1355lin 42 – 368.0 m
velocity_00_la03c_brg_1355lin 43 – 376.0 m
velocity_00_la03c_brg_1355lin 44 – 384.0 m
velocity_00_la03c_brg_1355lin 45 – 392.0 m
velocity_00_la03c_brg_1355lin 46 – 400.0 m
velocity_00_la03c_brg_1355lin 47 – 408.0 m
velocity_00_la03c_brg_1355lin 48 – 416.0 m
20
25
30
5
10
15
20
25
30
5
10
Nov
Dec
Jan
Starting in 2000

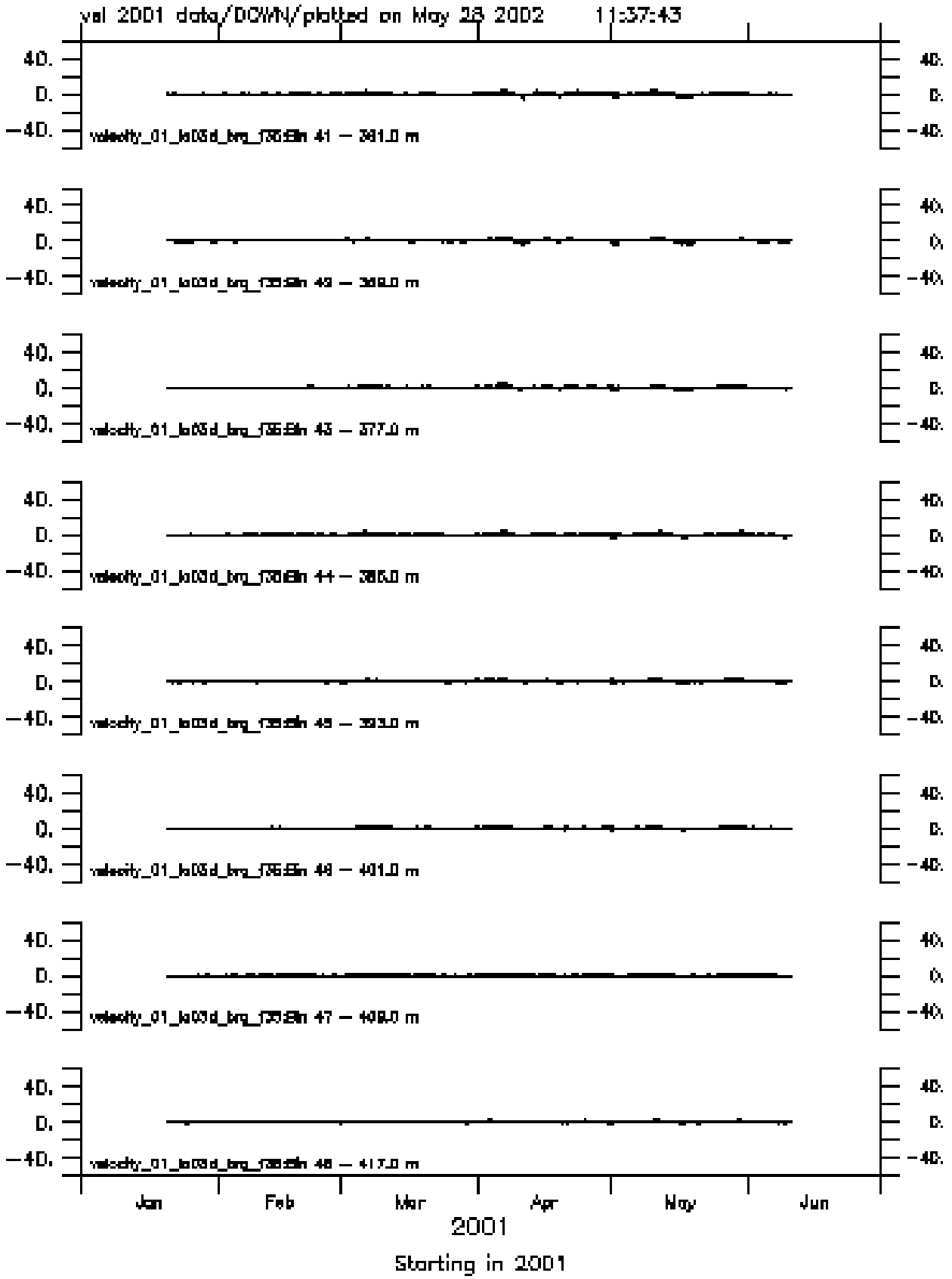

val 2001 data/DOWN/plotted on May 28 2002 11:37:32
40.
0.
-40.
velocity_01_ja03d_brg_f365flh 1 – 41.0 m
velocity_01_ja03d_brg_f365flh 2 – 49.0 m
velocity_01_ja03d_brg_f365flh 3 – 57.0 m
velocity_01_ja03d_brg_f365flh 4 – 65.0 m
velocity_01_ja03d_brg_f365flh 5 – 73.0 m
velocity_01_ja03d_brg_f365flh 6 – 81.0 m
velocity_01_ja03d_brg_f365flh 7 – 89.0 m
velocity_01_ja03d_brg_f365flh 8 – 97.0 m
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

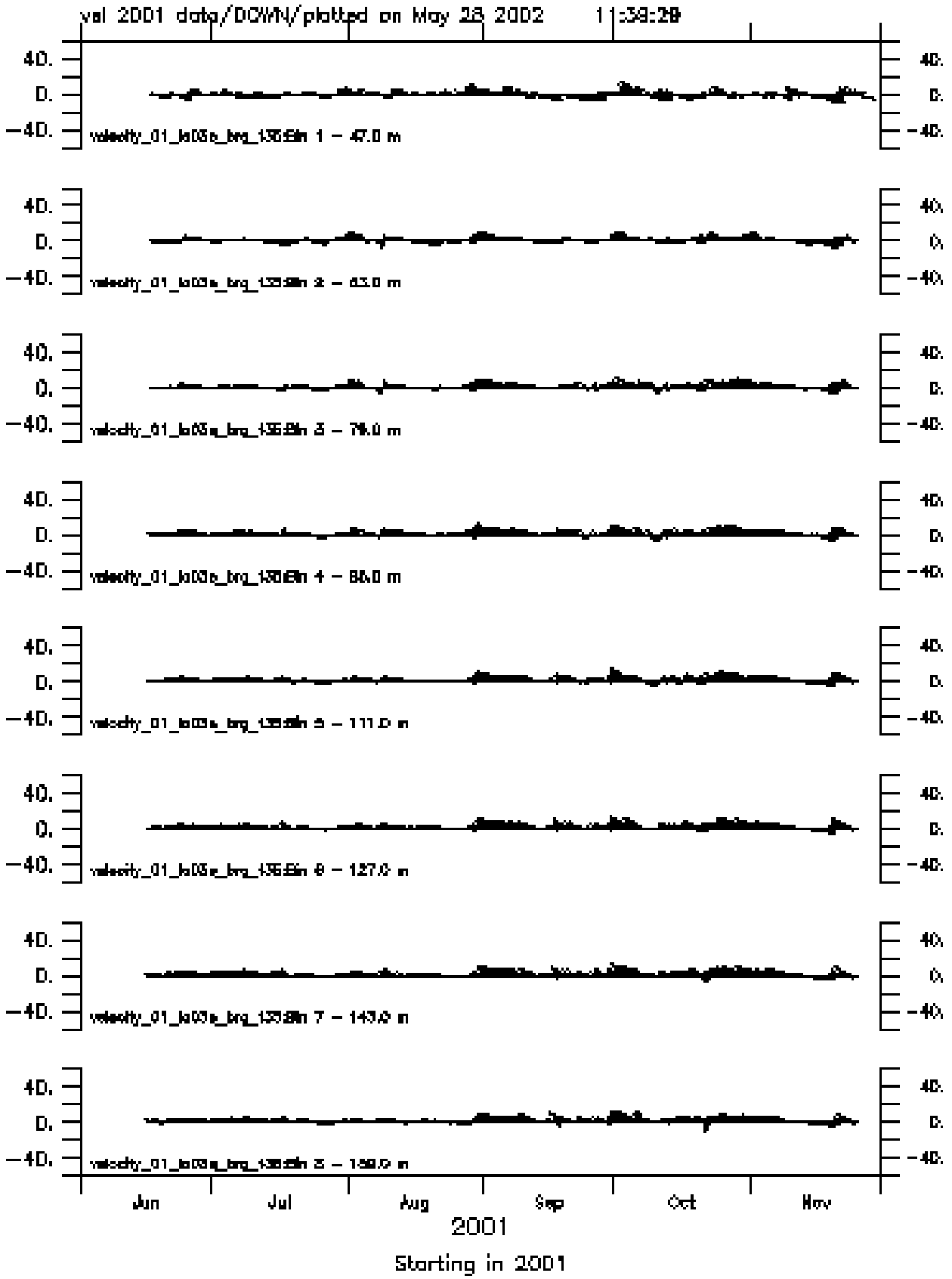

val 2001 data/DOWN/plotted on May 28 2002 11:37:34
40.
0.
-40.
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

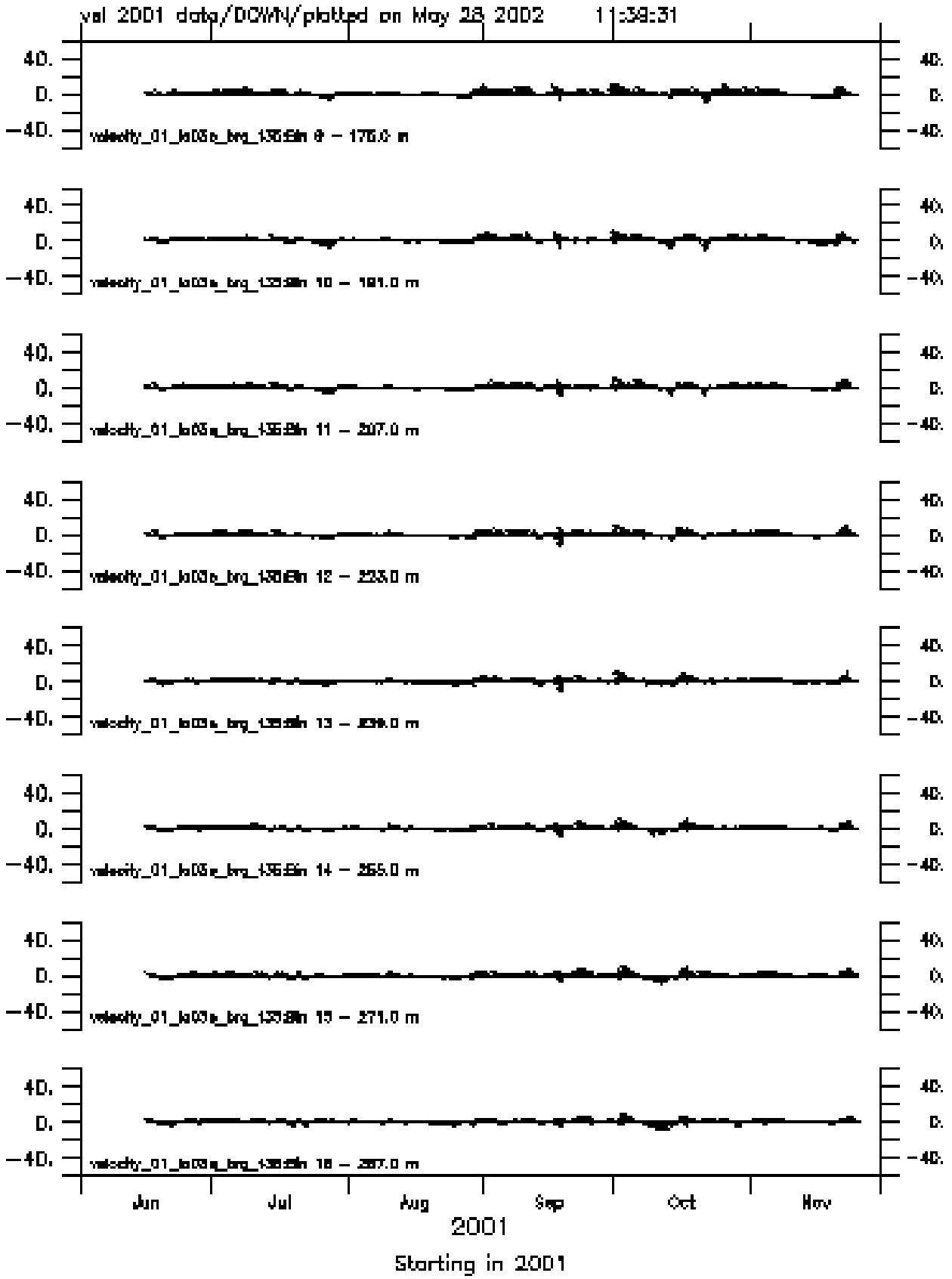

val 2001 data/DOWN/plotted on May 28 2002 11:37:37
40.
0.
-40.
velocity_01_ks03d_brg_f365flh 17 — 168.0 m
velocity_01_ks03d_brg_f365flh 18 — 177.0 m
velocity_01_ks03d_brg_f365flh 19 — 185.0 m
velocity_01_ks03d_brg_f365flh 20 — 193.0 m
velocity_01_ks03d_brg_f365flh 21 — 201.0 m
velocity_01_ks03d_brg_f365flh 22 — 209.0 m
velocity_01_ks03d_brg_f365flh 23 — 217.0 m
velocity_01_ks03d_brg_f365flh 24 — 225.0 m
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001

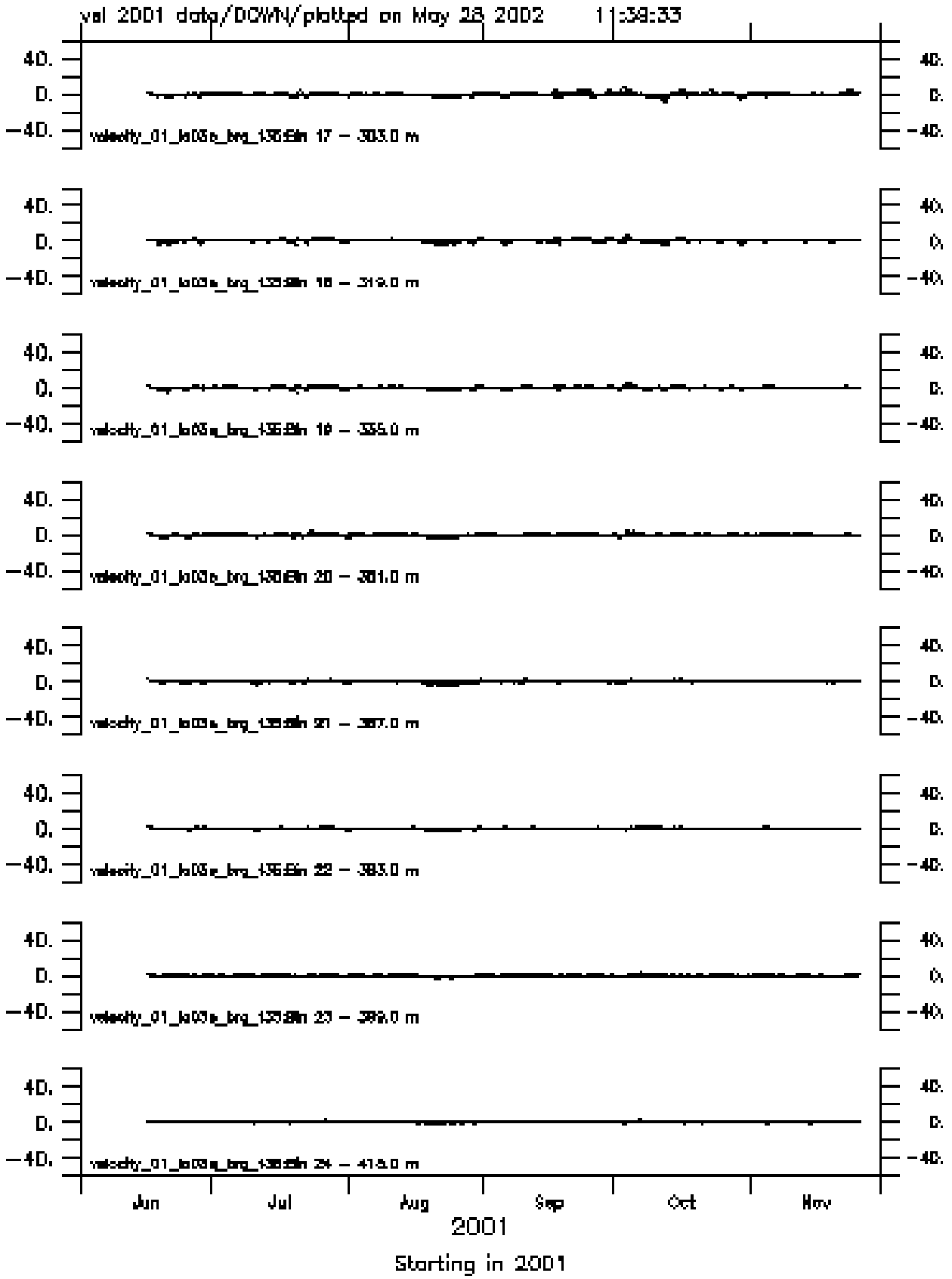

val 2001 data/DOWN/plotted on May 28 2002 11:37:38
40.
0.
-40.
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001


val 2001 data/DOWN/plotted on May 28 2002 11:37:41
40.
0.
-40.
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001


val 2001 data/DOWN/plotted on May 28 2002 11:37:43
40.
0.
-40.
velocity_01_ja03d_brg_f365flh 41 — 361.0 m
velocity_01_ja03d_brg_f365flh 43 — 377.0 m
velocity_01_ja03d_brg_f365flh 44 — 385.0 m
velocity_01_ja03d_brg_f365flh 46 — 401.0 m
velocity_01_ja03d_brg_f365flh 47 — 409.0 m
velocity_01_ja03d_brg_f365flh 48 — 417.0 m
Jan
Feb
Mar
Apr
May
Jun
2001
Starting in 2001


val 2001 data/DOWN/plotted on May 28 2002 11:38:28
40.
0.
-40.
Jun
Jul
Aug
Sep
Oct
Nov
2001
Starting in 2001


val 2001 data/DOWN/plotted on May 28 2002 11:38:31
40.
0.
-40.
Jun
Jul
Aug
Sep
Oct
Nov
2001
Starting in 2001


val 2001 data/DOWN/plotted on May 28 2002 11:38:33
40.
0.
-40.
Jun
Jul
Aug
Sep
Oct
Nov
2001
Starting in 2001

Appendix 3. RCM Data Plots

Time series of low-pass filtered (35-hr Lanczos) and hourly time series of unrotated (up-pointing vector is northward flow) current velocity (cm s^{-1}) from moored Recording Current Meter (RCM); no data for Site 3 from Jun 2000-Nov 2000.

A3-2 through A3-3: Site 2, deployment 1 (245 m, Jun 2000-Aug 2000)

A3-4 through A3-5: Site 2, deployment 2 (245 m, Aug 2000-Nov 2000)

A3-6 through A3-7: Site 2, deployment 3 (249 m, Nov 2000-Jan 2001)

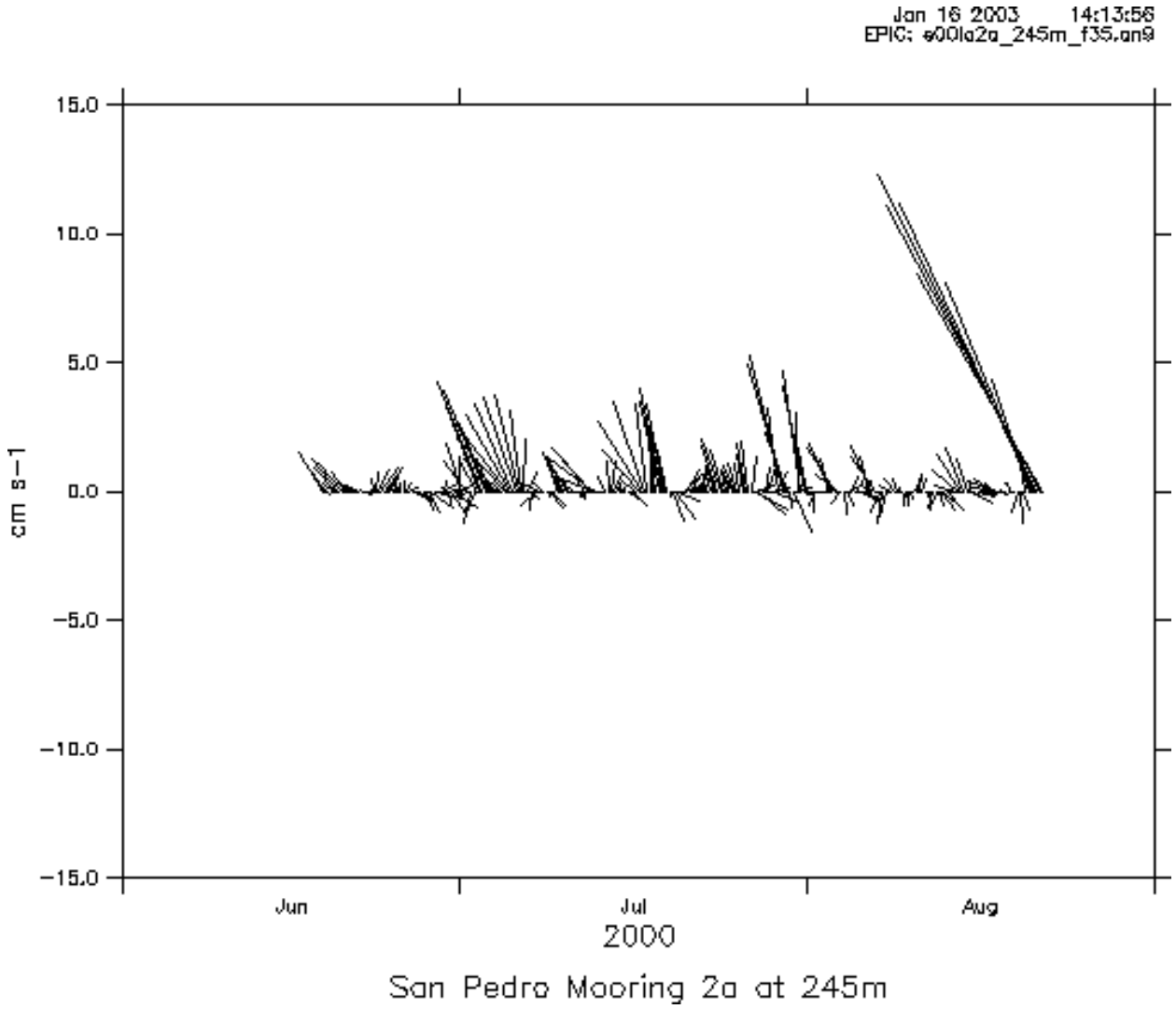
A3-8 through A3-9: Site 2, deployment 4 (248 m, Jan 2001-Jun 2001)

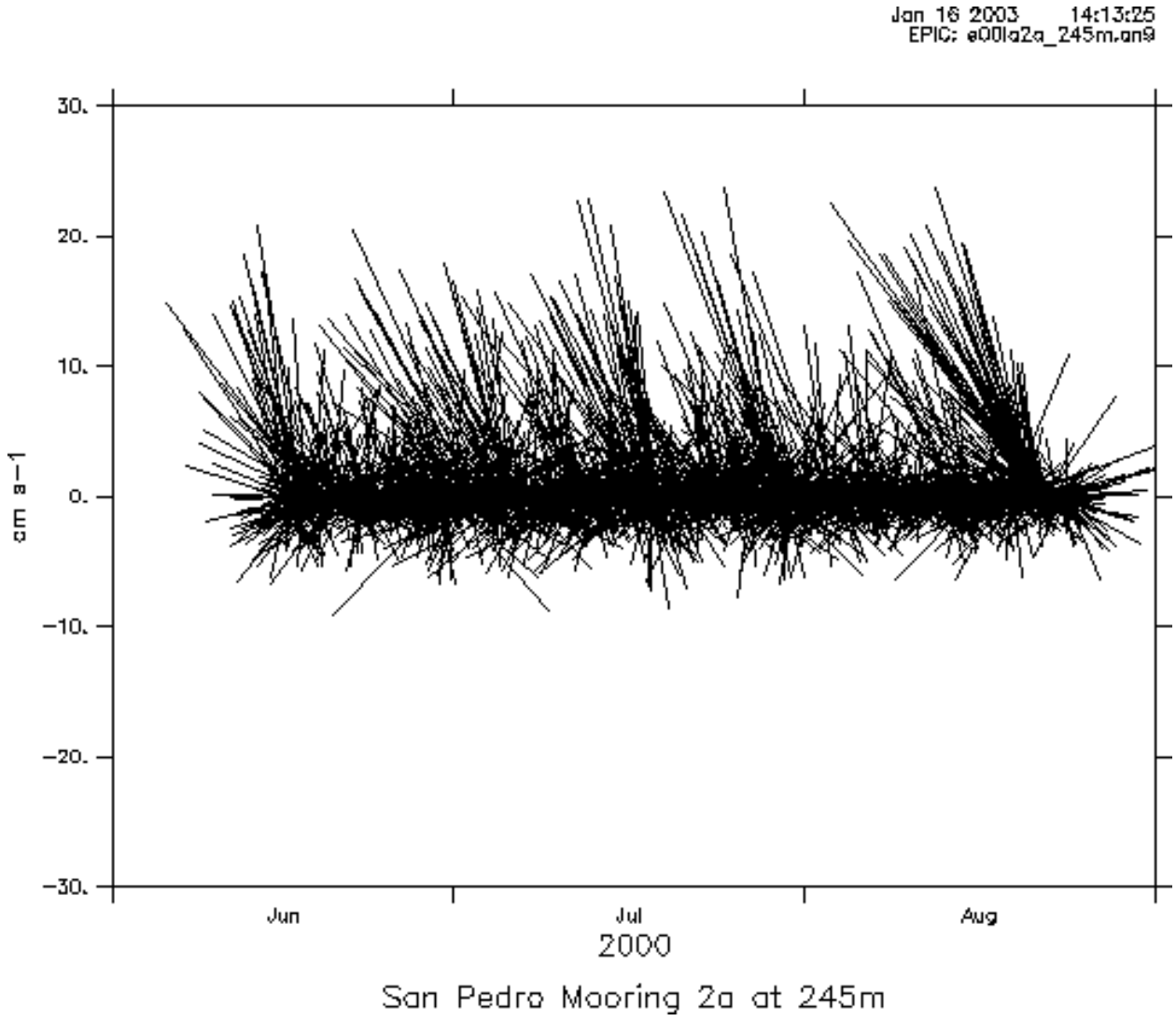
A3-10 through A3-11: Site 2, deployment 5 (245 m, Jun 2001-Nov 2001)

A3-12 through A3-13: Site 3, deployment 3 (437 m, Nov 2000-Jan 2001)

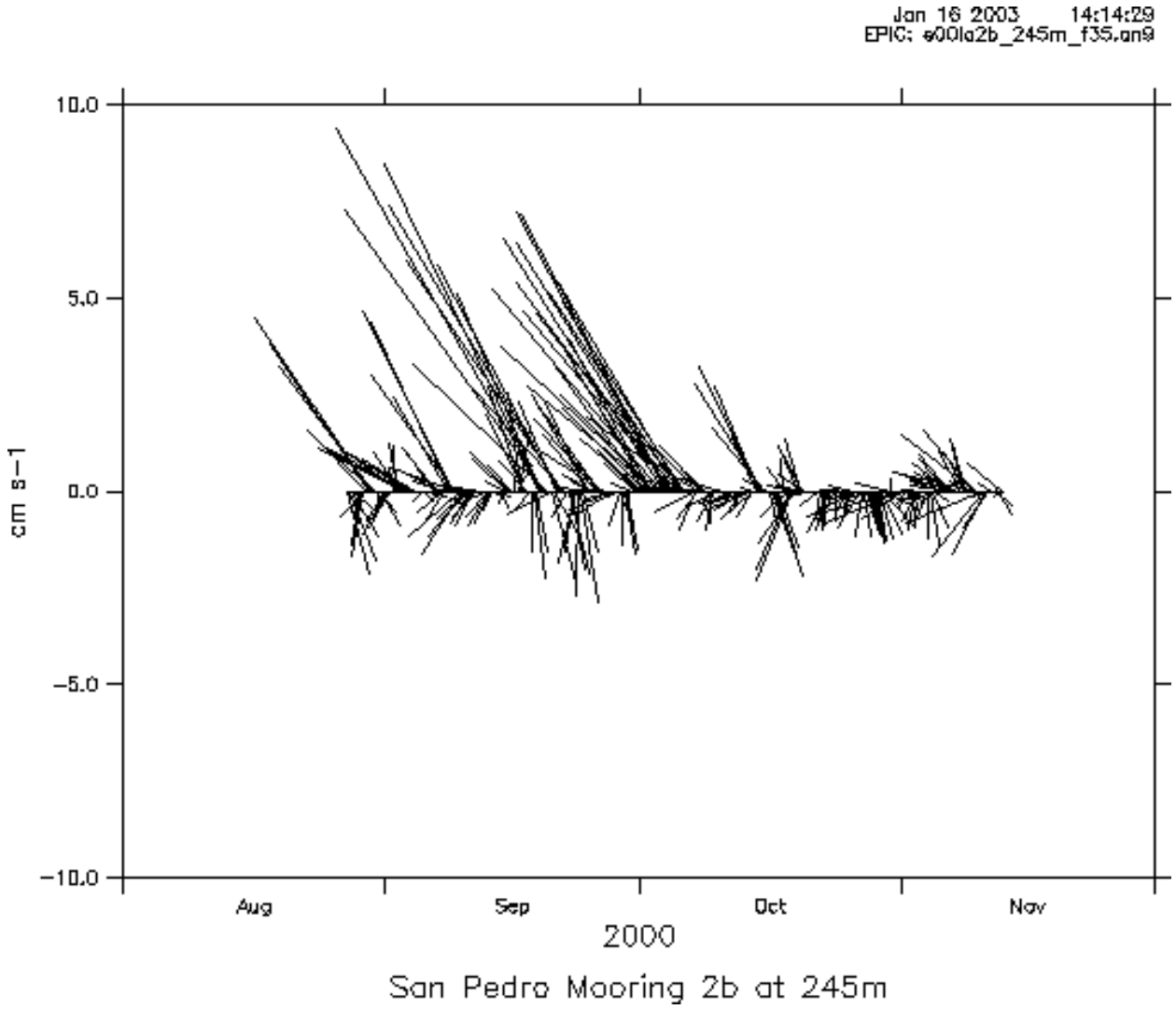
A3-14 through A3-15: Site 3, deployment 4 (435 m, Jan 2001-Jun 2001)

A3-16 through A3-17: Site 3, deployment 5 (444 m, Jun 2001-Nov 2001)


Jan 16 2003 14:13:56
EPIC: e001a2a_245m_f35.an9
15.0
10.0
5.0
0.0
−5.0
−10.0
−15.0
cm s−1
Jun
Jul
Aug
2000
San Pedro Mooring 2a at 245m



San Pedro Mooring 2a at 245m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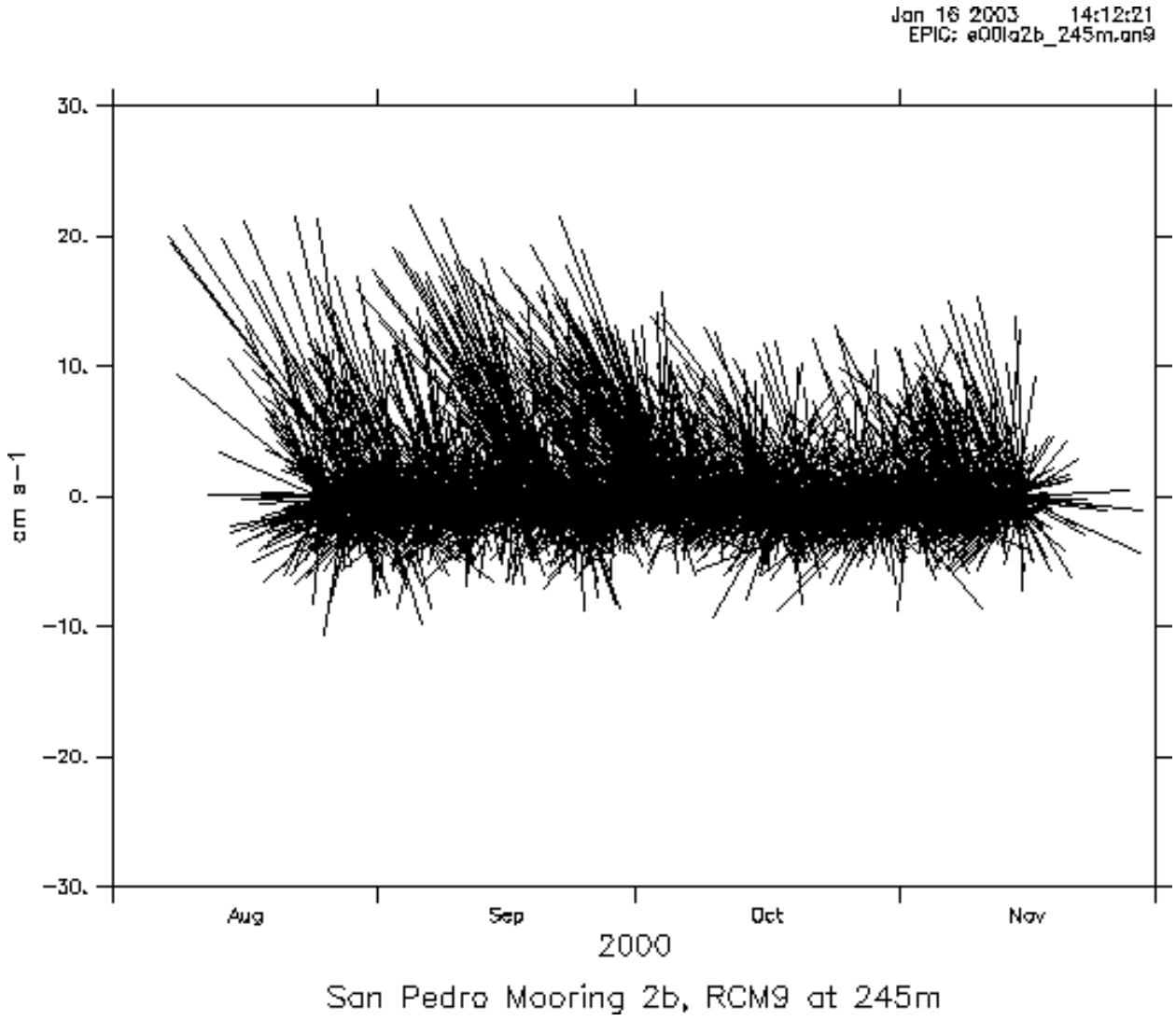
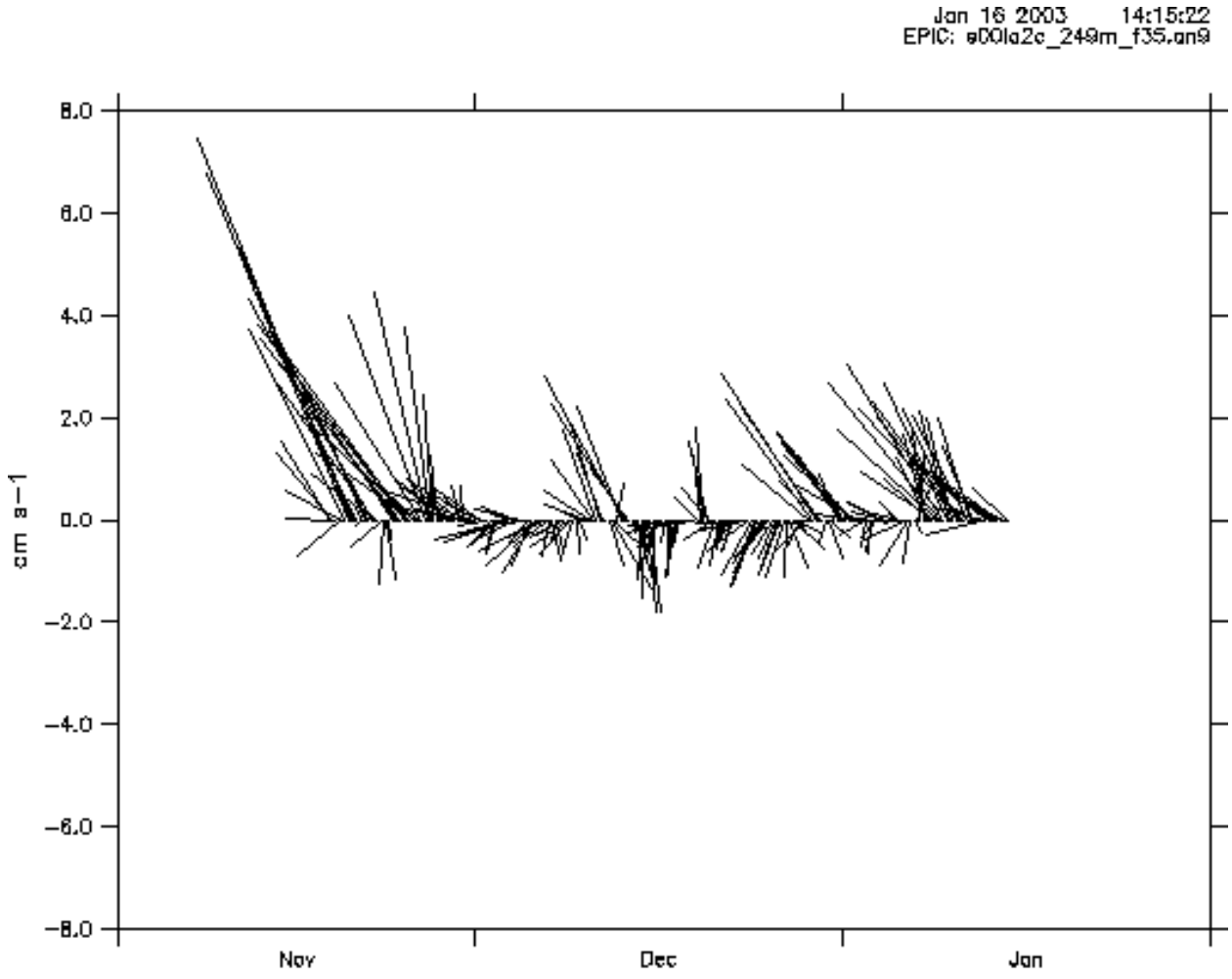
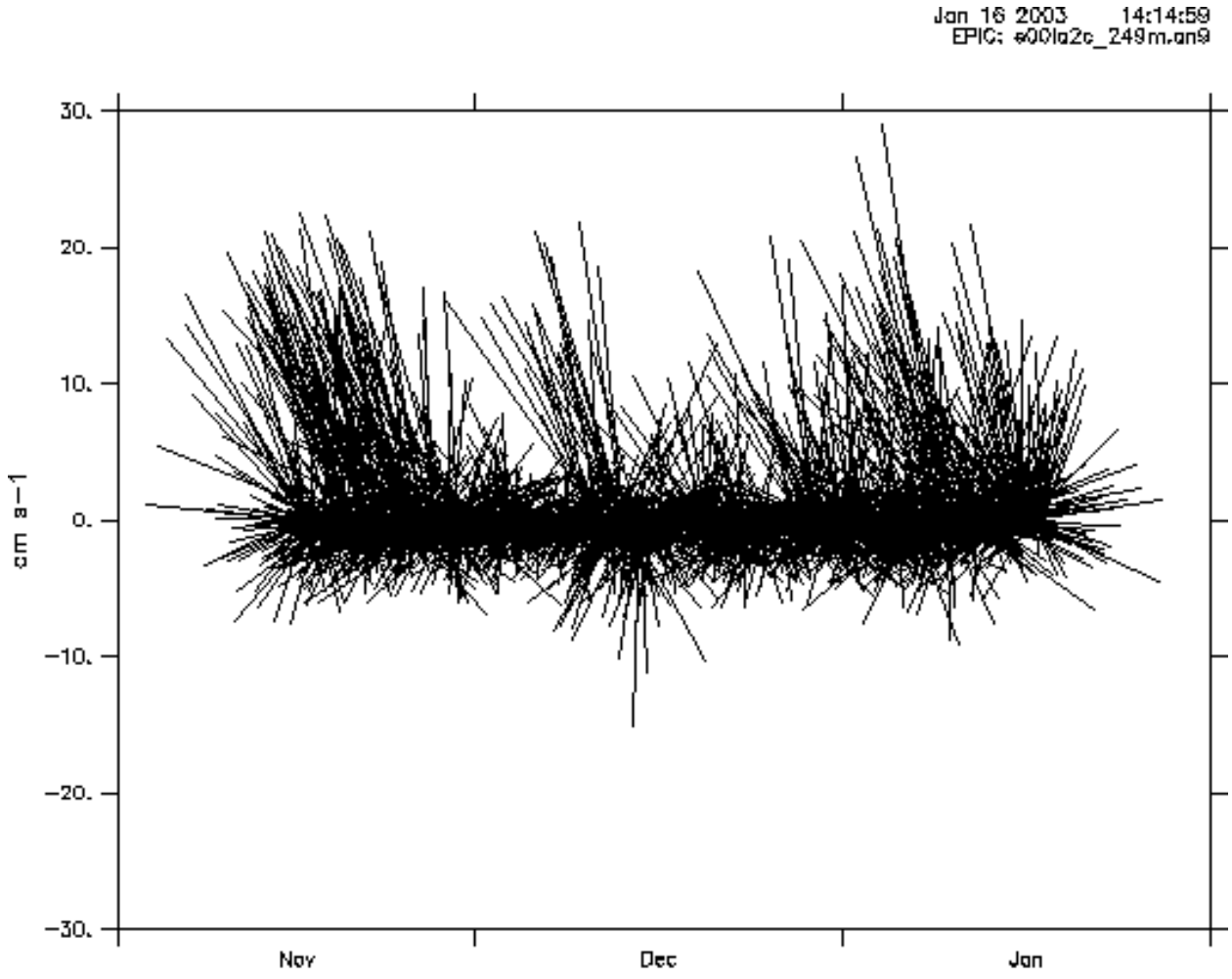
10.0
5.0
0.0
-5.0
-10.0
cm s-1
Aug
Sep
Oct
Nov
2000
San Pedro Mooring 2b at 245m



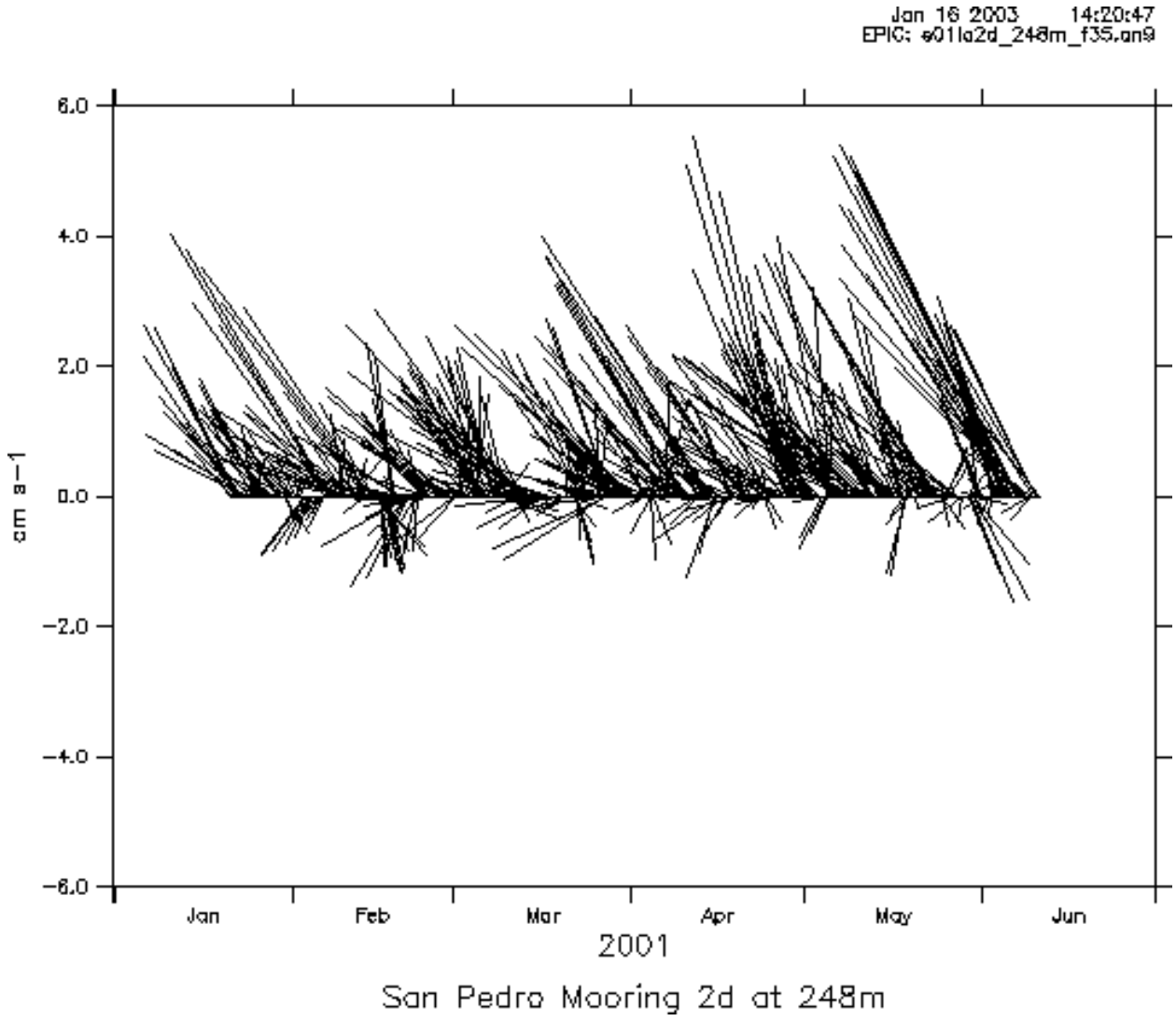
San Pedro Mooring 2b, RCM9 at 245m



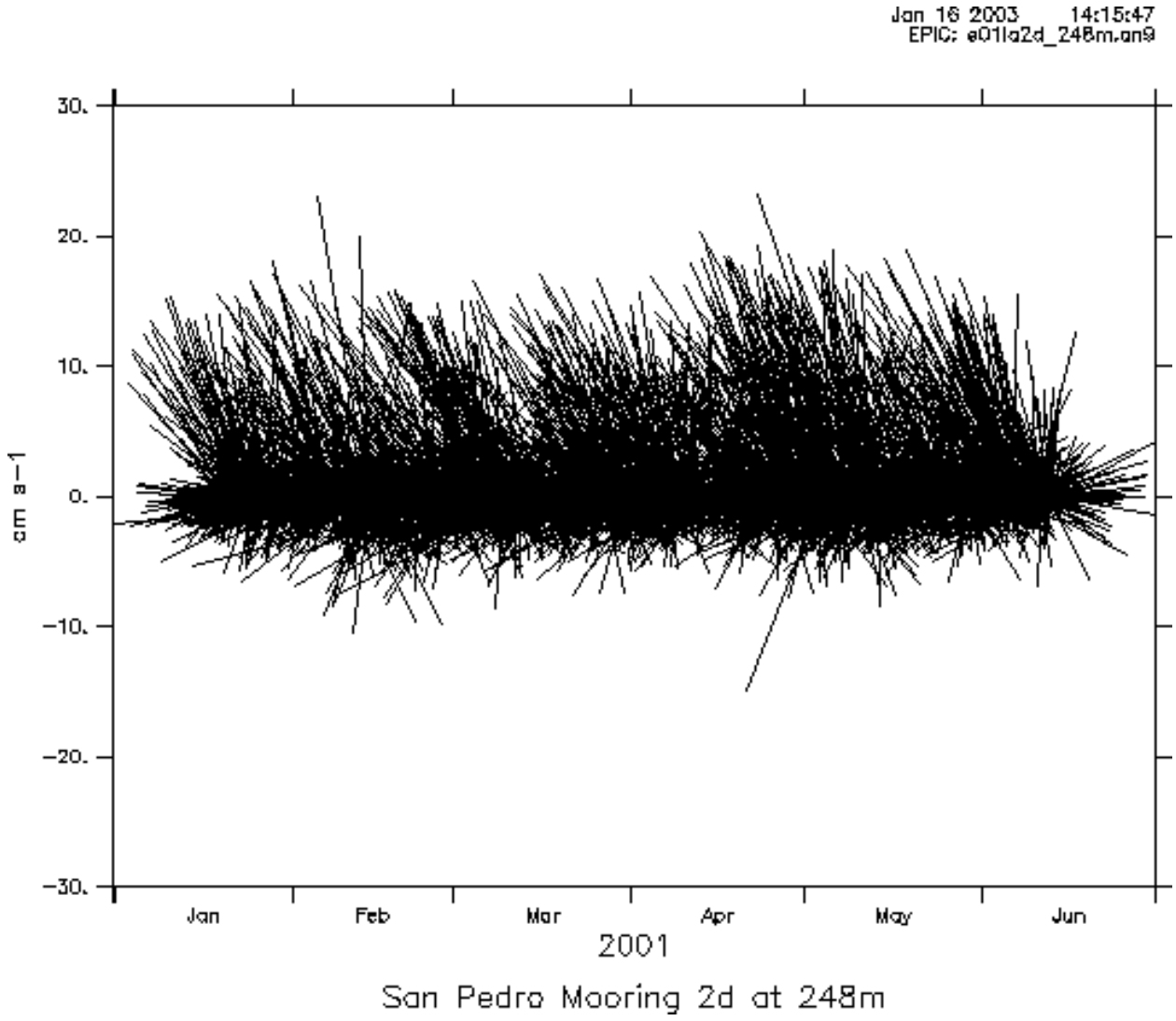
San Pedro Mooring 2c at 249m



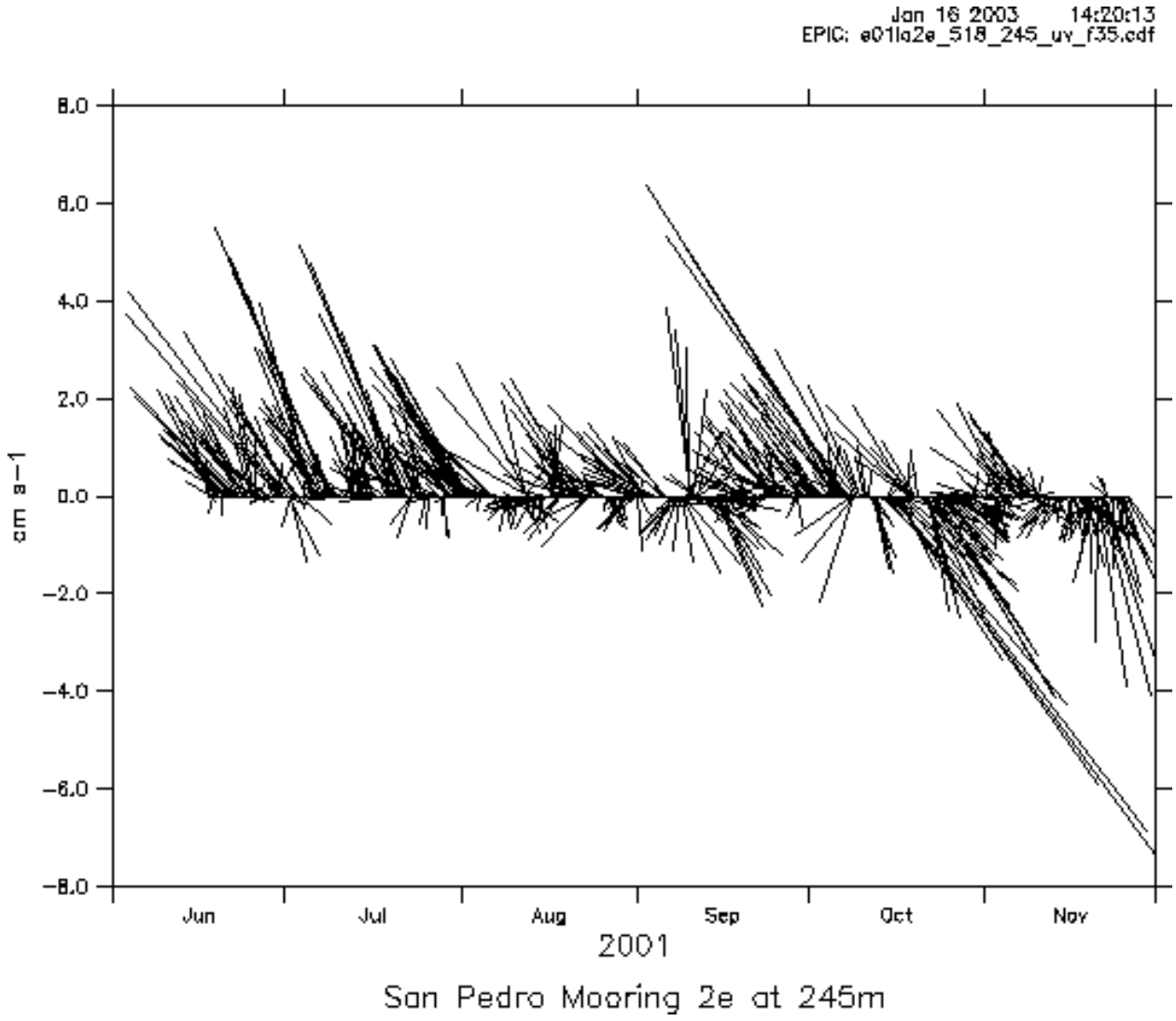
San Pedro Mooring 2c at 249m



San Pedro Mooring 2d at 248m



San Pedro Mooring 2d at 248m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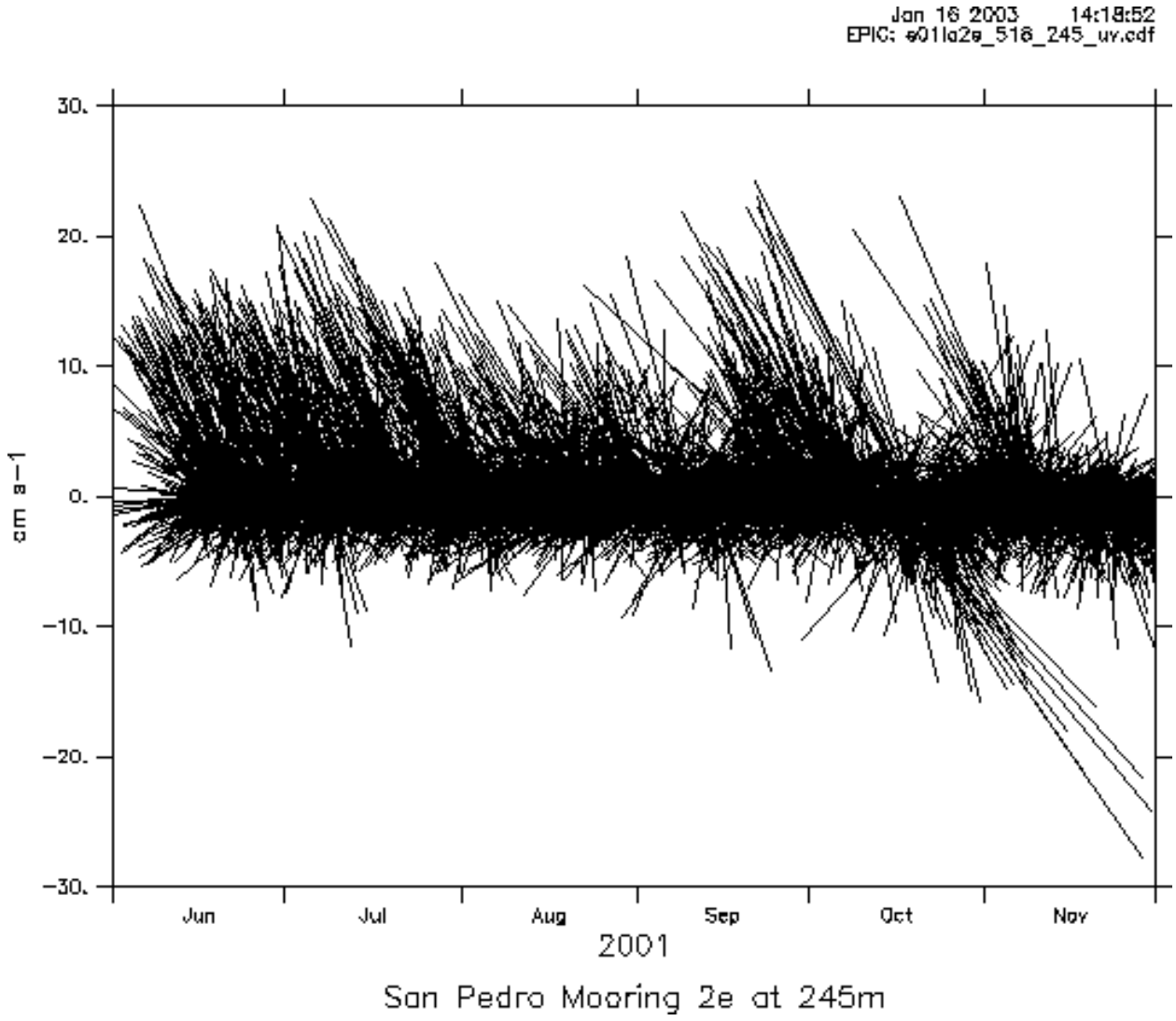
8.0
6.0
4.0
2.0
0.0
−2.0
−4.0
−6.0
−8.0
cm s−1
Jun
Jul
Aug
Sep
Oct
Nov
2001
San Pedro Mooring 2e at 245m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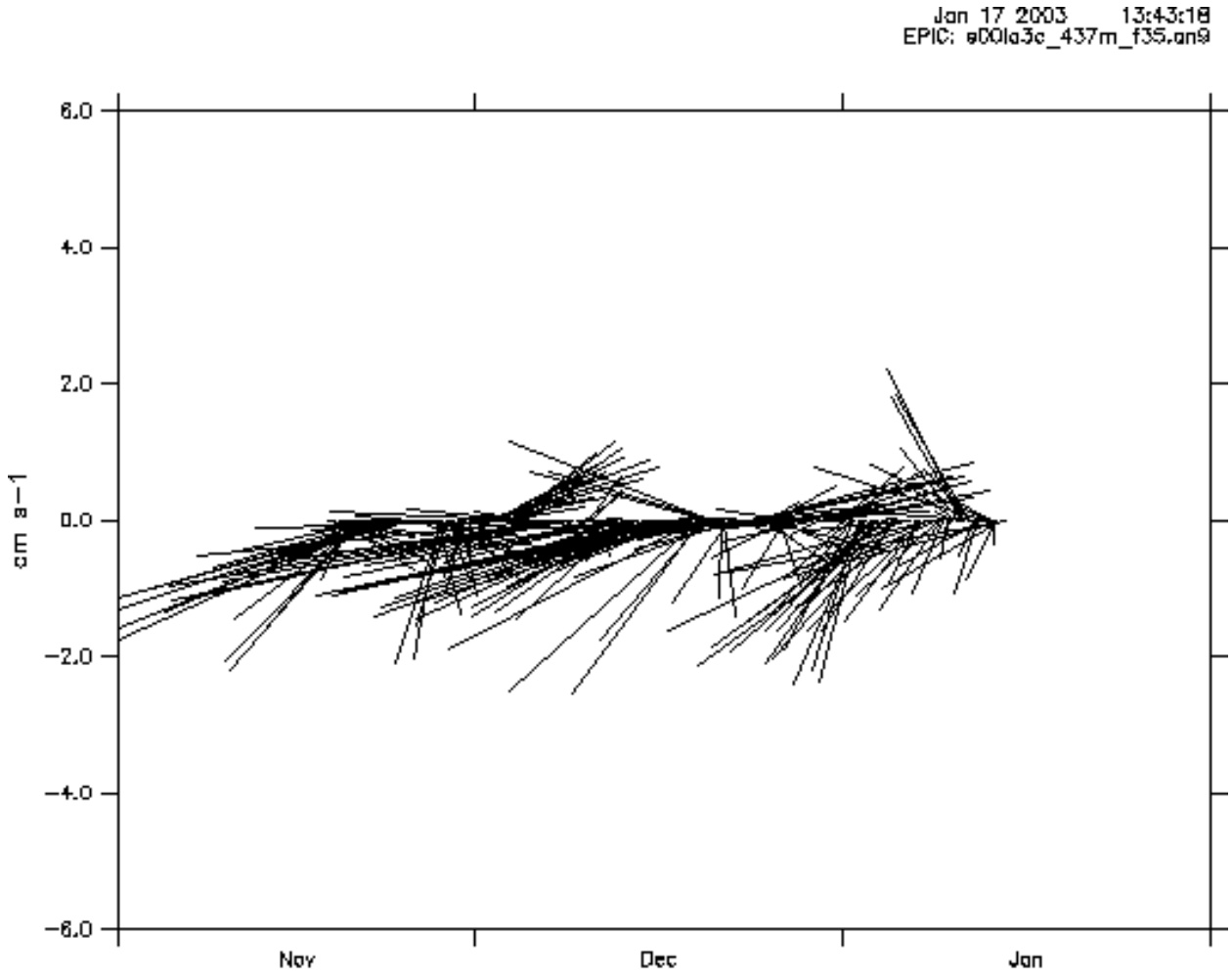
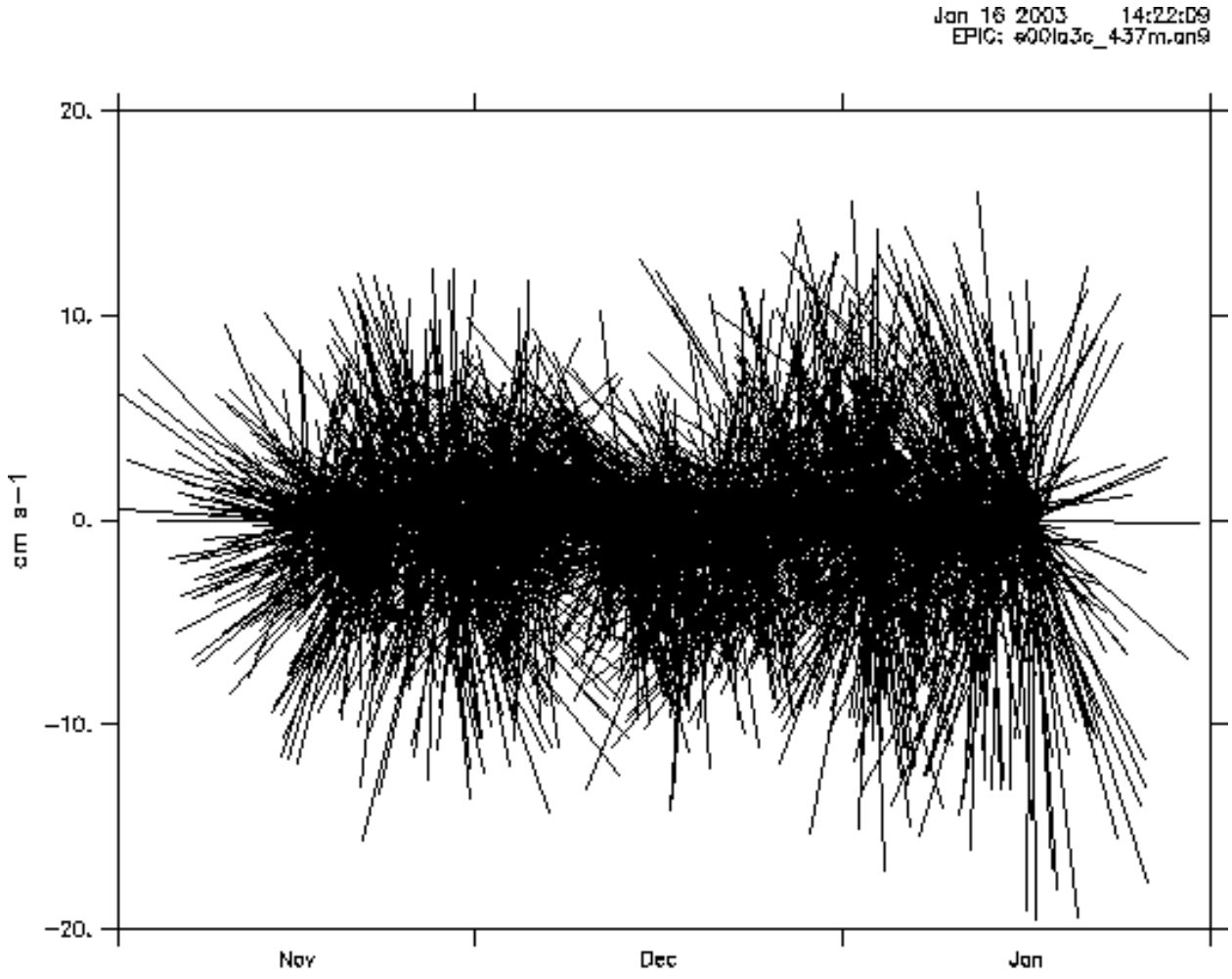
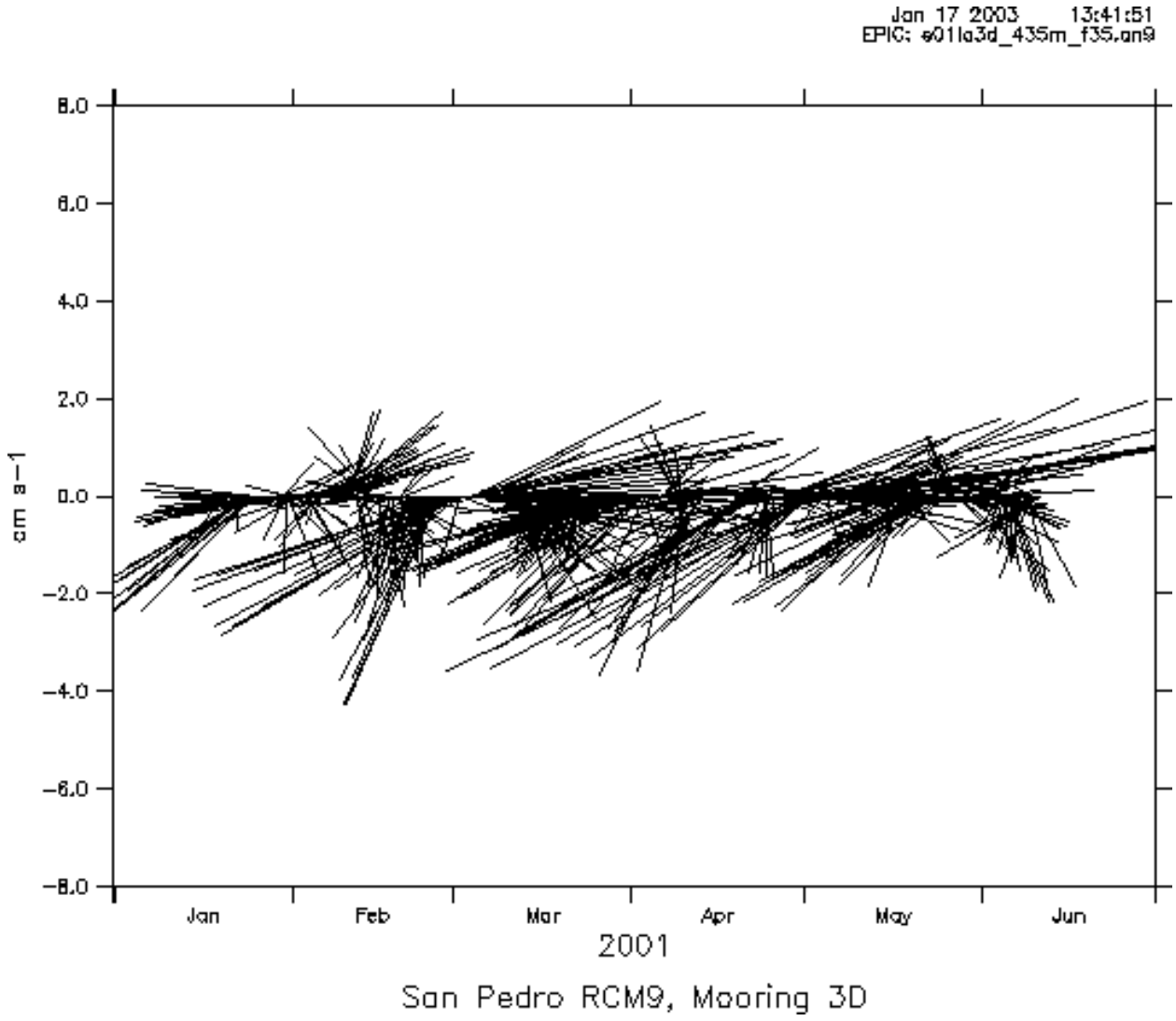
30.
20.
10.
0.
-10.
-20.
-30.
cm s-1
Jun
Jul
Aug
Sep
Oct
Nov
2001
San Pedro Mooring 2e at 245m



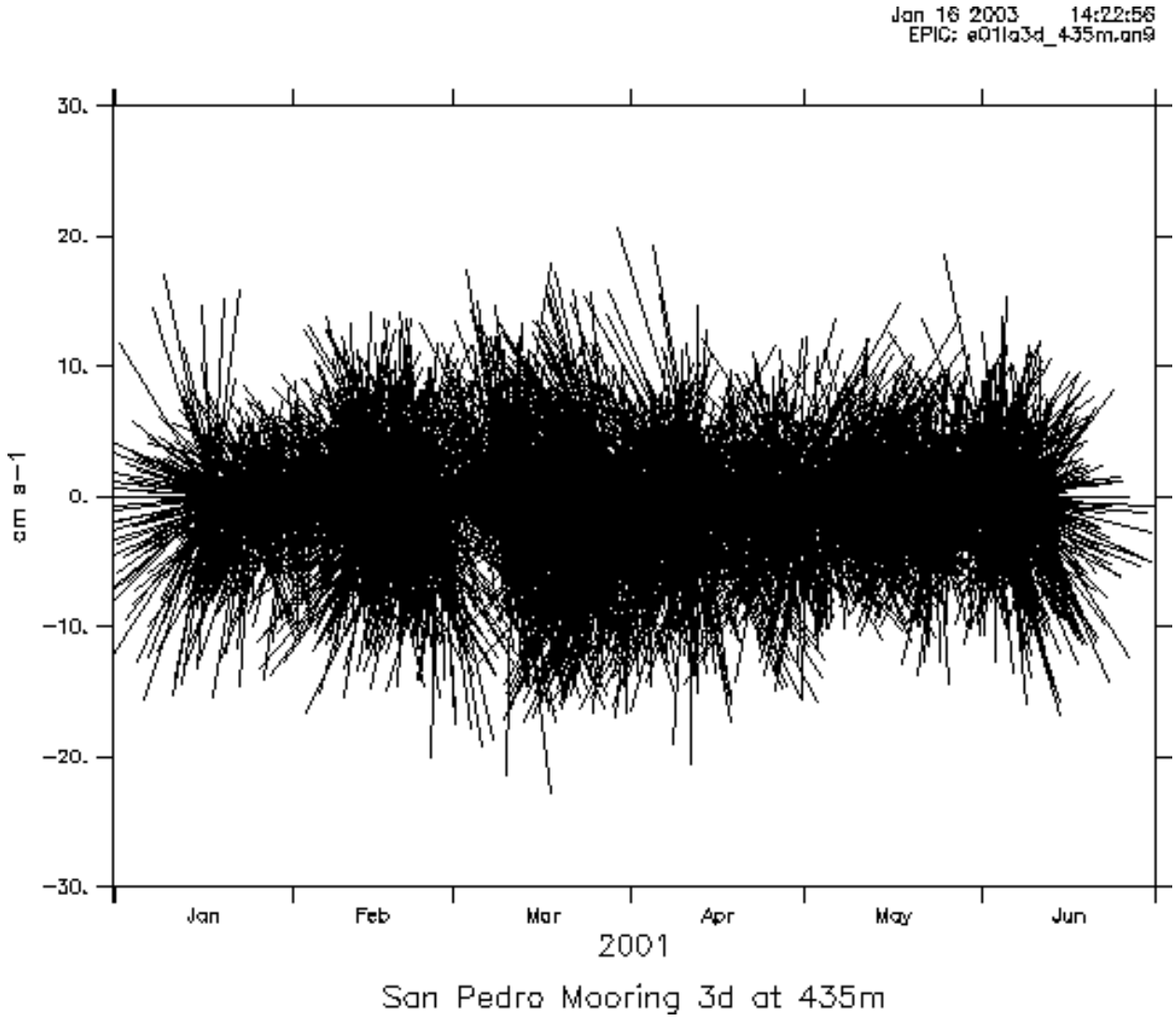
San Pedro RCM9, Mooring 3C



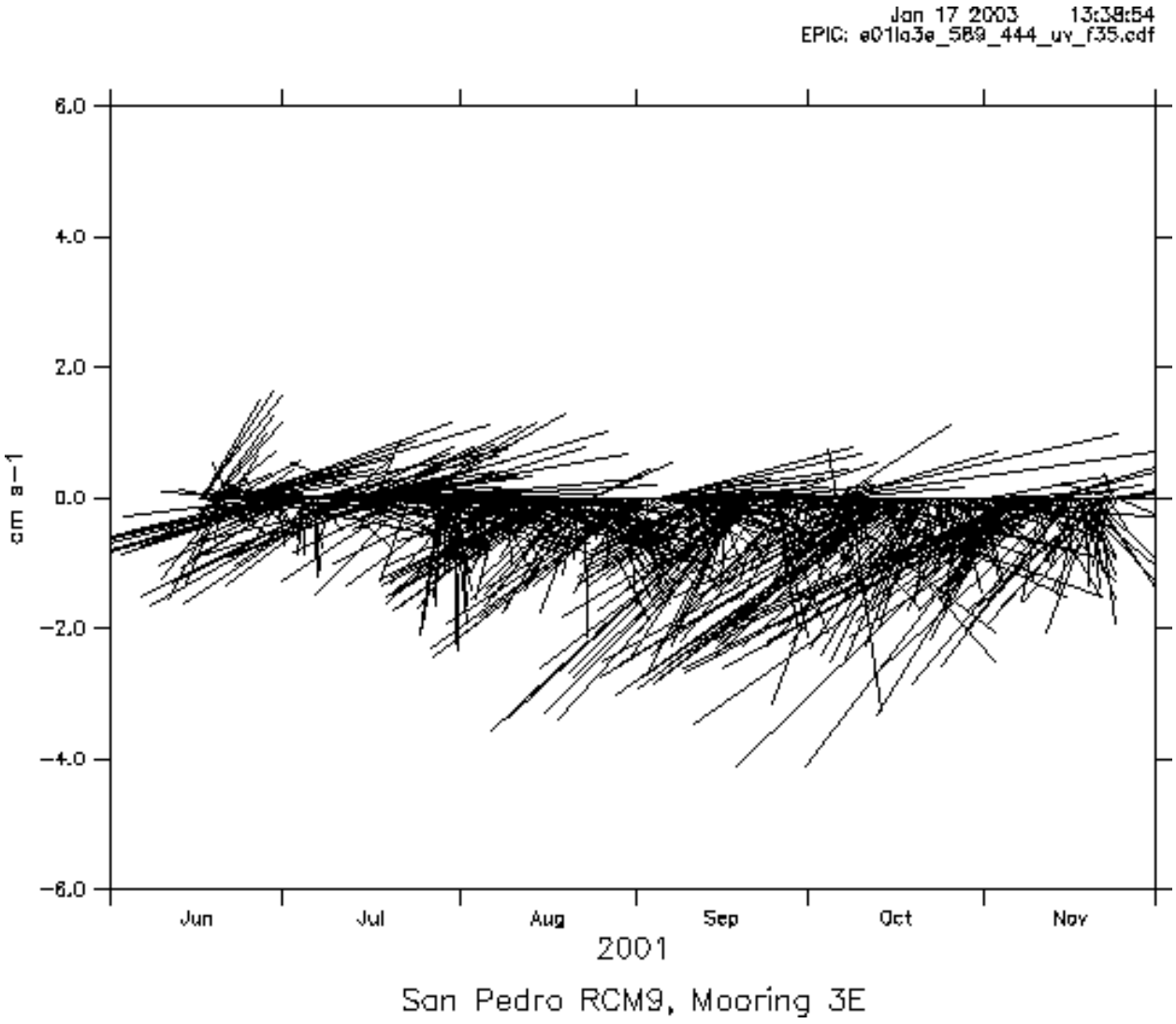
San Pedro Mooring 3c at 437m



San Pedro RCM9, Mooring 3D



San Pedro Mooring 3d at 435m


Jan 17 2003 13:38:54
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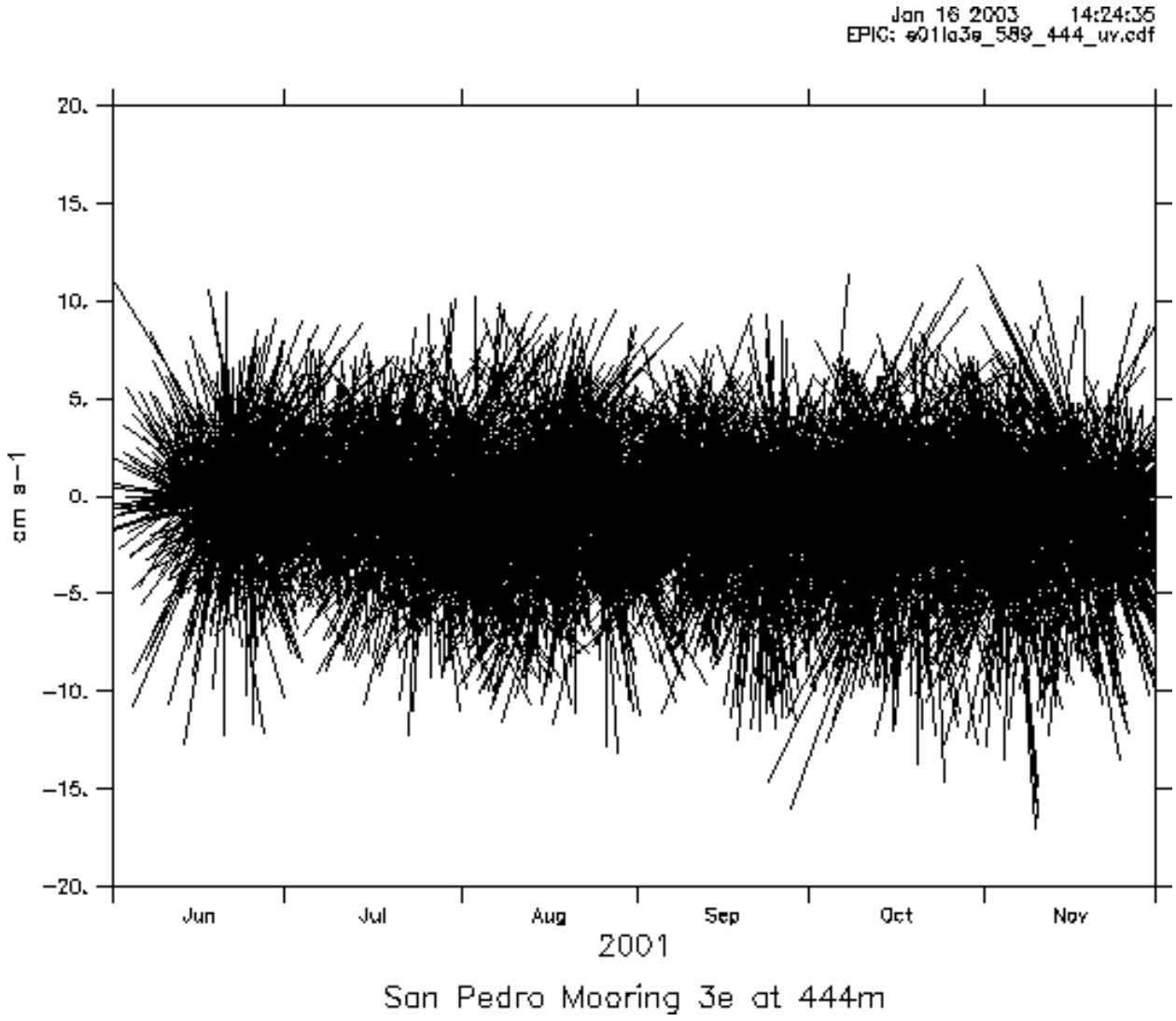
6.0
4.0
2.0
0.0
−2.0
−4.0
−6.0
cm s−1
Jun
Jul
Aug
Sep
Oct
Nov
2001
San Pedro RCM9, Mooring 3E


Jan 16 2003 14:24:35
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20.
15.
10.
5.
0.
−5.
−10.
−15.
−20.
cm s−1
Jun
Jul
Aug
Sep
Oct
Nov
2001
San Pedro Mooring 3e at 444m

Appendix 4. Cruise Reports

CRUISE REPORT

Cruise Number: LA00-01
Ship: SEA WATCH

Area of Operations: San Pedro Channel, California

Itinerary:

	Terminal Island, California	June 15, 2000
	Terminal Island, California	June 15, 2000

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

Rick Miller	M	PMEL
Paul Devine	M	RDI

Objectives of the Cruise:
1. Deploy two moorings at the San Pedro Channel study areas of LA-2 and LA-3.
2. Complete XBT's at the mooring locations.

Operations:

Mooring Deployments: 2

00LA-2A	33° 36.554'	118° 17.570'	in 250 meters of water
00LA-3A	33° 31.700'	117° 53.991'	in 447 meters of water

Mooring Recoveries: 0

XBT's: 4

Summary of Cruise:

The Sea Watch departed Terminal Island the morning of the 15th. of June for mooring site LA-3. Upon arriving at the mooring location, mooring 00LA-3A consisting of 1-75KHz ADCP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release was deployed in 447 meters of water in an anchor last operation. Two XBT's were taken at the mooring location after the deployment.

At mooring site LA-2 an identical mooring as the mooring at LA-3 was deployed in 250 meters of water. Two XBT's were taken at the mooring location after the deployment.

The Sea Watch returned to Terminal Island on the afternoon of the 15th.

Ship Operations:

The Sea Watch is operated by the Southern California Marine Institute at Terminal Island, California.

Contacts:

PMEL Operations:
William Parker
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7600 Sandpoint Way
Seattle, Wa. 98115
206-526-6180
parker@pmel.noaa.gov

Principle Investigator:
Dr. Phyllis Stabeno
PMEL/ FOCI
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Seattle, Wa. 98115
206-526-6180
stabeno@pmel,noaa,gov

US Army Corps of Engineers
Chuck Mesa
Attn: CESPL-ED-DC
911 Wilshire Blvd.
Los Angeles, Ca 90017
213-452-3678

DEPLOYMENT

Mooring I.D.:	00LA-2A	Deployment date (L):	6/15/00
Cruise No:	LA00-1	Deployment depth (m):	250
Project:	San Pedro	Time of release:	167 - 1938
SHIP:	SEA WATCH	Time on bottom:	167 - 1940
Chief Sci:	Bill Parker		
Timekeeper:	Bill Parker	Position	
		GPS latitude:	33° 36.554' N
CTD cast no.:	XBT	GPS longitude:	118° 17.57' W
Bottom temp:		Magnetic variation:	

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1296	167	19:35	240		237	15:50
RCM9	502	167	19:35	245		237	15:52

RECOVERY

Cruise number:	LA00-2
Time released fm anchor:	237 - 1535
Recovery time at surface:	237 - 1540
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	ORE		ORE
Size:	28"		28"
S/N:	576		631
Color:	yellow		yellow
Depth (m):	229		242

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	016565	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

DEPLOYMENT

Mooring I.D.:	00LA-3A	Deployment date (L):	6/15/00
Cruise No:	LA00-1	Deployment depth (m):	447
Project:	San Pedro	Time of release:	167 - 1708
SHIP:	SEA WATCH	Time on bottom:	167 - 1709
Chief Sci:	Bill Parker		
Timekeeper:	Bill Parker	Position	
		GPS latitude:	33° 31.70' N
CTD cast no.:	XBT	GPS longitude:	117° 53.991' W
Bottom temp:		Magnetic variation:	

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1318	167	17:04	437		252	23:45
RCM9	512	167	17:05	442		252	23:45

RECOVERY

Cruise number:	LA00-2
Time released fm anchor:	237 - 1948
Recovery time at surface:	none
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	ORE		ORE
Size:	28"		28"
S/N:	628		2674
Color:	yellow		yellow
Depth (m):	418		439

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	015655	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments: Recovered by ROV on cruise # LA00-3 (Christopher G) 9/8/00

FISHERIES OCEANOGRAPHY COORDINATED INVESTIGATIONS (FOCI) PROGRAM

CRUISE INSTRUCTIONS
FOR
AR-00-06 transit
July 21-22, 2000

FOCI Program Director
Dr. Phyllis Stabeno
NOAA/PMEL/OERD
7600 Sand Point Way NE
Seattle, WA 98115

Area: Coast of Southern California

Itinerary:

AR-00-06 (transit)	Port Hueneme, CA	Depart	21 July 2000
	San Diego, CA	Arrive	22 July 2000

CRUISE DESCRIPTION

Cruise Objective and Plan:

The objective of this cruise is to complete a CTD grid around two ADCP moorings in the San Pedro channel. Each grid will consist of four CTDs around the mooring at a distance of 2km and one CTD above the mooring.

MOP Operations:
LT Michael D. Francisco, NOAA
NOAA/MOP (MOP1x3)
1801 Fairview Ave. East
Seattle, WA 98102-3767
(206) 553-4886
mike.francisco@noaa.gov

PMEL Operations Manager:
LCDR Dave Mattens, NOAA
PMEL/OD
7600 Sand Point Way NE
Seattle, WA 98115-0070
(206) 526-4485
mattens@pmel.noaa.gov

2.0 OPERATIONS

2.1 CTD Operations

CTD Operations are scheduled to be conducted as shown. All CTD casts are to be taken down to a depth of 30m above the bottom. Operations will be conducted in the San Pedro channel.

CTD	Location	
CTD-LA-2 (NW)	33°37.6'N	118°18.3'W
CTD-00LA-02A (250M)	33°36.6'N	118°17.6'W
CTD-LA-2 (SW)	33°36.0'N	118°18.7'W
CTD-LA-2 (SE)	33°35.6'N	118°16.9'W
CTD-LA-2 (NE)	33°37.1'N	118°16.5'W
CTD-LA-3 (W)	33°31.7'N	117°55.3'W
CTD-LA-3 (N)	33°32.8'N	117°54.0'W
CTD-00LA-03A (447M)	33°31.7'N	117°54.0'W
CTD-LA-3 (S)	33°30.6'N	117°54.0'W
CTD-LA-3 (E)	33°31.7'N	117°52.7'W

Principal investigators:
Dr Phyllis Stabeno, PMEL 206-526-6453 stabeno@pmel.noaa.gov

CRUISE REPORT

Cruise Number: LA00-02
Ship: YELLOWFIN

Area of Operations: San Pedro Channel, California

Itinerary:

Terminal Island, California	August 24, 2000
Terminal Island, California	August 24, 2000

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

William Floering	M	PMEL
Dave Kahel	M	PMEL
Chuck Mesa	M	COE
Paul Devine	M	RDI

Objectives of the Cruise:
1. Recover and Deploy two moorings at the San Pedro Channel study areas of LA-2 and LA-3.
2. Complete XBT's at the mooring locations.

Operations:

Mooring Deployments: 1

00LA-2B	33° 36.554'	118° 17.575'	in 254 meters of water

Mooring Recoveries 1

00LA-2A	33° 36.554'	118° 17.570'	in 250 meters of water

XBT's: 2

Summary of Cruise:
The research vessel Yelowfin departed Terminal Island the morning of the 24th. of August for mooring site LA-2. Upon arriving at the mooring location, mooring 00LA-2A consisting of 1-75KHz ADCP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release was recovered. Data was recovered from the ADCP and current meter. Mooring (00LA-2B was then deployed in 254 meters of water in an anchor last operation. An XBT's was taken at the mooring location.

At mooring site LA-3, mooring 00LA-3A responded to release commands but did not surface. Acoustic testing showed the mooring remained on the sea floor and did not appear to move or drift from it's original moored location. The mooring recovery will be attempted on a later cruise.

The Yellowfin returned to Terminal Island on the afternoon of the 24th.

Ship Operations:
The Yellowfin is operated by the Southern California Marine Institute at Terminal Island, California.

Contacts:

PMEL Operations:
William Parker
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7600 Sandpoint Way
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206-526-6180
parker@pmel.noaa.gov

Principle Investigator:
Dr. Phyllis Stabeno
PMEL/ FOCI
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206-526-6180
stabeno@pmel,noaa,gov

US Army Corps of Engineers
Chuck Mesa
Attn: CESPL-ED-DC
911 Wilshire Blvd.
Los Angeles, Ca 90017
213-452-3678

DEPLOYMENT

Mooring I.D.:	00LA-2B	Deployment date (L):	8/24/00
Cruise No:	LA00-2	Deployment depth (m):	254
Project:	San Pedro	Time of release:	237 - 1740
SHIP:	Yellowfin	Time on bottom:	237 - 1742
Chief Sci:	Bill Parker		
Timekeeper:	Dave Kachel	Position	
		GPS latitude:	33° 36.550' N
CTD cast no.:		GPS longitude:	118° 17.575' W
Bottom temp:		Magnetic variation:	13.6° E

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1296	237	17:28	240		320	23:10
RCM9	518	237	17:33	245		320	23:15

RECOVERY

Cruise number:	LA00-3
Time released fm anchor:	320 - 2255
Recovery time at surface:	320 - 2258
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	ORE		ORE
Size:	28"		28"
S/N:	576		631
Color:	yellow		yellow
Depth (m):	235		248

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	016565	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

CRUISE REPORT

Cruise Number: LA00-03
Ship: CHRISTOPHER G.

Area of Operations: San Pedro Channel, California

Itinerary:

	Long Beach, California	September 6, 2000
	Long Beach, California	September 8, 2000

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)
Cabaco Marine Int'l Inc.

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

William Floering	M	PMEL
Joe Caba	M	Cabaco
Technician	M	Cabaco
Technician	M	Cabaco

Objectives of the Cruise:
1. Remote Operated Vehicle operations to recover mooring 00LA-3A.

Operations:
Mooring Recoveries 1

00LA-3A	33° 31.700'	117° 53.991'	in 447 meters of water

Summary of Cruise:
On the morning of September 6th the Cabaco Sea Rover Remotely Operated Vehicle and appurtenant equipment (electronics van & tether cable) were loaded on and tested for operation aboard the Christopher G. The Christopher G. sailed from Long Beach at 13:30 in route to site LA-3. Attempted one ROV dive late on the 6th, but failed to reach the bottom because of a warning alarm sounded at 650 feet of depth and the ROV had be recovered to investigate the cause of the alarm. The ship arrived back at Long Beach at 02:30.

The second day of operations was on September 8th. The Christopher G. Departed from Long Beach at 08:00 for site LA-3. ROV deployment at site 3 began at 12:00. ROV reached the sea floor at 1527 feet and began sonar search for the mooring. After locating the mooring the video reveled that the lower 28" float had imploded and had lost it's ability to provide flotation to raise the mooring to the surface. The upper float was intact and supporting the ADCP frame upright in the water column, but the RCM-9 current meter and the acoustic release were laying on the sea floor and on top of the anchor. The ROV attached a recovery line through the chain below the ADCP frame, which allowed for the recovery of mooring 00LA-3A. The three instruments were recovered and data was later recovered from the ADCP and the current meter. The ship, ROV and equipment returned to Long Beach at 20:00.

Ship Operations:
The Christopher G. is owned and operated by Sylvester Tug Service Co. in Long Beach, California.

Contacts:

PMEL Operations:
William Parker
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7600 Sandpoint Way
Seattle, Wa. 98115
206-526-6180
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Principle Investigator:
Dr. Phyllis Stabeno
PMEL/ FOCI
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stabeno@pmel,noaa,gov

US Army Corps of Engineers
Chuck Mesa
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911 Wilshire Blvd.
Los Angeles, Ca 90017
213-452-3678

CRUISE REPORT

Cruise Number: LA00-04
Ship: YELLOWFIN

Area of Operations: San Pedro Channel, California

Itinerary:

	Terminal Island, California	November 15, 2000
	Terminal Island, California	November 15, 2000

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

William Floering	M	PMEL
Chuck Mesa	M	COE

Objectives of the Cruise:
1. Deploy one mooring at the San Pedro Channel study area LA-3.
2. Recover and re-deploy one mooring at the San Pedro Channel study area LA-2.
2. Complete XBT's at the mooring locations.

Operations:

Mooring Deployments: 2

00LA-3C	33° 31.753'	117° 54.040'	in 442 meters of water
00LA-2C	33° 36.552'	118° 17.597'	in 255 meters of water

Mooring Recoveries 1

00LA-2B	33° 36.550'	118° 17.575'	in 254 meters of water

XBT's: 3

Summary of Cruise:
The research vessel Yelowfin departed Terminal Island the morning of the 15th. Of November for mooring site LA-3. Upon arriving at the mooring site, mooring 00LA-3C consisting of 1-75KHz ADCP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release was deployed in an anchor last operation. Two XBT's were taken at the mooring location.

At mooring site LA-2, mooring 00LA-2B was recovered. The data recorded from the ADCP and RCM-9 current meter were recovered and the the instruments were setup for deployment. Mooring 00LA-2C was then deployed at the same position. An XBT was taken at the mooring position.

The Yellowfin returned to Terminal Island on the afternoon of the 15th.

Ship Operations:
The Yellowfin is operated by the Southern California Marine Institute at Terminal Island, California.

Contacts:

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7600 Sandpoint Way
Seattle, Wa. 98115
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Principle Investigator:
Dr. Phyllis Stabeno
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7600 Sandpoint Way
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US Army Corps of Engineers
Chuck Mesa
Attn: CESPL-ED-DC
911 Wilshire Blvd.
Los Angeles, Ca 90017
213-452-3678

DEPLOYMENT

Mooring I.D.:	00LA-2C	Deployment date (L):	11/15/00
Cruise No:	LA00-4	Deployment depth (m):	255
Project:	San Pedro	Time of release:	321 - 0012
SHIP:	Yellowfin	Time on bottom:	
Chief Sci:	Bill Parker		
Timekeeper:	Bill Parker	Position	
		GPS latitude:	33° 36.552' N
CTD cast no.:	XBT	GPS longitude:	118° 17.597' W
Bottom temp:		Magnetic variation:	

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1296	321	00:03			017	22:00
RCM9	518	321	00:10	249		017	22:01

RECOVERY

Cruise number:	LA01-1
Time released fm anchor:	017 - 2154
Recovery time at surface:	017 - 2156
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	ORE		ORE
Size:	28"		30"
S/N:	631		none
Color:	yellow		yellow
Depth (m):	234		247

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	016565	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

DEPLOYMENT

Mooring I.D.:	00LA-3C	Deployment date (L):	11/15/00
Cruise No:	LA00-4	Deployment depth (m):	442
Project:	San Pedro	Time of release:	320 - 1925
SHIP:	Yellowfin	Time on bottom:	
Chief Sci:	Bill Parker		
Timekeeper:	Bill Parker	Position	
		GPS latitude:	33° 31.753' N
CTD cast no.:	XBT	GPS longitude:	117° 54.040' W
Bottom temp:		Magnetic variation:	

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1318	320	19:20	432		017	17:34
RCM9	502	320	19:22	437		017	17:36

RECOVERY

Cruise number:	LA01-1
Time released fm anchor:	017 - 1723
Recovery time at surface:	017 - 1728
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	F.T.		glass (6)
Size:	30"		
S/N:	none		none
Color:	orange		yellow
Depth (m):	437		434

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	20991	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

CRUISE REPORT

Cruise Number: LA01-01
Ship: Seawatch

Area of Operations: San Pedro Channel, California

Itinerary:

Terminal Island, California	January 17, 2001
Terminal Island, California	January 18, 2001

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

William Floering	M	PMEL

Objectives of the Cruise:
1. Recover and re-deploy one mooring at the San Pedro Channel study area LA-3.
2. Recover and re-deploy one mooring at the San Pedro Channel study area LA-2.

Operations:

Mooring Recovered: 2

00LA-3C	33° 31.753'	117° 54.040'	in 442 meters of water
00LA-2C	33° 36.552'	118° 17.597'	in 255 meters of water

Mooring Deployed: 1

01LA-3D	33° 31.694'	117° 54.050'	in 445 meters of water
01LA-2D	33° 36.554'	118° 17.596'	in 254 meters of water

XBT's: 3

Summary of Cruise:
The research vessel Seawatch departed Terminal Island the morning of the 17th. of January for mooring site LA-3. Upon arriving at the mooring site, mooring 00LA-3C consisting of 1-75KHz ADCP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release was recovered. Data was recovered from both the ADCP and RCM-9. Mooring 01LA-3D was then deployed at the same position.

At mooring site LA-2, mooring 00LA-2C was recovered. The data recorded from the ADCP and RCM-9 current meter were recovered. The Seawatch returned to Terminal Island with the 00LA-2C instruments. The instruments were serviced (batteries replaced in the ADCP and RCM-9) that night for the next days deployment. On the morning of January 18th, mooring 01LA-2D was deployed at the LA-2 mooring site.

The Seawatch returned to Terminal Island on the after the LA-2 deployment.

Ship Operations:
The Seawatch is operated by the Southern California Marine Institute at Terminal Island, California.

Contacts:

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Principle Investigator:
Dr. Phyllis Stabeno
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US Army Corps of Engineers
Chuck Mesa
Attn: CESPL-ED-DC
911 Wilshire Blvd.
Los Angeles, Ca 90017
213-452-3678

DEPLOYMENT

Mooring I.D.:	00LA-2C	Deployment date (L):	11/15/00
Cruise No:	LA00-4	Deployment depth (m):	255
Project:	San Pedro	Time of release:	321 - 0012
SHIP:	Yellowfin	Time on bottom:	
Chief Sci:	Bill Parker		
Timekeeper:	Bill Parker	Position	
		GPS latitude:	33° 36.552' N
CTD cast no.:	XBT	GPS longitude:	118° 17.597' W
Bottom temp:		Magnetic variation:	

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1296	321	00:03			017	22:00
RCM9	518	321	00:10	249		017	22:01

RECOVERY

Cruise number:	LA01-1
Time released fm anchor:	017 - 2154
Recovery time at surface:	017 - 2156
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	ORE		ORE
Size:	28"		30"
S/N:	631		none
Color:	yellow		yellow
Depth (m):	234		247

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	016565	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

DEPLOYMENT

Mooring I.D.:	00LA-3C	Deployment date (L):	11/15/00
Cruise No:	LA00-4	Deployment depth (m):	442
Project:	San Pedro	Time of release:	320 - 1925
SHIP:	Yellowfin	Time on bottom:	
Chief Sci:	Bill Parker		
Timekeeper:	Bill Parker	Position	
		GPS latitude:	33° 31.753' N
CTD cast no.:	XBT	GPS longitude:	117° 54.040' W
Bottom temp:		Magnetic variation:	

		Deployment				Recovery	
Instrument	Serial Number	JD	Time	Depth		JD	Time
RDI 75 KHz ADCP	1318	320	19:20	432		017	17:34
RCM9	502	320	19:22	437		017	17:36

RECOVERY

Cruise number:	LA01-1
Time released fm anchor:	017 - 1723
Recovery time at surface:	017 - 1728
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	F.T.		glass (6)
Size:	30"		
S/N:	none		none
Color:	orange		yellow
Depth (m):	437		434

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	20991	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

FISHERIES OCEANOGRAPHY COORDINATED INVESTIGATIONS (FOCI) PROGRAM

FINAL CRUISE INSTRUCTIONS
FOR
KA-01-04 transit San Diego, CA - Honolulu, HI
May10-20 2001

FOCI Program Director
Dr. Phyllis Stabeno
NOAA/PMEL/OERD
7600 Sand Point Way NE
Seattle, WA 98115

Area: Coast of Southern California with transit to Honolulu, Hawaii.

Itinerary:

KA-01-04 (transit)	San Diego, CA		Depart: 10 May 2001
	Honolulu, HI	Arrive: 20 May 2001	

CRUISE DESCRIPTION
General guidelines are contained in the TAO Program Standard Operating Instructions for NOAA Ship *KA'IMIMOANA* dated June 9, 2000.

Cruise Objective and Plan:

The objective of this cruise is to complete a CTD grid around two ADCP moorings in the San Pedro channel. Each grid will consist of four CTD's around the mooring at a distance of 2km and one CTD above the mooring. After completion of the CTD grid transit to Honolulu, Hawaii with continuous underway surface water sampling as outlined in section 2.2 below.

MOC-Pacific Operations:
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1.0 PERSONNEL

1.1 *CHIEF SCIENTIST AND PARTICIPATING SCIENTISTS*:

Chief Scientist: Donald Shea

The Chief Scientist is authorized to revise or alter the scientific portion of the cruise plan as work progresses provided that, after consultation with the Commanding Officer, it is ascertained that the proposed changes will not: (1) jeopardize the safety of personnel or the ship; (2) exceed the overall time

allotted for the cruise; (3) result in undue additional expenses; (4) alter the general intent of these instructions. A list of participating scientists follows in this set of specific cruise instructions. All participating scientists will submit a medical history form and be medically approved before embarking.

Participating Scientists

	Name	Sex	Nationality	Affiliation
1.	Donald Shea	M	USA	NASA
2.	Frank Sanchez	M	USA	CMA Cadet
3.	Teresa J. Kennedy	F	USA	Teacher at Sea, University of Idaho

2.0 OPERATIONS

2.1 *CTD Operations*

CTD Operations are scheduled to be conducted as shown. All CTD casts are to be taken down to a depth of 30m above the bottom. Water samples on first and last cast for calibration. Operations will be conducted in the San Pedro channel.

CTD	Location	
CTD-LA-3 (E)	33°31.7' N	117°52.7' W
CTD-LA-3 (S)	33°30.6' N	117°54.0' W
CTD-00LA-03A (447M)	33°31.7' N	117°54.0' W
CTD-LA-3 (N)	33°32.8' N	117°54.0' W
CTD-LA-3 (W)	33°31.7' N	117°55.3' W
CTD-LA-2 (SE)	33°35.6' N	118°16.9' W
CTD-LA-2 (NE)	33°37.1' N	118°16.5' W
CTD-00LA-02A (250M)	33°36.6' N	118°17.6' W
CTD-LA-2 (SW)	33°36.0' N	118°18.7' W
CTD-LA-2 (NW)	33°37.6' N	118°18.3' W

Principal investigators:
Dr Phyllis Stabeno, PMEL 206-526-6453 stabeno@pmel.noaa.gov

2.2 *Fluorometer (Behrenfeld/Shea)*

2.2.1 *Fast Repetition Rate Fluorometer*

The core measurement for this NASA research project is the analysis of variable fluorescence using a bench-top fast repetition rate fluorometer (FRR). The FRR measurements are conducted using the ship's continuous flow through of clean uncontaminated sea water (requirement: .200mL per minute). During the September 2000 cruise (KA-00-07), we set up the FRR on a homemade bench near the sink in the wet-lab. This was an ideal location for the instrument because it allows for disposal of the measured seawater. Other locations could also work equally well.

We plan to conduct FRR measurements on cruises: KA-01-04 (San Diego-Honolulu transit) and KA-01-06 (165E/180) . The FRR measurements should require little or no assistance from ship personnel, nor interfere with the ship's transit and/or TAO mooring operations.

2.2.2 *Solar Irradiance*

A Licor Data Logger (LDL) will be used to simultaneously log daily changes in solar irradiance. After consultation with the Field Operations Officer the solar sensor will be mounted in an acceptable exterior location free of shading. The LDL recorder will be enclosed from the weather, while the sensor itself is water resistant and will be exposed to the elements. During KA-00-07, we found that the overhead of the starboard aft control station was an ideal location for the Licor sensor. The sensor is very small (1" x 7/8") and the LDL recorder is 9" x 5". Solar irradiance data will be collected on KA-01-04 and -06.

2.2.3 *Ship Data*
Continuously logging of the following six second averaged data, throughout the cruise provided to the FRR laptop computer from *KA'IMIMOANA*'s Scientific Computer System (SCS):

(a) GPS time
(b) GPS latitude
(c) GPS longitude
(d) Seawater temperature
(e) Seawater salinity
(f) Solar irradiance

The solar irradiance is extremely useful for merging the data from NASA's FRR instruments with *KA'IMIMOANA*'s SCS data.

Principal investigators:
Dr Michael J. Behrenfeld, NASA 301-286-2742 mjb@neptune.gsfc.nasa.gov

3.0 *Hazardous Materials*

The Chief Scientist is responsible for the proper and safe storage of scientific hazardous material and complying with NC Instruction 6280B, Hazardous Materials and Hazardous Waste Policy, Guidance, and Training, dated May 8, 1991. This includes the requirement for the Chief Scientist to remove all scientific team hazardous materials and waste at the end of the cruise.

3.1 *Ancillary Projects Hazardous Materials*

1. Acetone	12 Liters	MBARI
2. Hydrochloric Acid (HCL)	5 Liters	MBARI
3. Radioactive Carbon Isotopes - 5mCi (5 milli Curies)	50 mLs	MBARI
4. Soda lime	1 kg	MBARI
5. Liquid Nitrogen	20 Liters	MBARI
6. Formalin (50% stored in Wx deck Hazmat locker) (diluted to 5% working solution for wet lab use)	32 Liters	Bloomsburg University
7. Compressed Nitrogen "T" cylinders (2000 psi each) -passed hydrostatical pressure test within 5 years	2 cyl.	NASA

Appendices
A. Operations Spreadsheet
B. Mooring Equipment Weight List

MOORING EQUIPMENT WEIGHT LIST

NOAA Ship *KA'IMIMOANA*

KA-01-04

San Diego, California to Honolulu, Hawaii
May 10-20, 2001

ATLAS MOORINGS (Unit Weight = 4.6 L.T.): 8

ITEM	NUMBER	WEIGHT PER UNIT (lbs)	TOTAL WEIGHT (lbs)
TOROID	5	700	3,500
TOWER	5	135	675
BRIDLE	5	185	925
FLOATATION INSERTS (Pairs)	3	150	450
NILSPIN -700M (Reels)	10	707	7,070
NYLON (Reels)	18	260	4,680
NYLON MARKED EV50 (Reels)	8	200	1,600
VECTRAN 2000m pieces (Reels)	2	150	300
KEVLAR 1018m (Reels)	1	175	175
EMPTY NYLON/WIRE (Reels)	15	50	750
EMPTY T-CABLE (Reels)	4	75	300
EMPTY KEVLAR (Reels)	1	75	75
GLASS BALL BASKETS (8 balls per basket)	2	500	1000
ADCP FLOAT / CAGE	1	1000	1000
ADCP	1	300	300
ADCP BATTERY CASE	2	65	130
FOOT LOCKER	4	200	800
DATA LOGGER TUBES	16	170	2,720
ACOUSTIC RELEASE	8	100	800
MISC. HARDWARE	2	550	1,100
FITTINGS (Gray boxes)	1	400	400
ANCHOR (ADCP)	2	1,600	3,200
ANCHOR (Taut-NG)	11	4,480	49,280
ANCHOR (Taut-NG w/ Insert)	2	5,980	11,960
AIR "K" CYLINDERS	4	90	360
LEAD WEIGHT	4	110	440
SOLO Drifter ARGO Floats (91"x21"x18")	11	100	1,100
TOTAL			**95,090**

TOTAL WEIGHT: **42.5 L.T.**

SanPedro Channel CTDs

Activity	Latitude	Longitude	Dist (nm)	Speed (kts)	Trans (hrs)	On Sta (hrs)	Arrive Date/time	Depart Date/time
Depart San Diego, CA	32° 43' N	117° 11' W						08-May 10:00
CTD-LA-3 (E)	33° 31.7' N	117° 52.7' W	59.9	10.5	5.7	0.5	08-May 15:42	08-May 16:12
CTD-LA-3 (S)	33° 30.6' N	117° 54.0' W	1.5	10	0.2	0.5	08-May 16:21	08-May 16:51
CTD- 00LA-03A (447 M)	33° 31.7' N	117° 54.0' W	1.1	10	0.1	0.5	08-May 16:58	08-May 17:28
CTD-LA-3 (N)	33° 32.8' N	117° 54.0' W	1.1	10	0.1	0.5	08-May 17:34	08-May 18:04
CTD-LA-3 (W)	33° 31.7' N	117° 55.3' W	1.5	10	0.2	0.5	08-May 18:14	08-May 18:44
CTD-LA-2 (SE)	33° 35.6' N	118° 16.9' W	18.4	10	1.8	0.5	08-May 20:34	08-May 21:04
CTD-LA-2 (NE)	33° 37.1' N	118° 16.5' W	1.6	10	0.2	0.5	08-May 21:13	08-May 21:43
CTD- 00LA-02A (250 M)	33° 36.6' N	118° 17.6' W	1.1	10	0.1	0.5	08-May 21:50	08-May 22:20
CTD-LA-2 (SW)	33° 36.0' N	118° 18.7' W	1.1	10	0.1	0.5	08-May 22:26	08-May 22:56
CTD-LA-2 (NW)	33° 37.6' N	118° 18.3' W	1.6	10	0.2	0.5	08-May 23:06	08-May 23:36
Arrive Honolulu, HI	21° 18' N	157° 53' W	2217.3	10.5	211.2		17-May 18:46	

13 hours of work and transit from San Diego

CRUISE REPORT

Cruise Number: LA01-02
Ship: Seawatch

Area of Operations: San Pedro Channel, California

Itinerary:

Terminal Island, California	June 13, 2001
Terminal Island, California	June 14, 2001

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

William Floering	M	PMEL

Objectives of the Cruise:
1. Recover and re-deploy one mooring at the San Pedro Channel study area LA-3.
2. Recover and re-deploy one mooring at the San Pedro Channel study area LA-2.

Operations:

Moorings Recovered: 2

01LA-3D	33° 31.694'	117° 54.050'	in 445 meters of water
01LA-2D	33° 36.554'	118° 17.596'	in 254 meters of water

Moorings Deployed: 2

01LA-3E	33° 31.693'	117° 54.050'	in 449 meters of water
01LA-2E	33° 36.557'	118° 17.583'	in 250 meters of water

XBT's: 1

Summary of Cruise:
The research vessel Seawatch departed Terminal Island the morning of the 13th. of June for mooring site LA-3. Upon arriving at the mooring site, mooring 00LA-3D consisting of 1-75KHz ADCP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release was recovered. Data was recovered from both the ADCP and RCM-9. The battery was replaced in the ADCP (serial # 1318. RCM-9 (serial # 502) was replaced with RCM-9 serial # 589. Mooring 01LA-3E was then deployed at the same position as the recovered mooring 01LA-3D. One XBT sample was taken.

At mooring site LA-2, mooring 00LA-2D was recovered. The Seawatch returned to Terminal Island with the 00LA-2D instruments. The data recorded from the ADCP and RCM-9 current meter were recovered and the instruments were serviced. On the morning of June 14th, mooring 01LA-2E was deployed at the LA-2 mooring site. The XBT equipment failed to operate properly and an XBT sample could not be taken.

The Seawatch returned to Terminal Island on the after the LA-2 deployment.

Ship Operations:
The Seawatch is operated by the Southern California Marine Institute at Terminal Island, California.

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Principal Investigator:
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DEPLOYMENT

Mooring I.D.:	01LA-2D	Deployment date (L):	1/18/01
Cruise No:	LA01-1	Actual deployment depth (m):	254
Project:	LA	Estimated deployment depth (m):	254
Ship:	Seawatch	Time of release:	018 - 1716
Chief Sci:	Parker	Time on bottom:	
Timekeeper:		Position	
		GPS latitude:	33° 36.554' N
CTD cast no.:		GPS longitude:	118° 17.596' W
Bottom temp:		Magnetic variation:	

		Deployment		Depth (m)		Recovery	
Instrument	Serial Number	JD	Time	Actual	Estimated	JD	Time
RDI 75 KHz ADCP	1296	018	17:12				
RCM9	518	018	17:14				

RECOVERY

Cruise number:	
Time released fm anchor:	
Recovery time at surface:	
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:			
Size:	30"		30"
S/N:	-		-
Color:	yell		yell
Depth (m):			

RELEASE

	PRIMARY		SECONDARY		
Type:	8242				
Serial Number:	016565				
Interrogate freq.:	CH A	CH B			
Reply freq.:	CH A	CH B			
Enable code/rate:					
Disable code/rate:					
Release code/rate:					
Depth (m):					

Comments:

DEPLOYMENT

Mooring I.D.:	01LA-3D	Deployment date (L):	1/17/01
Cruise No:	LA01-1	Actual deployment depth (m):	445
Project:	San Pedro	Estimated deployment depth (m):	445
Ship:	Seawatch	Time of release:	017 - 1940
Chief Sci:	Parker	Time on bottom:	
Timekeeper:		Position	
		GPS latitude:	33° 31.694' N
CTD cast no.:		GPS longitude:	117° 54.050' W
Bottom temp:		Magnetic variation:	

		Deployment		Depth (m)		Recovery	
Instrument	Serial Number	JD	Time	Actual	Estimated	JD	Time
RDI 75 KHz ADCP	1318	017	19:34	433	433		
RCM9	502	017	19:36	439	439		

RECOVERY

Cruise number:	
Time released fm anchor:	
Recovery time at surface:	
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	FT		glass
Size:	30"		
S/N:	none		none
Color:	orange		yell
Depth (m):	433		436

RELEASE

	PRIMARY		SECONDARY		
Type:	8242				
Serial Number:	020991				
Interrogate freq.:	CH A	CH B			
Reply freq.:	CH A	CH B			
Enable code/rate:					
Disable code/rate:					
Release code/rate:					
Depth (m):					

Comments:

CRUISE REPORT

Cruise Number: LA01-03
Ship: *YELLOWFIN*

Area of Operations: San Pedro Channel, California

Itinerary:

	Terminal Island, California	November 28, 2001
	Terminal Island, California	November 28, 2001

Participating Organizations:
NOAA - Pacific Marine Environmental Laboratory (PMEL)
U.S. Army Corps of Engineers (Los Angeles)

Chief Scientist:

William Parker	M	PMEL

Participating Scientists:

William Floering	M	PMEL

Objectives of the Cruise:
1. Recover one mooring at the San Pedro Channel study area LA-3.
2. Recover one mooring at the San Pedro Channel study area LA-2.

Operations:

Moorings Recovered: 2

01LA-3E	33° 31.693'N	117° 54.050'W	in 449 meters of water
01LA-2E	33° 36.557'N	118° 17.583'W	in 250 meters of water

Moorings Deployed: 0

CTDs 6

01LA-3E site:

33° 31.074'N	117° 49.194'W	in 374 meters of water
33° 31.697'N	117° 53.927'W	in 444 meters of water
33° 31.320'N	117° 58.921'W	in 399 meters of water

01LA-2E site:

33° 33.679'N	118° 14.879'W	in 247 meters of water
33° 36.526'N	118° 17.413'W	in 239 meters of water
33° 40.346'N	118° 18.949'W	in 245 meters of water

All CTDs on 01LA-3 Cruise were recorded on a PMEL SBE-19 Seacat.

Summary of Cruise:
The research vessel *YELLOWFIN* departed Terminal Island the morning of November 28th for mooring site LA-3. CTDs were completed approximately 4 nmi south of the mooring site, on site, and 4 nmi north of the mooring site. Mooring 01LA-3E consisting of 1-75KHz ADCP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release was recovered. Full data records were recovered from both the ADCP and RCM-9.

CTDs were completed at site 2 as at site 3. At mooring site LA-2, mooring 01LA-2E was recovered, which consisted of 1-75Khz ADP, 1-RCM-9 Current Meter and 1-8242 Acoustic Release. Full data records were recovered from both the ADCP and RCM-9. R/V *YELLOWFIN* returned to Terminal Island with all mooring instruments.

Ship Operations:
R/V YELLOWFIN is operated by the Southern California Marine Institute at Terminal Island, California.

Contacts:

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Principal Investigator:
Dr. Phyllis Stabeno
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US Army Corps of Engineers
Chuck Mesa
Attn: CESPL-ED-DC
911 Wilshire Blvd.
Los Angeles, Ca 90017
213-452-3678

DEPLOYMENT

Mooring I.D.:	01LA-2E	Deployment date (L):	6/14/01
Cruise No:	01SW-2	Actual deployment depth (m):	250
Project:	San Pedro	Estimated deployment depth (m):	254.0
Ship:	Seawatch	Time of release:	165 - 1553
Chief Sci:	Parker	Time on bottom:	
Timekeeper:		Position	
		GPS latitude:	33° 36.557' N
CTD cast no.:		GPS longitude:	118° 17.583' W
Bottom temp:		Magnetic variation:	

		Deployment		Depth (m)		Recovery	
Instrument	Serial Number	JD	Time	Actual	Estimated	JD	Time
RDI 75 KHz ADCP	1296	165	15:50	240		332	23:44
RCM9	518	165	15:50	245		332	23:45

RECOVERY

Cruise number:	LA01-03
Time released fm anchor:	332 - 2330
Recovery time at surface:	332 - 2333
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:			
Size:	30"		30"
S/N:	-		-
Color:	yell		yell
Depth (m):			

RELEASE

	PRIMARY	SECONDARY
Type:	8242	
Serial Number:	016565	
Interrogate freq.:		
Reply freq.:		
Enable code/rate:		
Disable code/rate:		
Release code/rate:		
Depth (m):		

Comments:

DEPLOYMENT

Mooring I.D.:	01LA-3E	Deployment date (L):	6/13/01
Cruise No:	01SW-2	Actual deployment depth (m):	449
Project:	San Pedro	Estimated deployment depth (m):	445
Ship:	Seawatch	Time of release:	164 - 1918
Chief Sci:	Parker	Time on bottom:	
Timekeeper:		Position	
		GPS latitude:	33° 31.693' N
CTD cast no.:		GPS longitude:	117° 54.050' W
Bottom temp:		Magnetic variation:	

		Deployment		Depth (m)		Recovery	
Instrument	Serial Number	JD	Time	Actual	Estimated	JD	Time
RDI 75 KHz ADCP	1318	164	19:15	437		332	19:50
RCM9	589	164	19:15	443		332	19:52

RECOVERY

Cruise number:	LA01-03
Time released fm anchor:	332 - 1934
Recovery time at surface:	332 - 1938
CTD cast number:	

FLOATS

	Top	Mid	Bottom
Type:	SF		glass
Size:	30"		
S/N:			6 ea
Color:	orange		yell
Depth (m):			

RELEASE

	PRIMARY		SECONDARY		
Type:	8242				
Serial Number:	020991				
Interrogate freq.:	CH A	CH B			
Reply freq.:	CH A	CH B			
Enable code/rate:					
Disable code/rate:					
Release code/rate:					
Depth (m):					

Comments: