

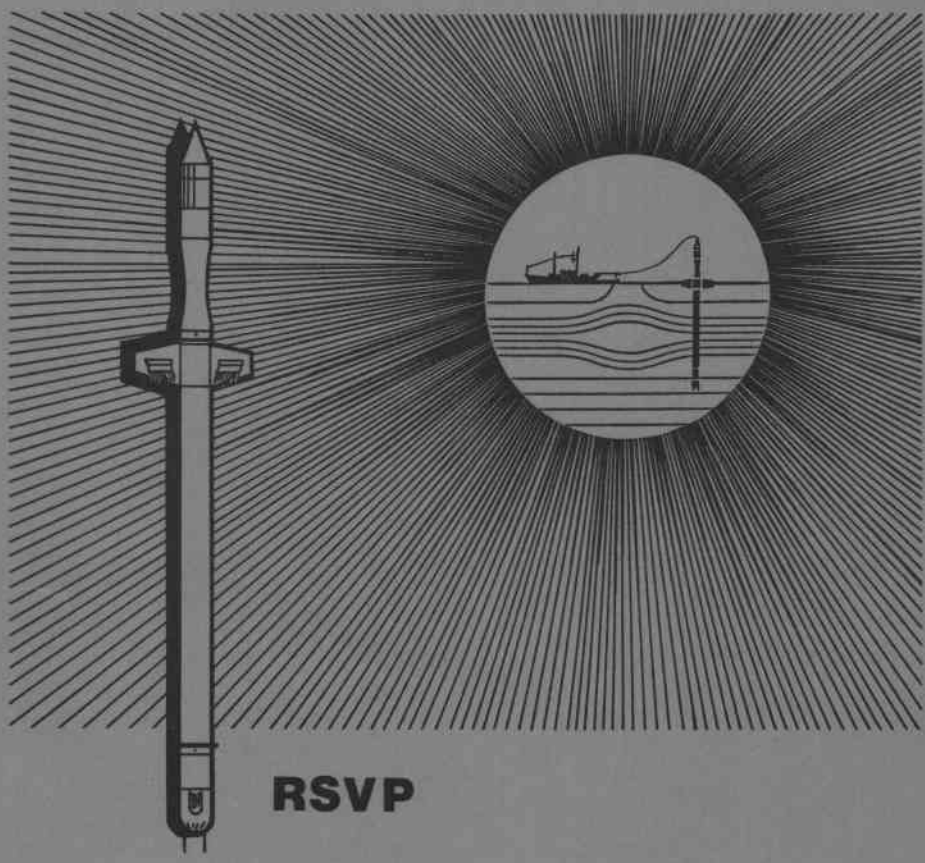
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RSVP

**Tropic heat 1984
Rapid Sampling Vertical Profiler
Observations**

by
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DATA REPORT 119

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OREGON STATE UNIVERSITY

TROPIC HEAT 1984
RAPID SAMPLING VERTICAL PROFILER
OBSERVATIONS

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Acknowledgements

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TROPIC HEAT DATA REPORT

In November and December of 1984, we participated in the TROPIC HEAT program during the period of an intensive moored array (Eriksen, 1985 discusses the goals and execution of the program). Vertical profiles of temperature, electrical conductivity and micro-scale shear were made using the Rapid Sampling Vertical Profiler (RSVP) deployed from the R/V Wecoma. Two major sets of data were obtained with the RSVP, first a transect from 3°N to 3°S and second a 12 1/2-day station at the equator. Profiling began at 3°N, 140°15'W as the ship steamed southward at 4.5 knots towing a chain of thermistors and conductivity sensors (C. Paulson, OSU). Simultaneously, continuous velocity profiles were made with an acoustic doppler current profiler (L. Regier, SIO). 670 RSVP profiles were obtained enroute to 3°S, 140°15'W at which point the chain was brought aboard and we proceeded to position ourselves near to the surface meteorological buoy (D. Halpern's T-44 buoy) located at 0°02.14'S, 140°09.20'W. From November 19, 1984 to December 1, 1984 we profiled continuously while maintaining position within a 1.5 x 1.5 nm box centered 1.75 nm north of the T-44 buoy, obtaining 1749 good RSVP profiles.

INSTRUMENTATION

The RSVP contains a suite of instrumentation designed to rapidly and continuously sample in the upper 200 meters of the ocean; temperature (Thermometrics FPl4 sensor), conductivity (Neil Brown Instrument Systems sensor or Precision Measurement Engineering sensor) from which salinity and hence sigma-theta are computed and micro-scale shear (using airfoil or shear probes from Undersea Technology) from which the turbulent kinetic energy dissipation rate is computed. The instrument, as it was used during TROPIC HEAT, is documented by Caldwell

et. al. (1985) while earlier versions are described by Newberger et al (1982, 1984). The method of deploying the instrument is essentially as described in these reports. There were actually seven distinct but interchangeable units aboard the R/V Wecoma for TROPIC HEAT. Two were scavenged for spare parts as the cruise progressed and we encountered technical problems (notably, salt contamination through the thermistor/shear probe plug-in connectors).

(An RSVP was mounted on the thermistor chain at 120 m depth during the transect from 3°N to 3°S in an attempt to obtain a horizontal profile of microscale conductivity and shear. The PME conductivity probe appeared to work well but due to an unfortunate operator error the signal was low pass filtered well below the data band. The shear probe signals were noisy due to chain vibration but appear to have measured the largest signal levels. No data from this unit is presented in this report).

DATA REDUCTION

Pressure, temperature and conductivity raw data were extracted from tape and averaged over 20 cm (~50 points). Surface pressure was adjusted by determining the depth at which the conductivity signal went on scale (the conductivity signal is off scale in air). Temperature and conductivity calibrations were compared to CTD casts sampled periodically throughout the cruise (Chereskin et. al., 1984) and a continuously sampling Seabird system. Calibration adjustments for surface values were made from the Seabird system which was continually sampled at 2 minute intervals. We note here that the Seabird temperatures were consistently higher (by 0.05 to 0.25°C) than the CTD surface temperatures. Deep points for calibration adjustment were obtained from CTD profiles.

During the transect, severe conductivity drift in the instrument due to contamination caused a calibration adjustment problem with tape 61 drops 6-19. The salinity, sigma-theta, Brunt-Vaisala frequency and stability ratio are not accurate during these casts. Severe sensor drift during the station was not apparent and minor adjustments were possible with the daily CTD cast when necessary.

After the temperature and conductivity were adjusted, salinity and sigma-theta were computed over each 20 cm depth range using Unesco 1978 algorithms. Brunt-Vaisala frequency (buoyancy frequency) was computed for two meter segments. The stability ratio (Turner, 1973), defined by,

$$R_{\rho} = \alpha\Delta T / \beta\Delta S$$

was also computed over two meter intervals (α , β are the expansion coefficients for temperature and salinity, respectively).

The signal from two orthogonally mounted airfoil probes were sampled at 360 Hz or 180 Hz. Blocks of 512 or 256 points were calibrated using measured and computed calibrations (see Osborn and Crawford, 1980 for a discussion of the probe response) and then Fourier-transformed. A measured transfer function (Ninnis, 1984) was applied to the data before integrating to obtain shear variance. The lower integration limit was set at 2 Hz to avoid contamination by low frequency instrument wobble. The upper limit was variable and adjusted to track the viscous cutoff wave number as well as possible without including high frequency noise contamination (from either electronic or vibrational sources). The dissipation was then computed using

$$\epsilon = 7.5 \nu(T) \{ \langle \partial u / \partial z \rangle^2 + \langle \partial v / \partial z \rangle^2 \}$$

where $\nu(T)$ is a temperature dependent viscosity, $\langle \partial u / \partial z \rangle^2$ and $\langle \partial v / \partial z \rangle^2$ are the shear variances for each of the two probes.

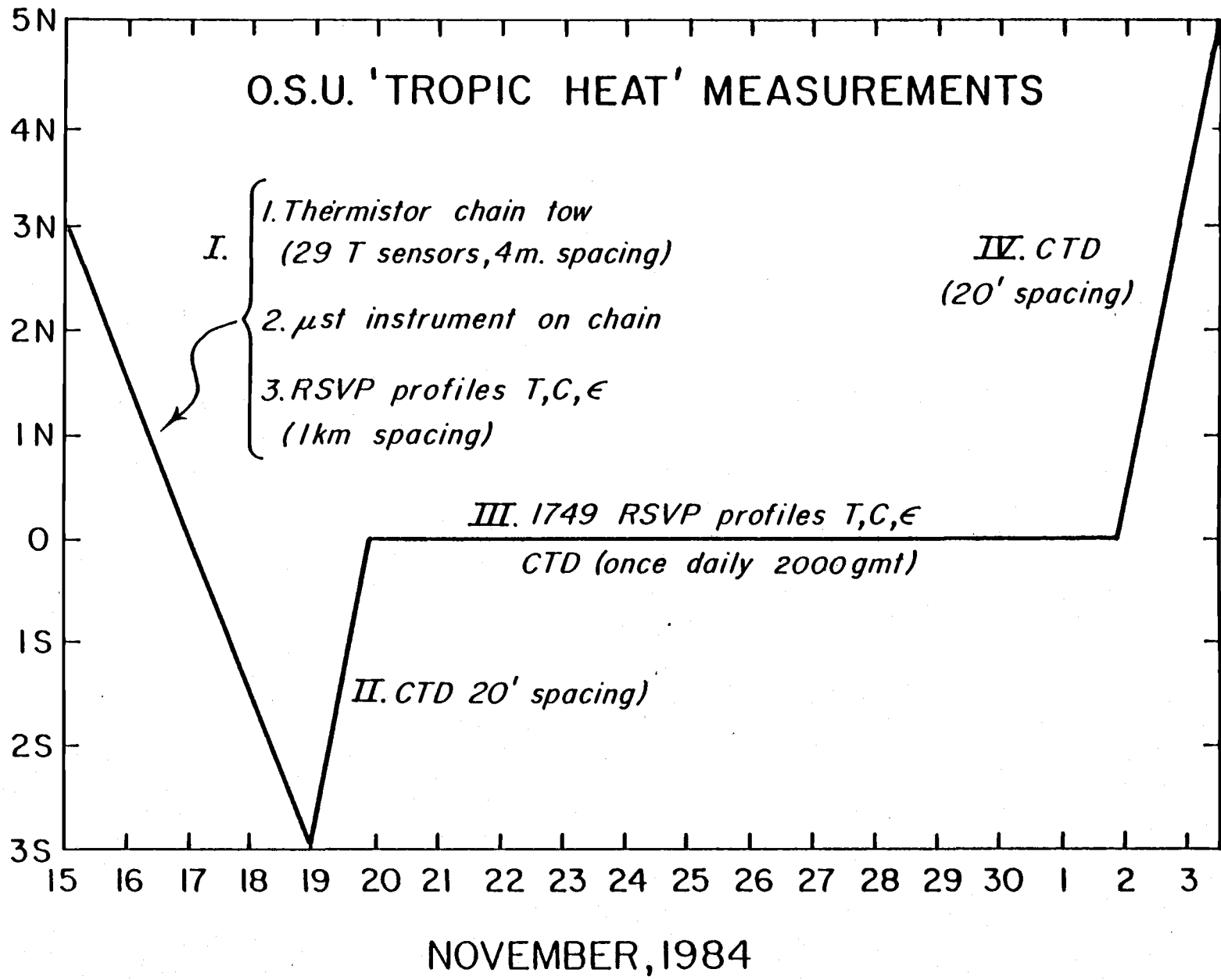
THE PLOTS

Only one plot is presented for each hour of data sampling; to present them all would make this report far too long. There are two major sections corresponding to the transect and the station time series. Plots for each hour were selected for presentation here. During the transect, missing data resulted from instrumentation problems. This occurred primarily at the beginning of the transect. Gaps in the station data indicate either a pause for a CTD cast (usually one hour), use of a special RSVP unit equipped with a PME microconductivity sensor (data not yet available), or an equipment malfunction.

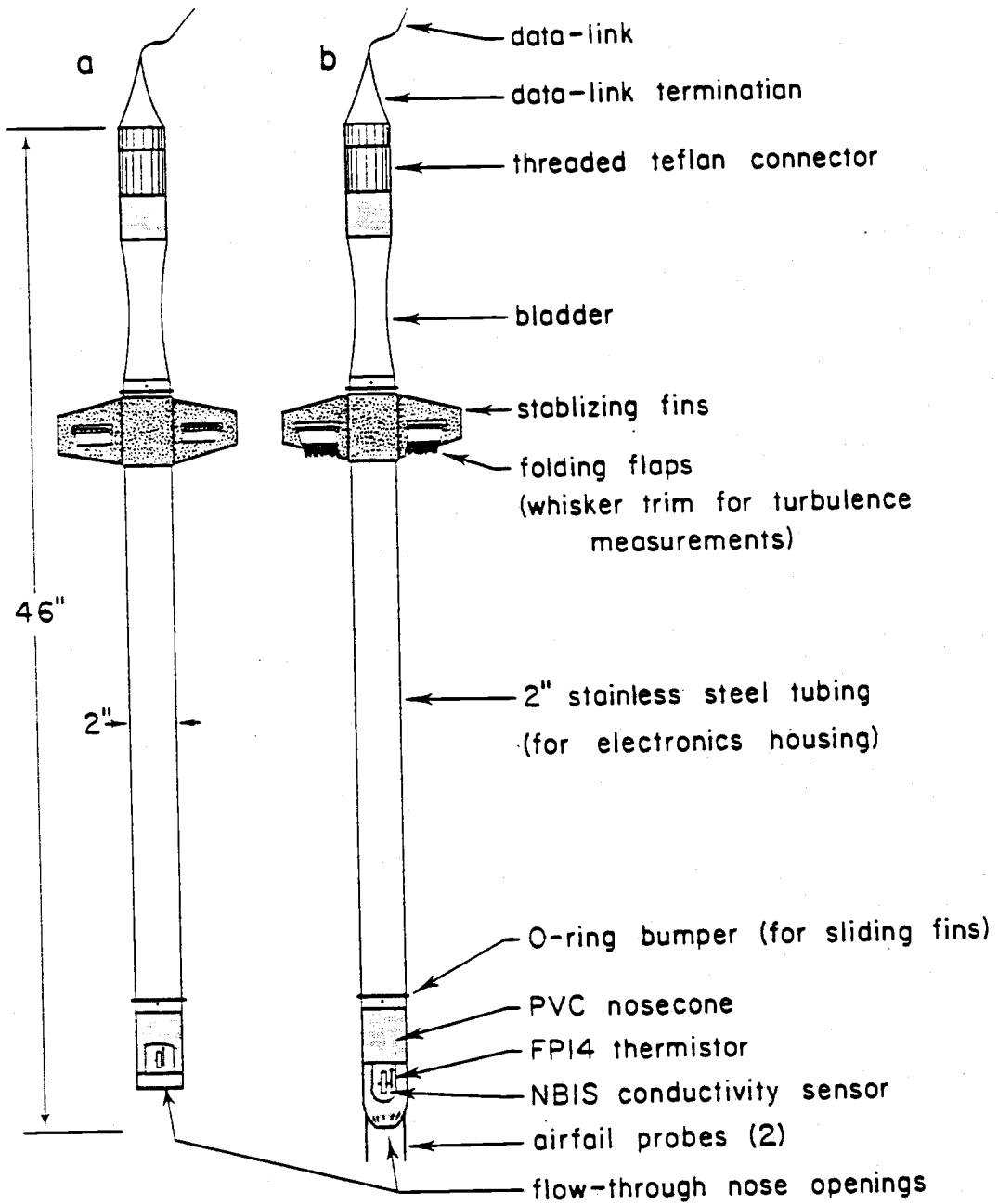
The main data report plot has five boxes, the GMT date and time, and the tape and drop number. The first box on the left shows 20 cm averages of temperature (small dashes), salinity (solid line), sigma-theta (large dashes), and two meter averaged Brunt-Vaisala frequency (diamonds) versus depth. The second plot is the arc tangent of the stability ratio averaged over two meters versus depth. Values between $[-\pi/4, 0]$ are regions where double diffusion can occur. Values between $[0, \pi/2]$ are stable, and $[\pi/2, 3\pi/4]$ are regions where salt fingering may occur. The third box is the uncalibrated temperature derivative, and the fourth and fifth boxes are the uncalibrated but scaled (with respect to a common sensitivity) shear signals. The temperature derivative and shear signals were decimated every 5 points (~ 2 cm) for the purpose of plotting.

In addition, each major section is preceded by selected summary plots and tables. The transect includes a dissipation and wind speed versus latitude plot which is discussed in detail elsewhere (Moum et. al., 1985). A table referencing tape and drop numbers to latitude, an air and sea surface temperature plot, waterfall plots of sigma-theta, contour plots

of temperature, salinity and sigma-theta, and 5'-averaged T-S diagrams shown every 20' are also included. Additional plots for the station begin with a figure from Moum and Caldwell (1985) of dissipation and wind speed versus time during the station. Air and sea surface temperature, waterfall plots, contour plots and T-S diagrams every six hours for the station are also included.

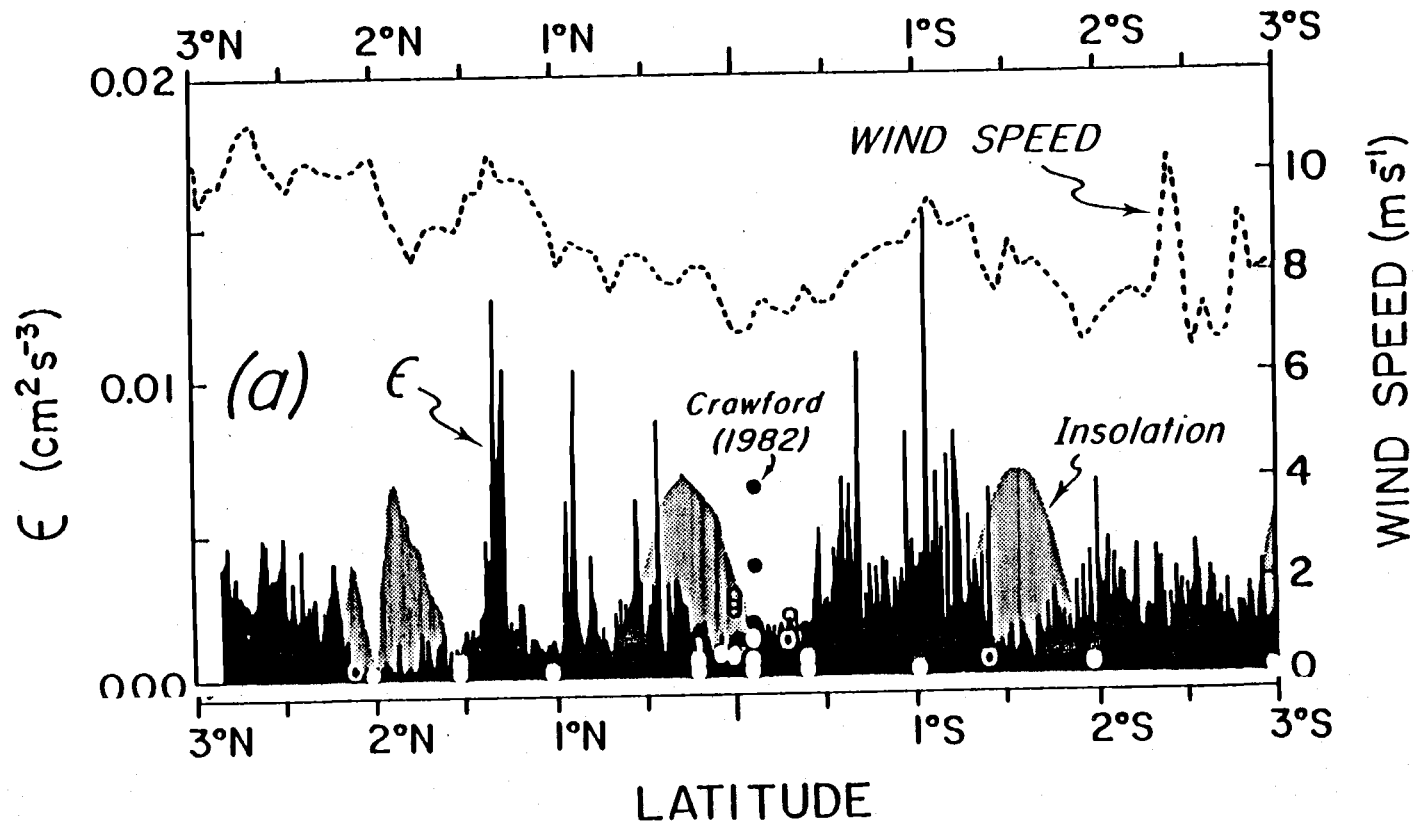


RSVP CAST SUMMARY						
DATE LOCAL	NUMBER OF CASTS					TOTAL
	UNIT #4	UNIT #5	UNIT #6	UNIT #15	UNIT #16	
11/15/84	99	-	-	12	-	111
11/16/84	195	-	-	-	-	195
11/17/84	52	-	-	-	145	197
11/18/84	-	-	-	-	152	152
11/19/84	6	-	-	-	5	11
11/20/84	-	89	21	-	-	110
11/21/84	-	84	23	-	-	107
11/22/84	-	113	2	-	-	115
11/23/84	3	95	10	-	-	108
11/24/84	-	64	10	15	5	94
11/25/84	-	150	23	-	1	174
11/26/84	-	200	-	-	-	200
11/27/84	-	105	-	-	83	188
11/28/84	-	-	-	-	214	214
11/29/84	-	1	-	-	191	192
11/30/84	-	166	-	-	-	166
12/1/84	-	129	-	-	-	129
TOTALS	355	1196	89	27	796	2463



a) Standard RSVP

b) Turbulence RSVP



POSITION LOG - TRANSECT

DATE	TAPE	DROP	LATITUDE DEGREES
11/15	14	2	+2.85 N
11/15	14	10	+2.78 N
11/15	14	16	+2.65 N
11/15	14	20	+2.60 N
11/15	14	24	+2.51 N
11/15	23	2	+2.46 N
11/15	23	11	+2.40 N
11/15	28	11	+1.93 N
11/15	28	19	+1.88 N
11/15	28	24	+1.84 N
11/16	31	6	+1.77 N
11/16	31	13	+1.69 N
11/16	31	20	+1.61 N
11/16	33	1	+1.53 N
11/16	33	9	+1.46 N
11/16	33	16	+1.40 N
11/16	33	24	+1.35 N
11/16	35	5	+1.28 N
11/16	35	14	+1.22 N
11/16	35	23	+1.14 N
11/16	38	4	+1.08 N
11/16	38	13	+1.02 N
11/16	38	20	+0.97 N
11/16	38	26	+0.89 N
11/16	40	6	+0.82 N
11/16	40	15	+0.75 N
11/16	40	23	+0.67 N
11/16	42	3	+0.58 N
11/16	42	12	+0.49 N
11/16	42	21	+0.45 N

Position Log - Transect (cont'd.)

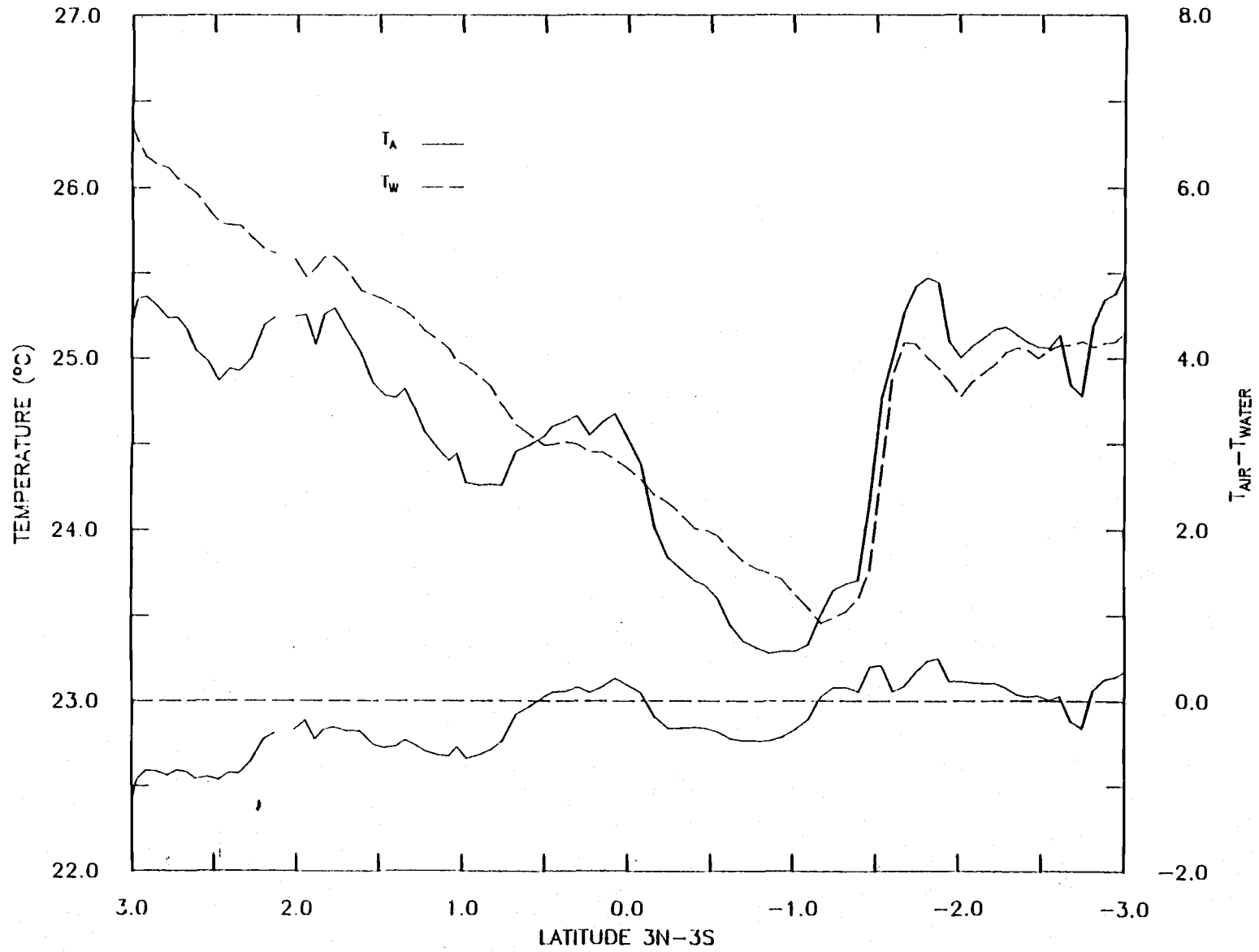
DATE	TAPE	DROP	LATITUDE DEGREES
11/16	44	1	+0.38 N
11/16	44	11	+0.30 N
11/16	44	19	+0.23 N
11/16	44	28	+0.15 N
11/17	46	7	+0.07 N
11/17	46	16	-0.01 S
11/17	46	25	-0.09 S
11/17	49	5	-0.17 S
11/17	49	14	-0.25 S
11/17	49	23	-0.34 S
11/17	53	4	-0.42 S
11/17	53	11	-0.48 S
11/17	53	20	-0.55 S
11/17	55	1	-0.64 S
11/17	55	8	-0.70 S
11/17	55	16	-0.78 S
11/17	55	25	-0.86 S
11/17	57	4	-0.94 S
11/17	57	13	-1.02 S
11/17	57	21	-1.10 S
11/17	59	2	-1.17 S
11/17	59	8	-1.25 S
11/17	59	17	-1.33 S
11/17	59	26	-1.40 S
11/17	61	7	-1.48 S
11/17	61	16	-1.55 S
11/17	61	24	-1.61 S
11/17	63	4	-1.68 S
11/17	63	11	-1.74 S

Position Log - Transect (cont'd.)

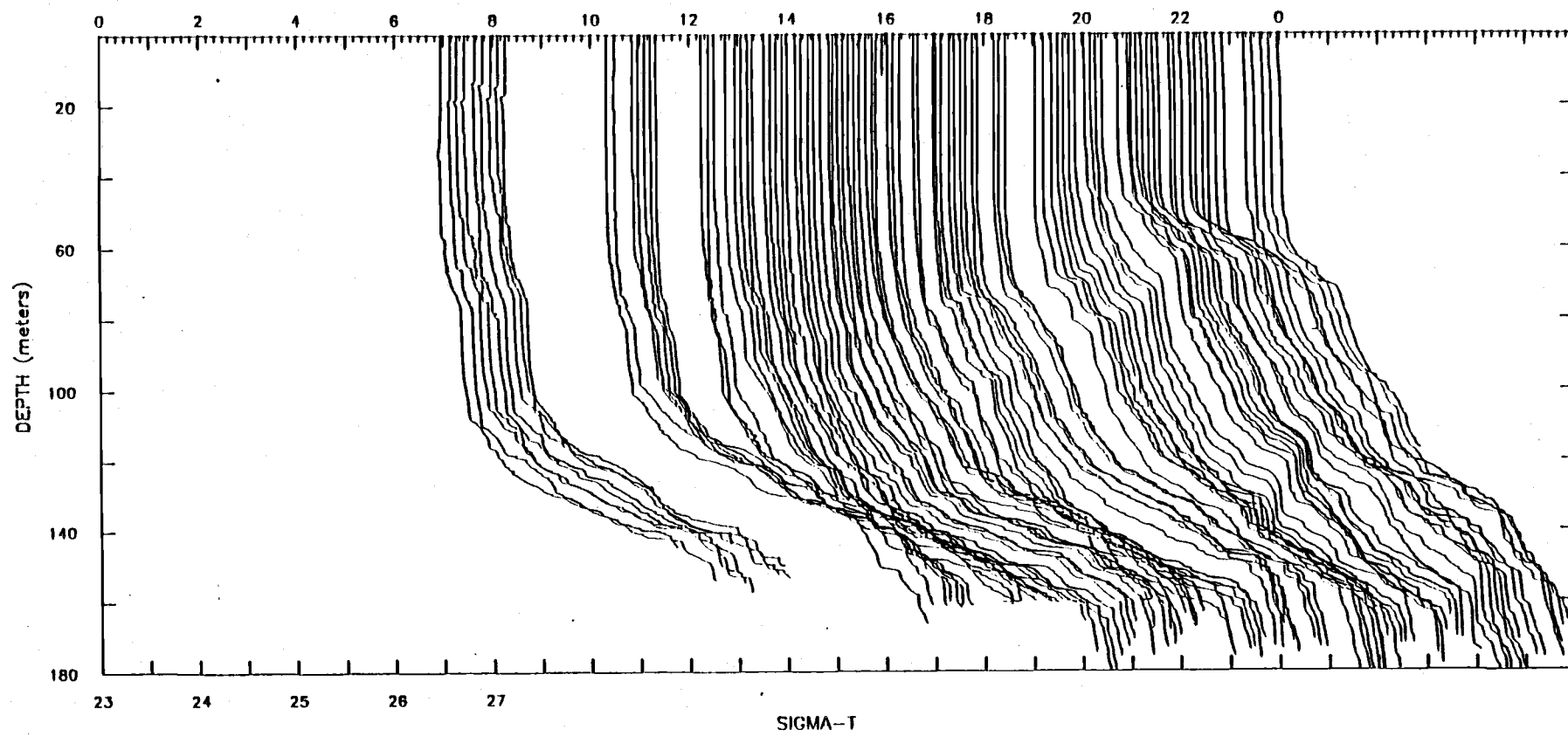
DATE	TAPE	DROP	LATITUDE DEGREES
11/18	63	18	-1.81 S
11/18	65	1	-1.89 S
11/18	65	9	-1.95 S
11/18	65	17	-2.02 S
11/18	66	1	-2.09 S
11/18	66	9	-2.16 S
11/18	66	17	-2.22 S
11/18	68	7	-2.36 S
11/18	68	15	-2.42 S
11/18	68	23	-2.49 S
11/18	71	1	-2.55 S
11/18	71	18	-2.69 S
11/18	71	27	-2.76 S
11/18	72	7	-2.82 S
11/18	72	16	-2.89 S
11/18	72	24	-2.94 S
11/18	73	1	-2.99 S

END OF TRANSECT

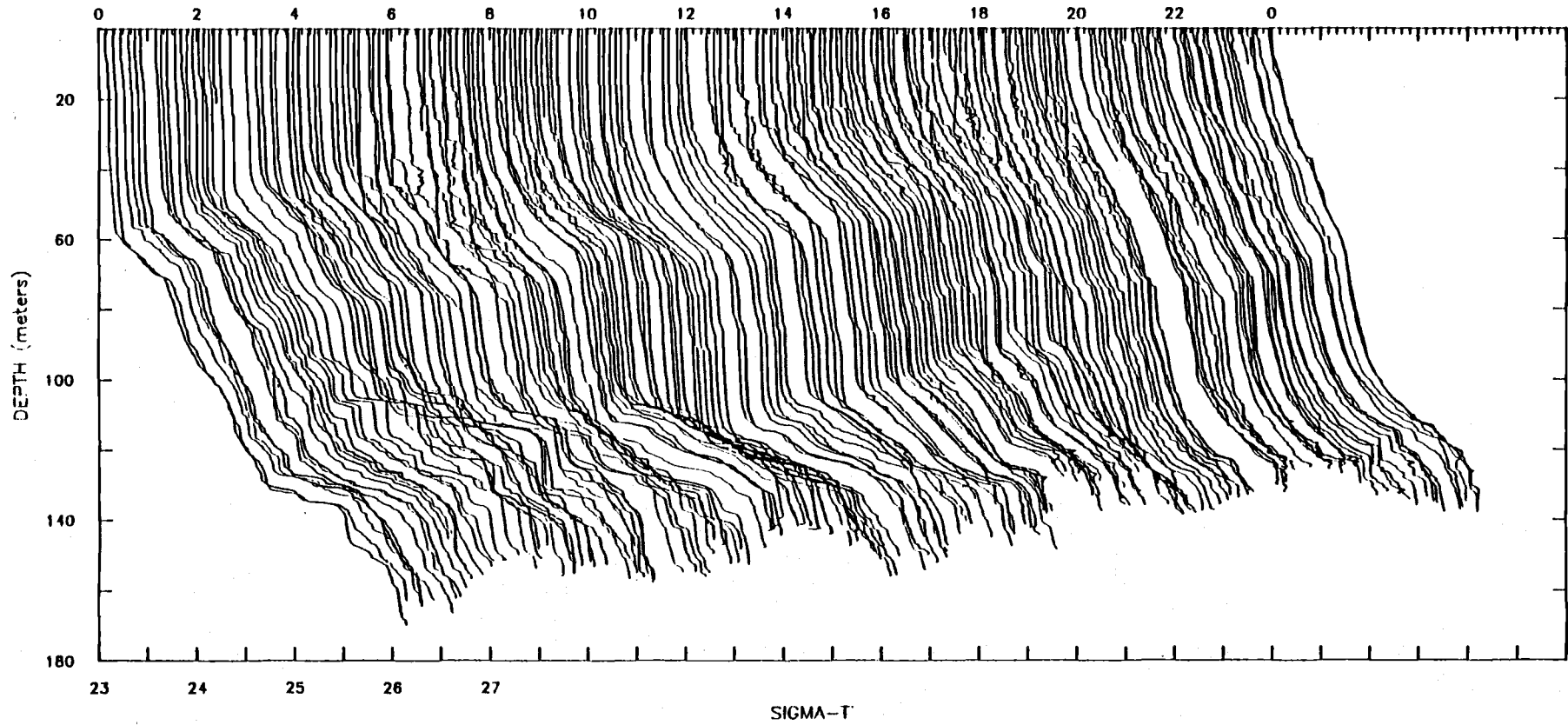
TROPIC HEAT AIR-WATER TEMPERATURE 1984



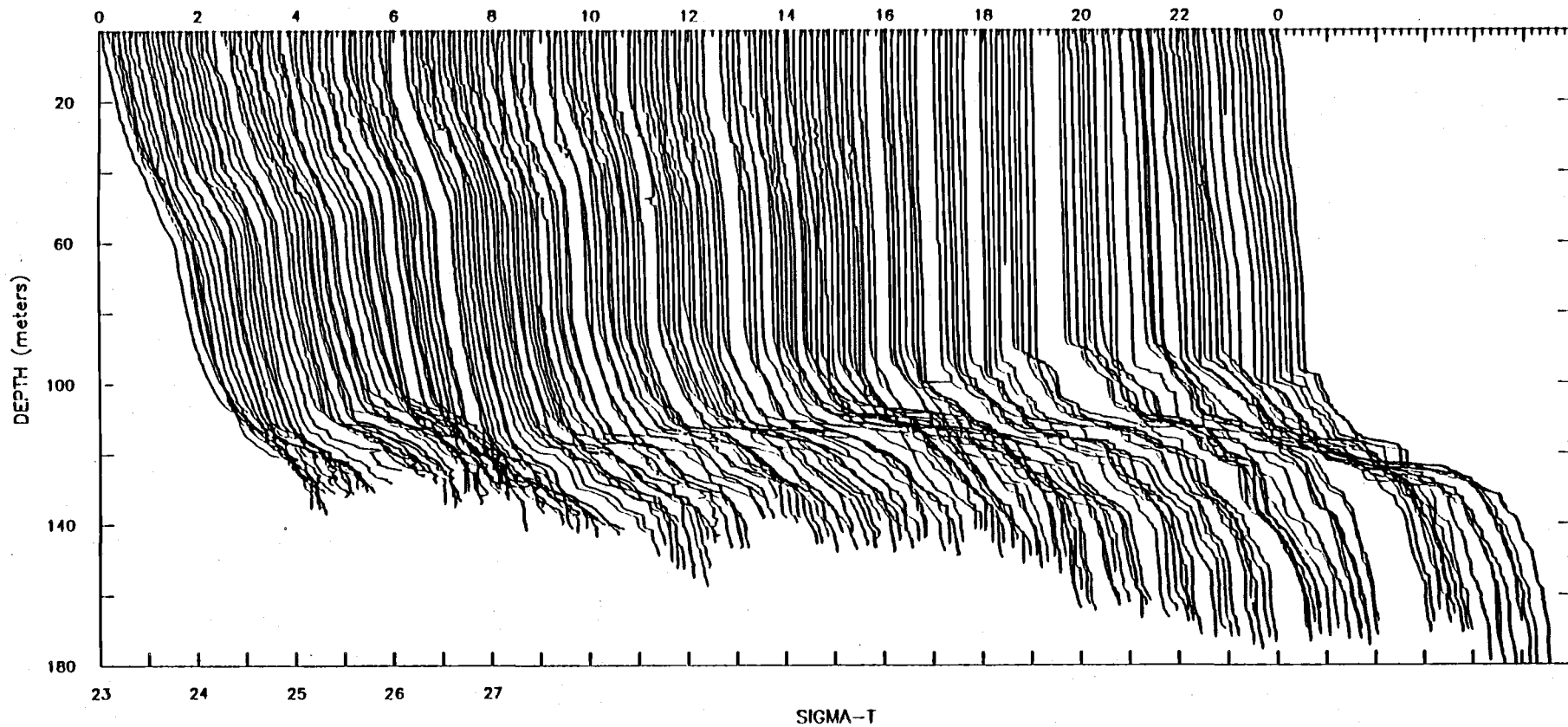
November 15, 1984



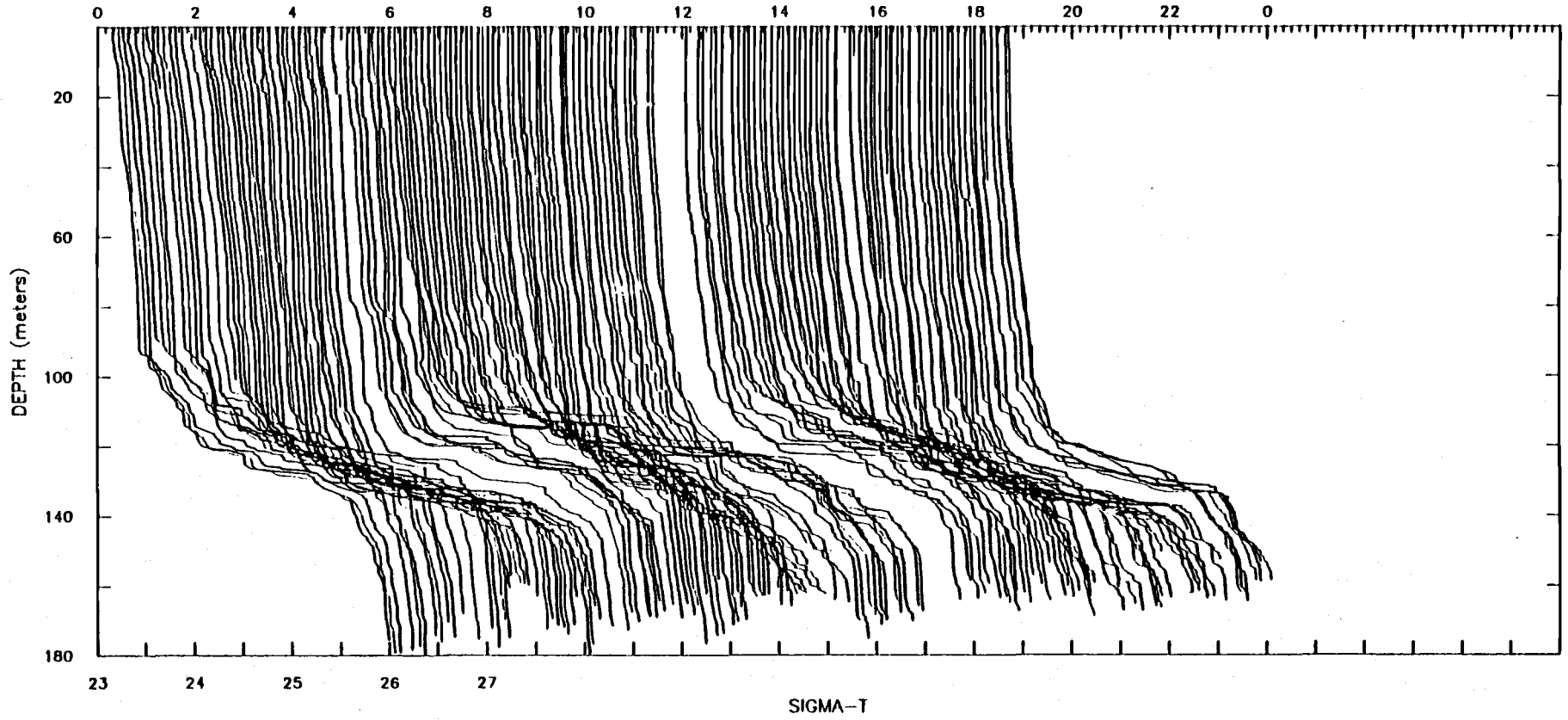
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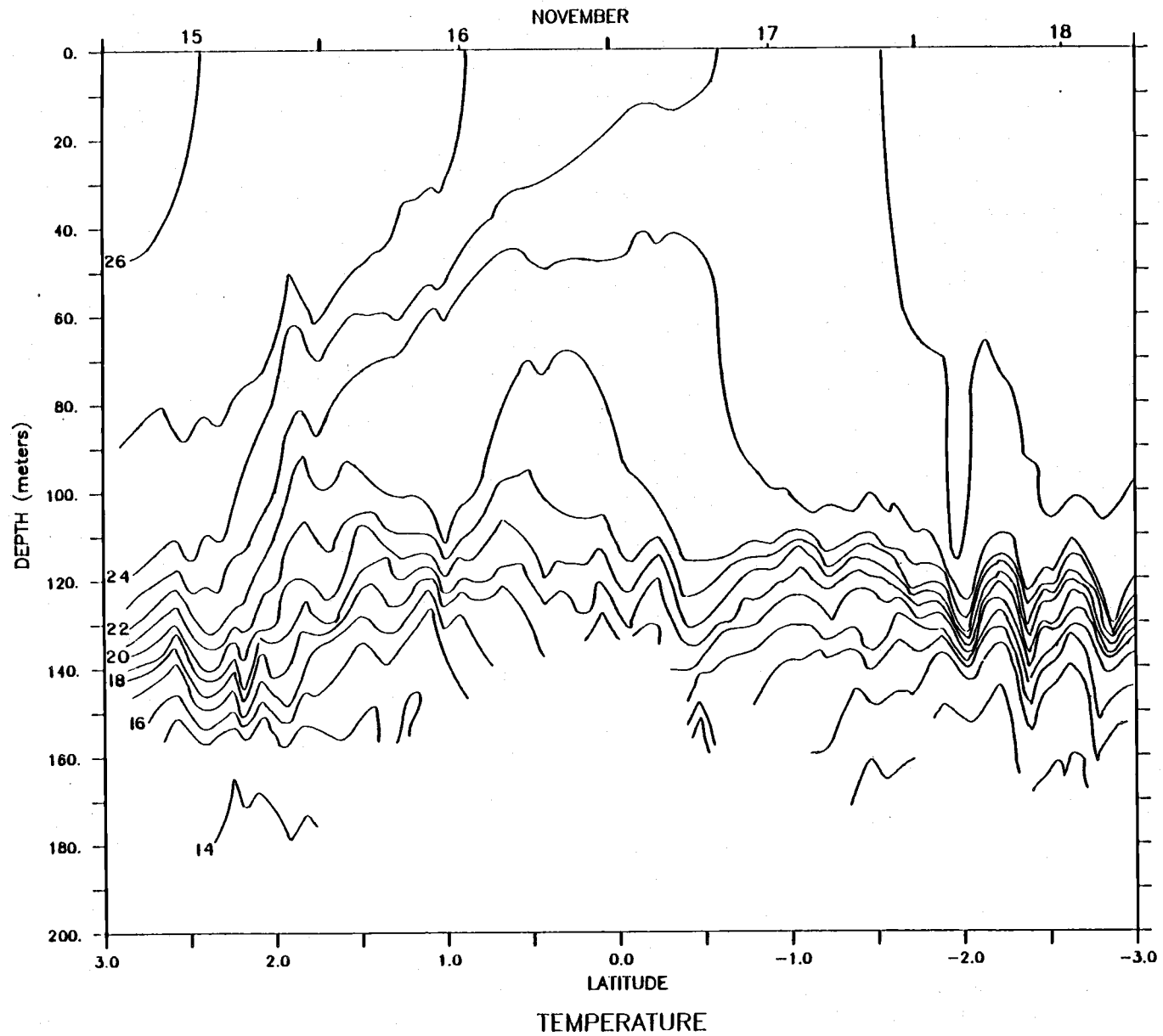


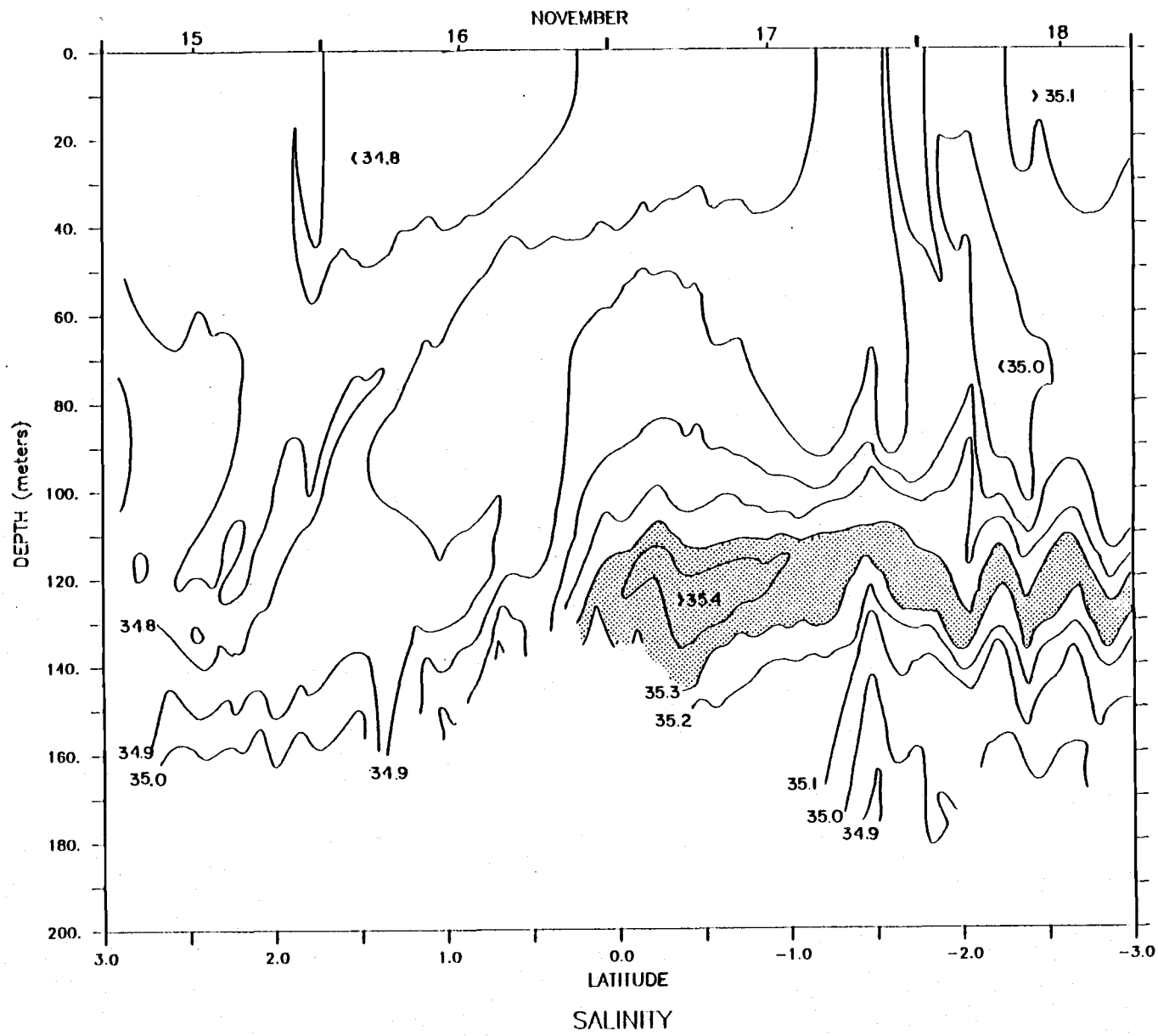
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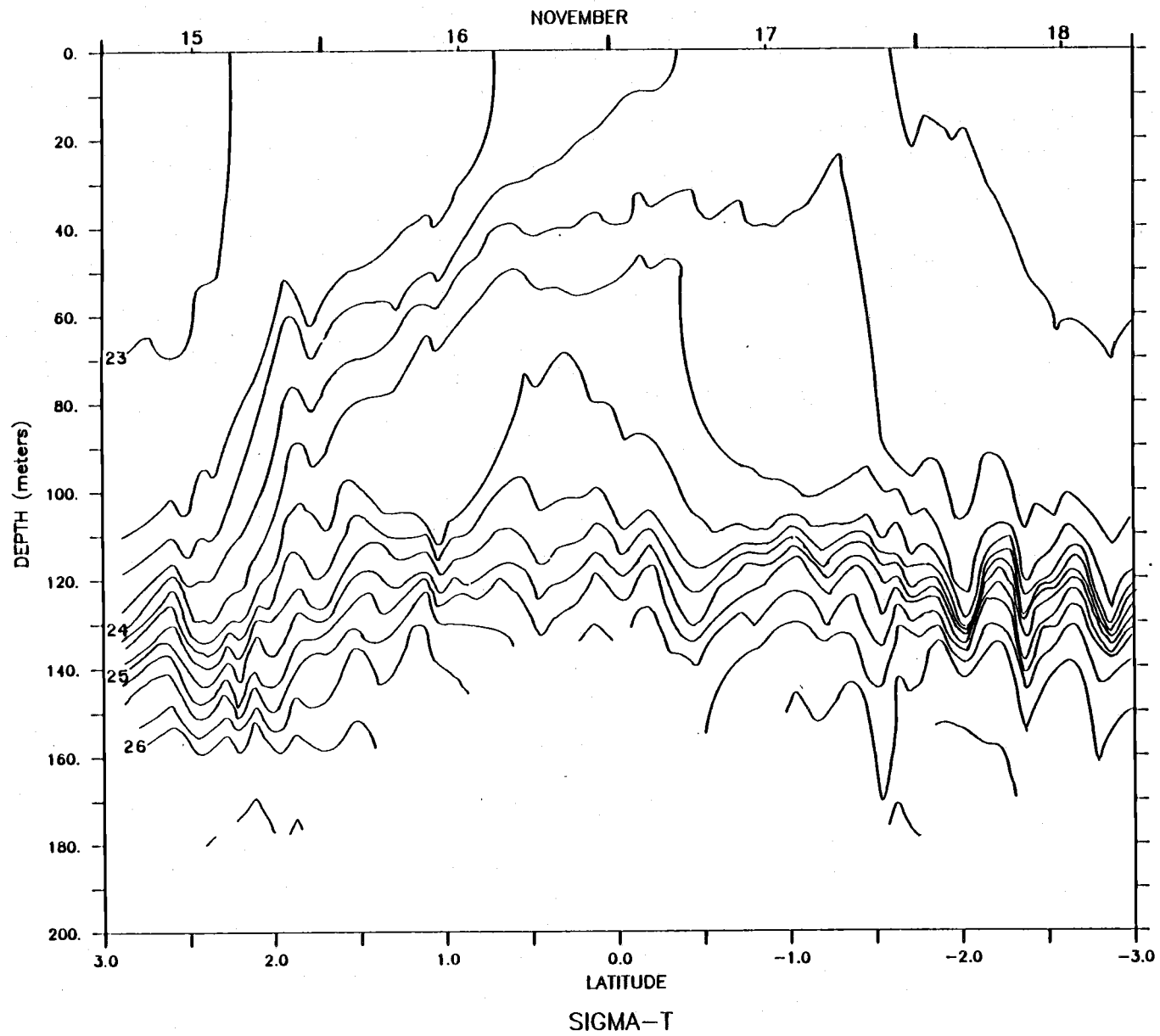


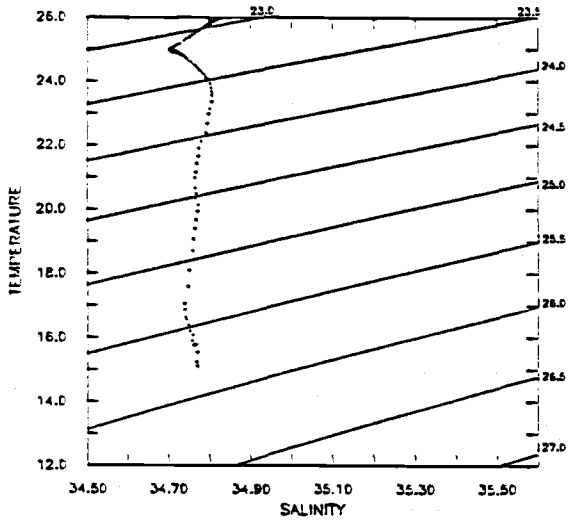
NOVEMBER 18, 1984



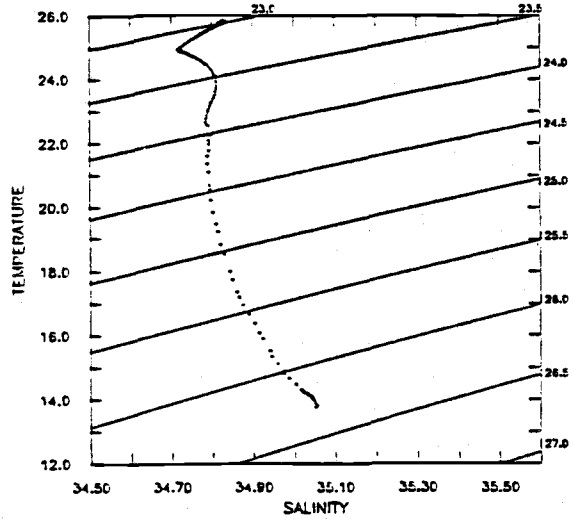




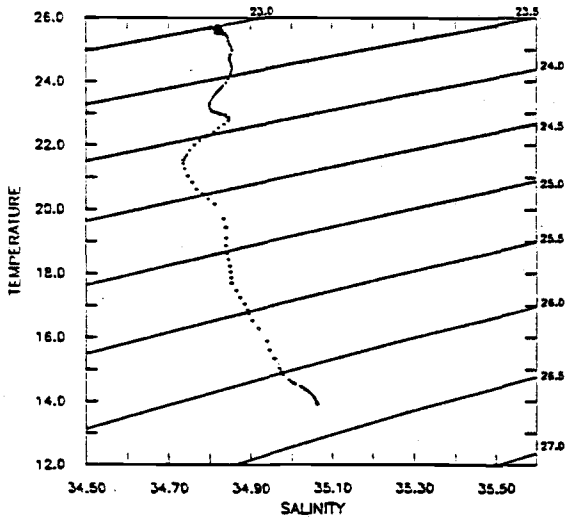




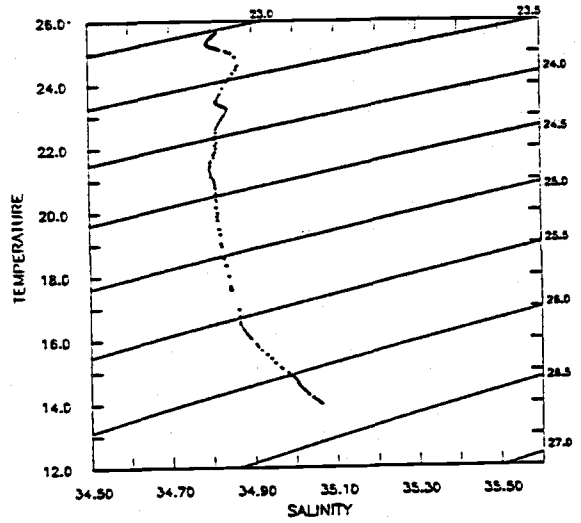
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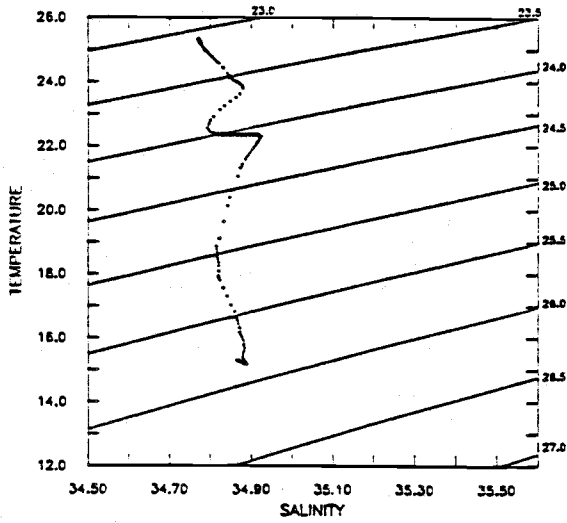
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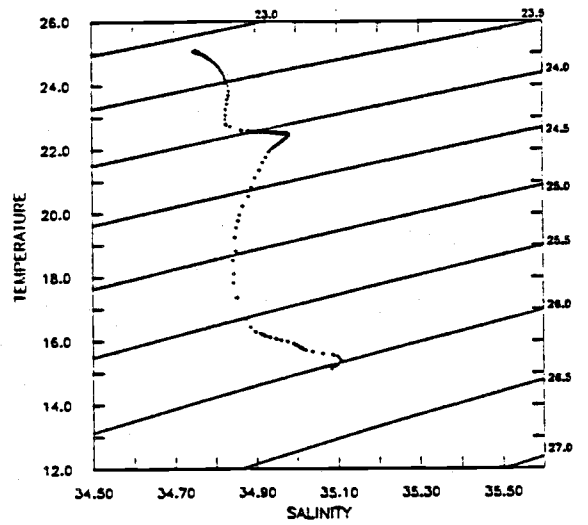
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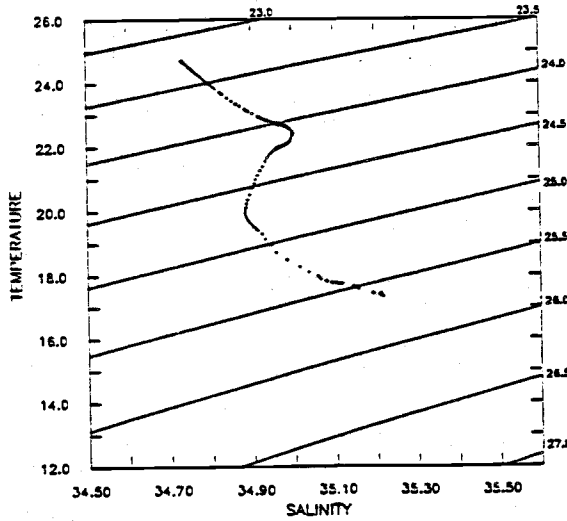
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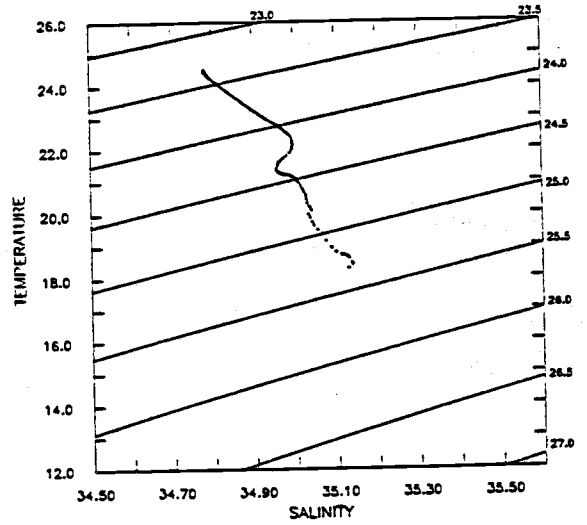
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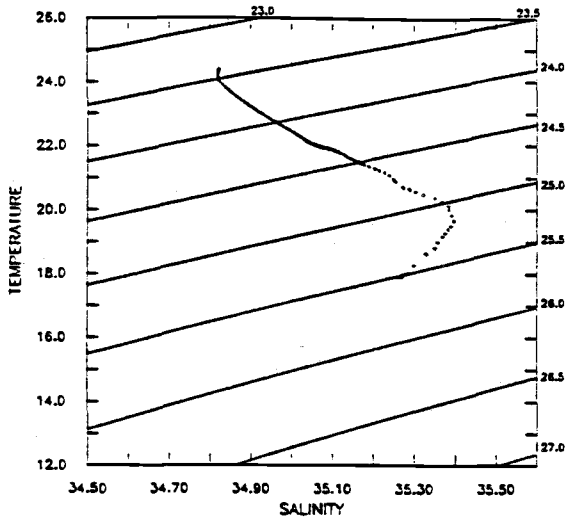
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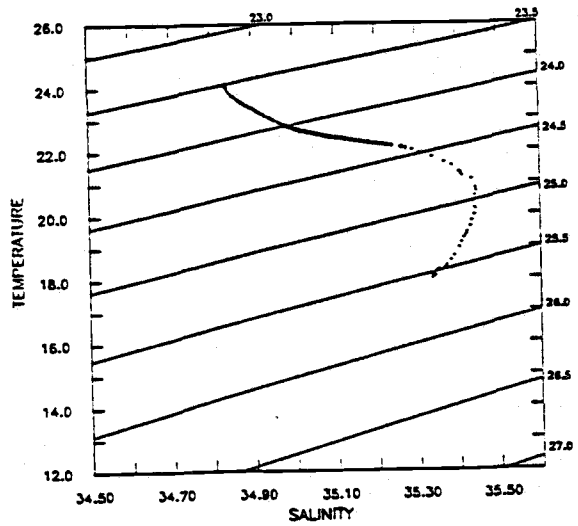
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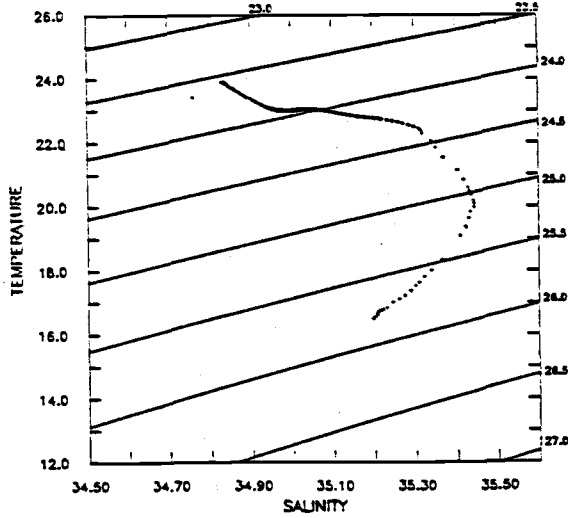
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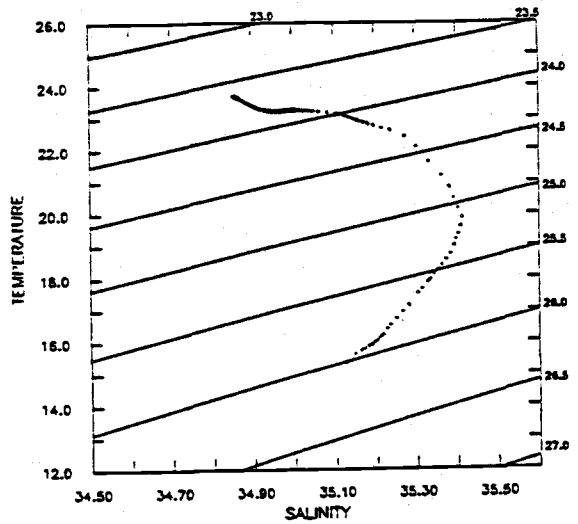
0° 2.5' N LATITUDE



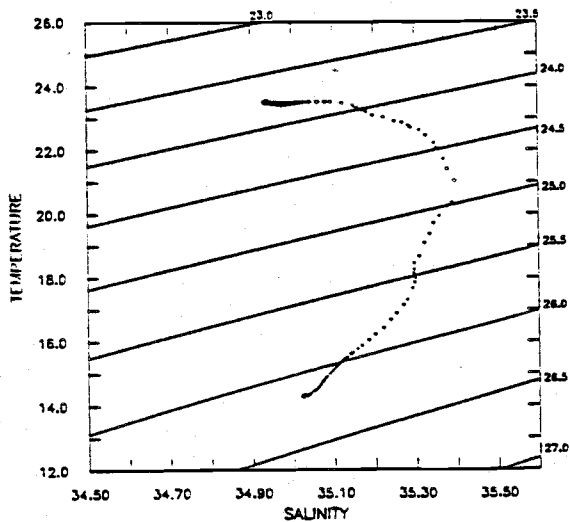
0° 17.5' S LATITUDE



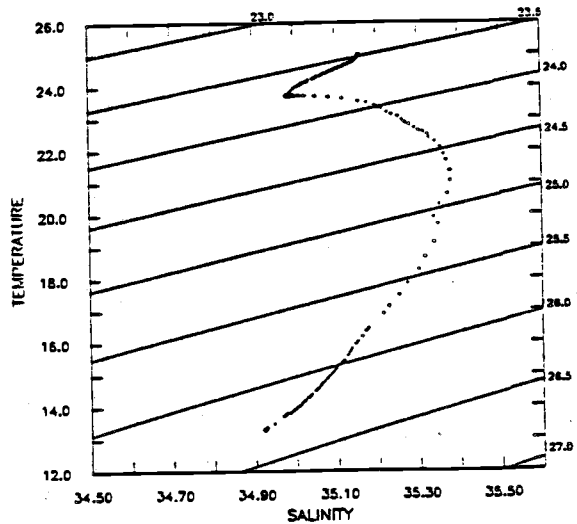
0° 37.5' S LATITUDE



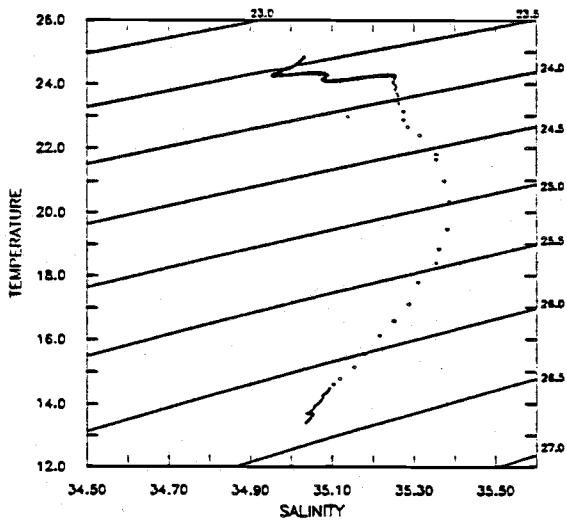
0° 57.5' S LATITUDE



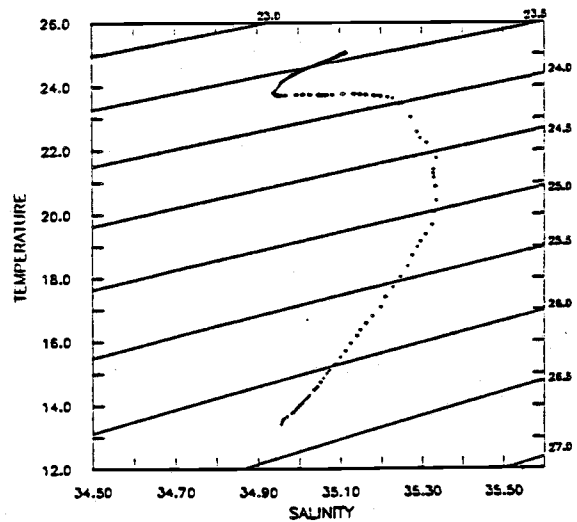
1° 17.5' S LATITUDE



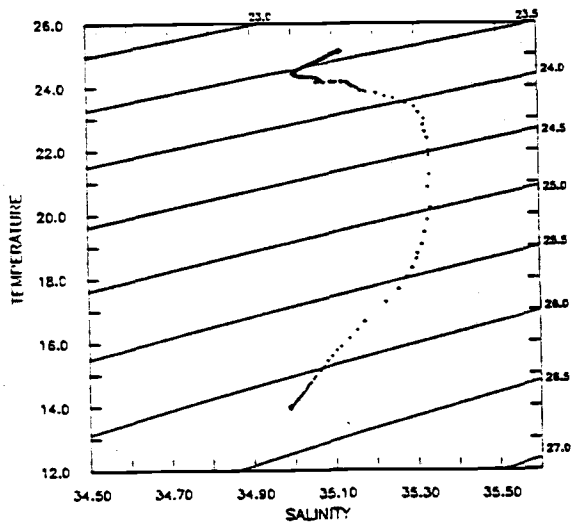
1° 37.5' S LATITUDE



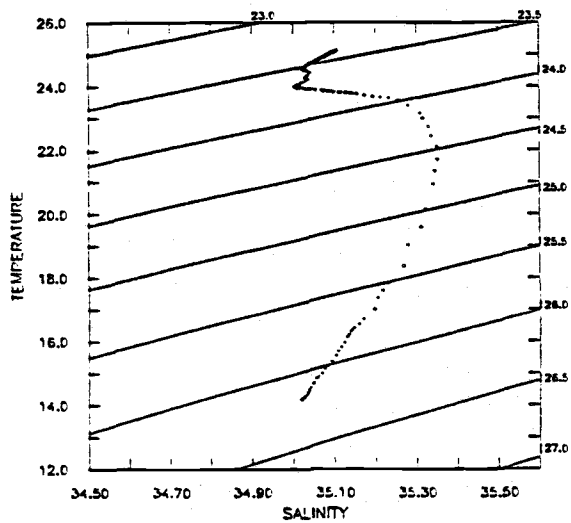
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2° 17.5' S LATITUDE



2° 37.5' S LATITUDE

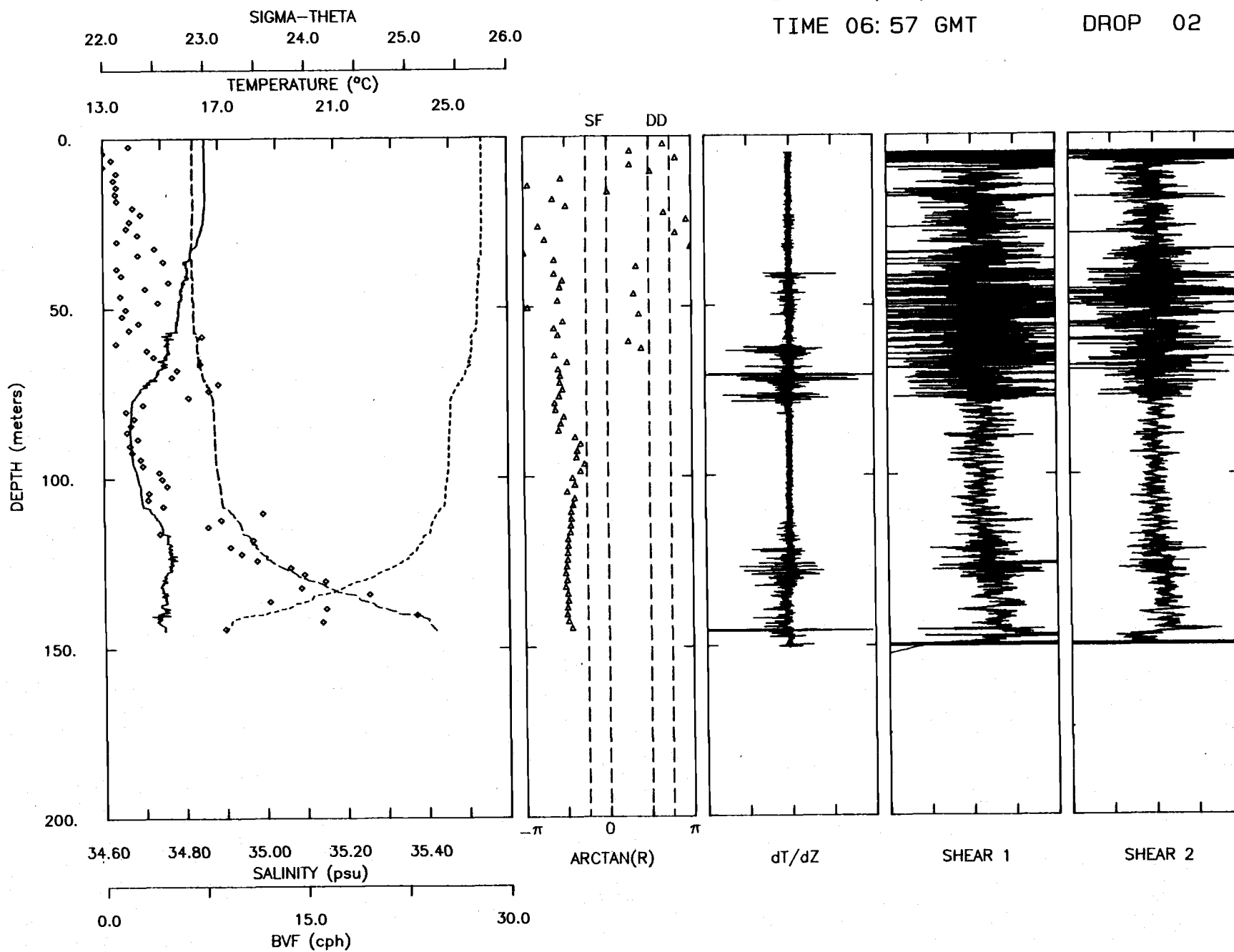


2° 57.5' S LATITUDE

The following section contains one plot for every hour that data was collected during the transect.

DATE 11/15/84
TIME 06:57 GMT

TAPE 14
DROP 02

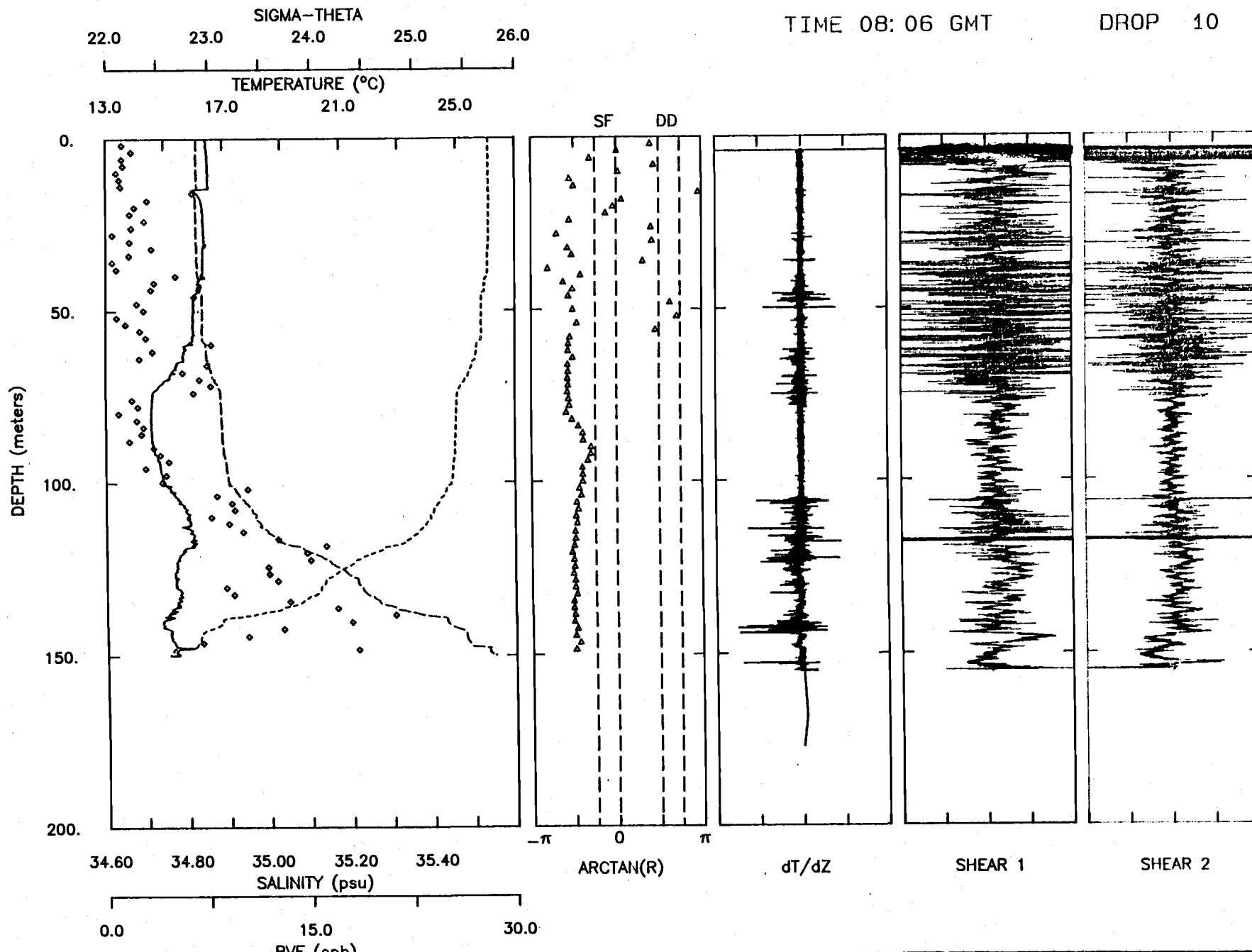


DATE 11/15/84

TAPE 14

TIME 08:06 GMT

DROP 10

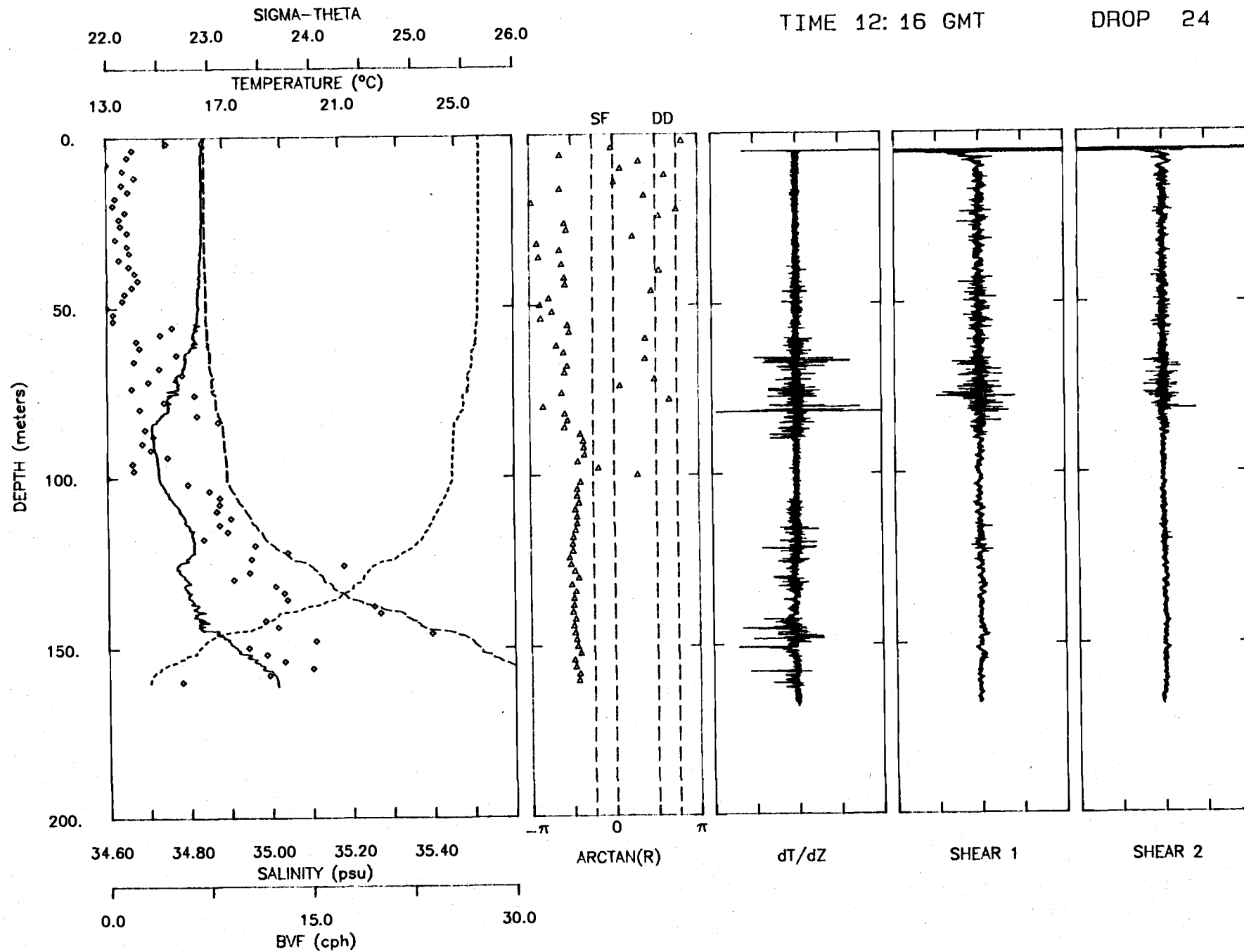


DATE 11/15/84

TAPE 14

TIME 12:16 GMT

DROP 24

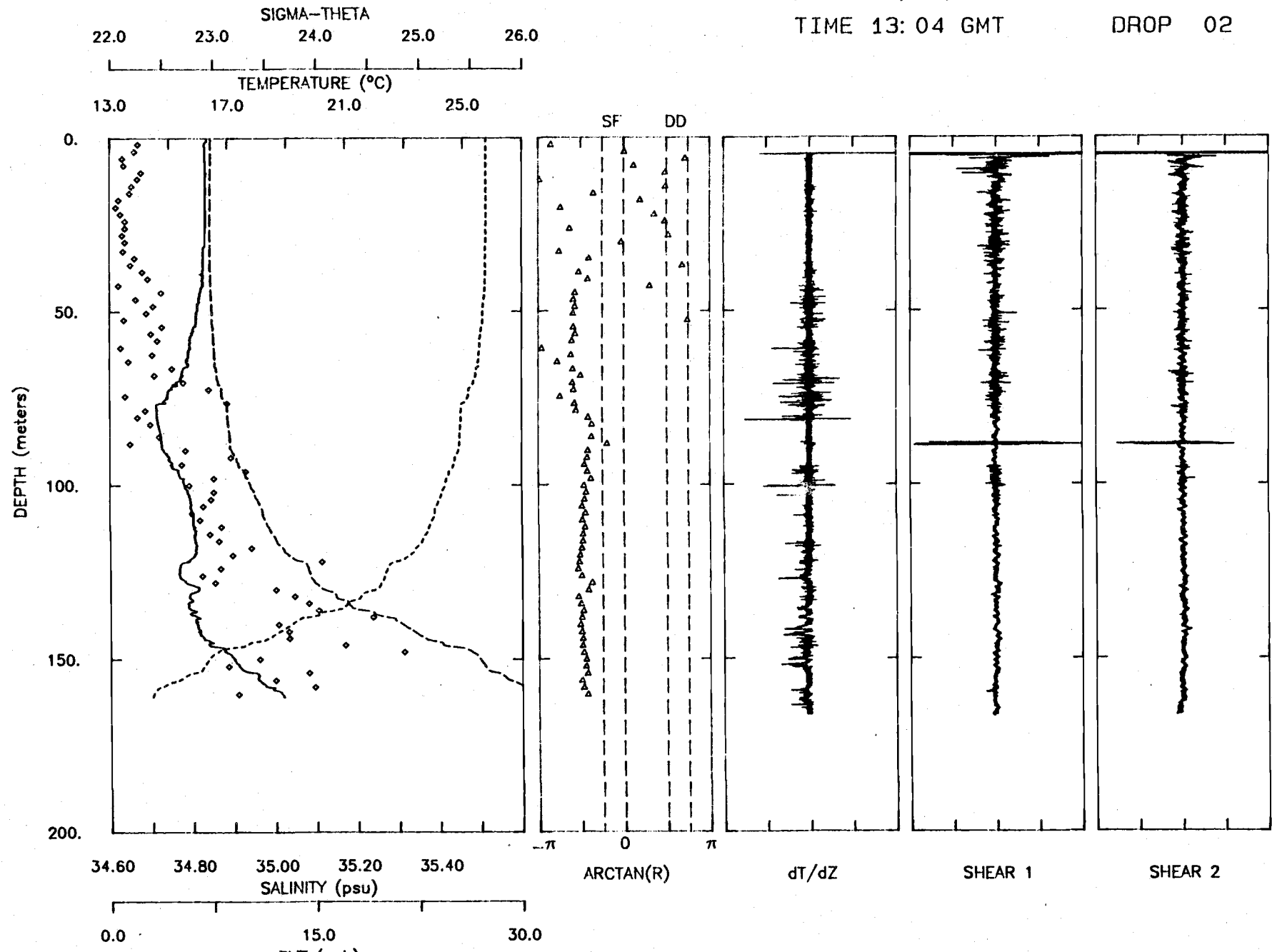


DATE 11/15/84

TAPE 23

TIME 13:04 GMT

DROP 02

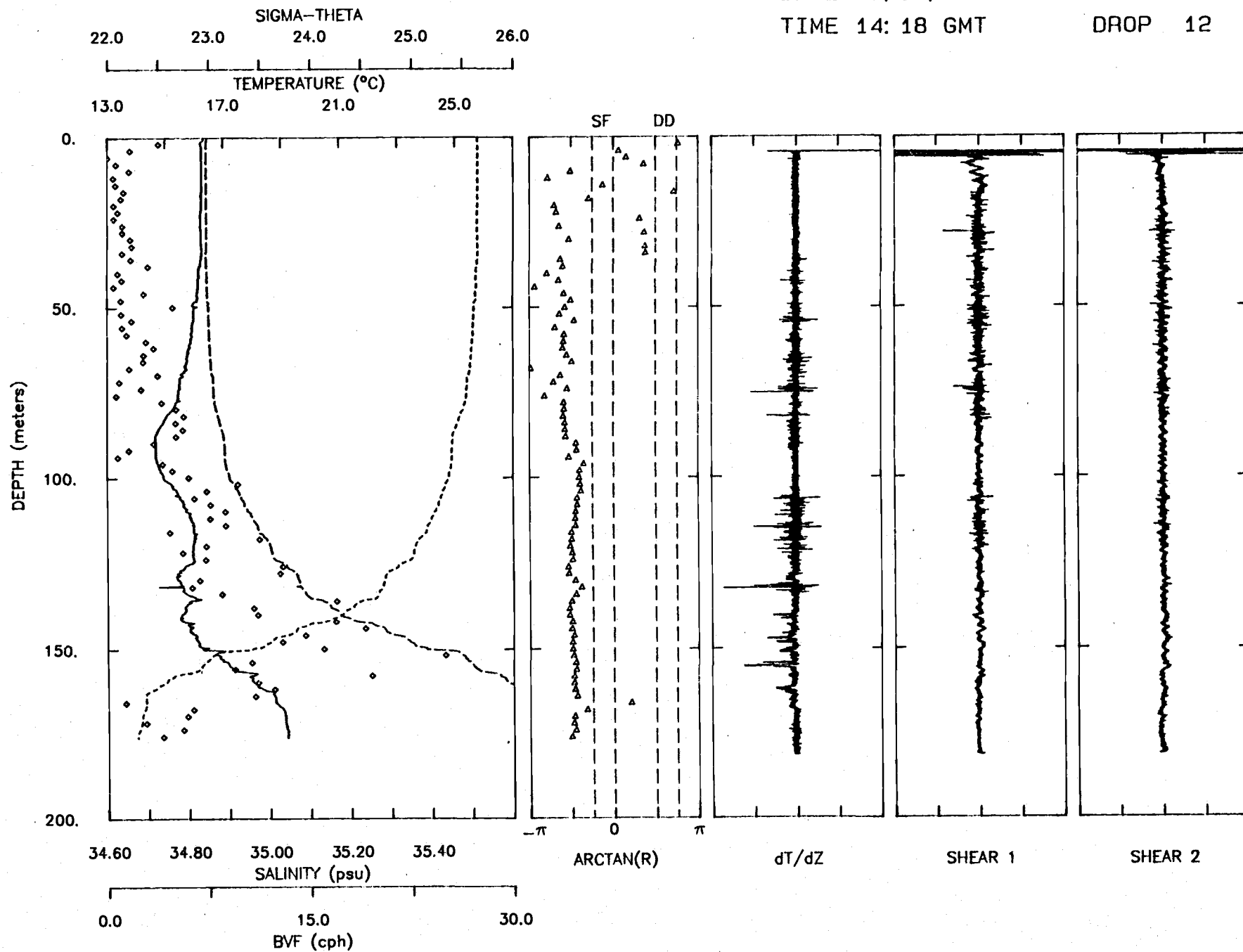


DATE 11/15/84

TAPE 23

TIME 14:18 GMT

DROP 12

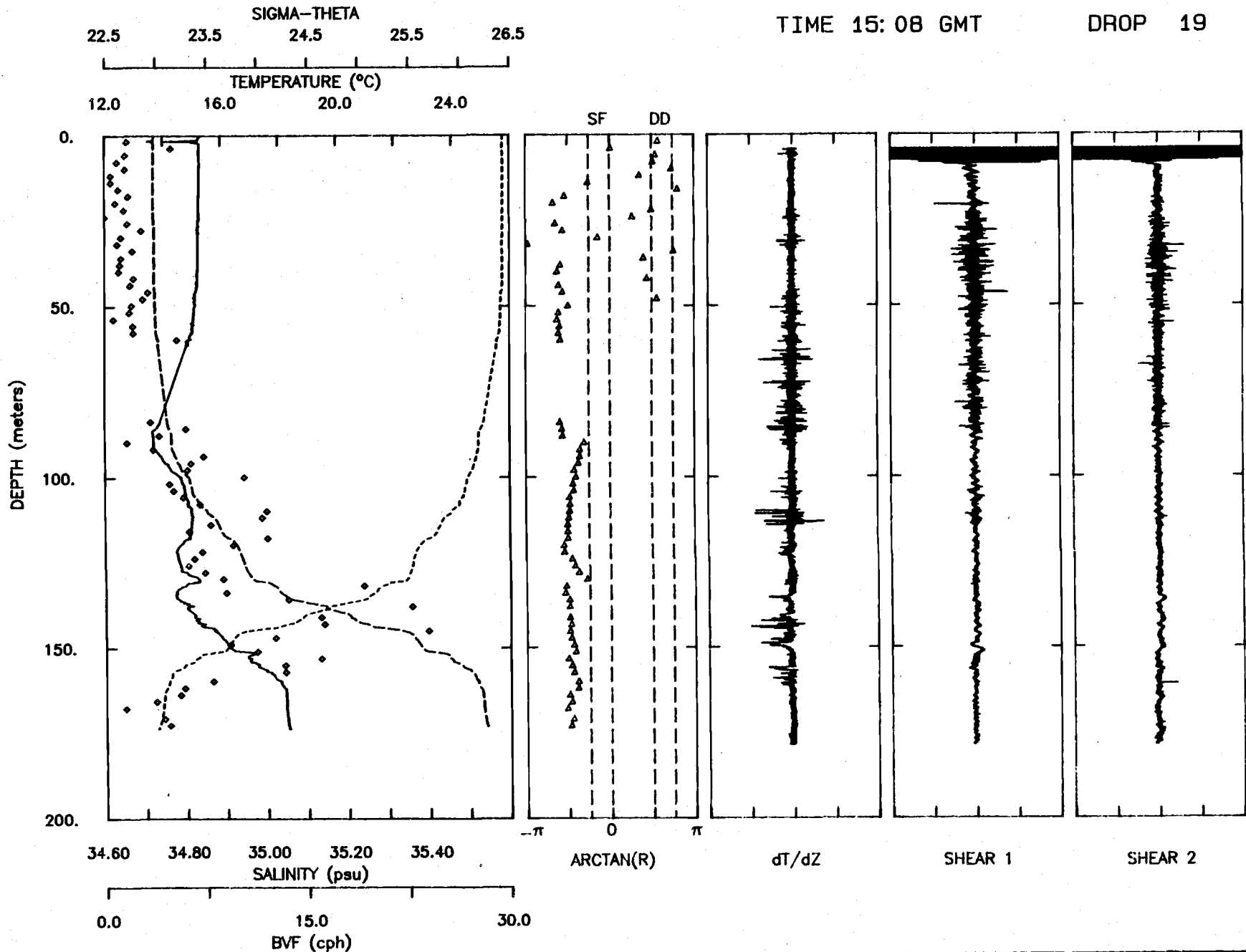


DATE 11/15/84

TAPE 23

TIME 15:08 GMT

DROP 19

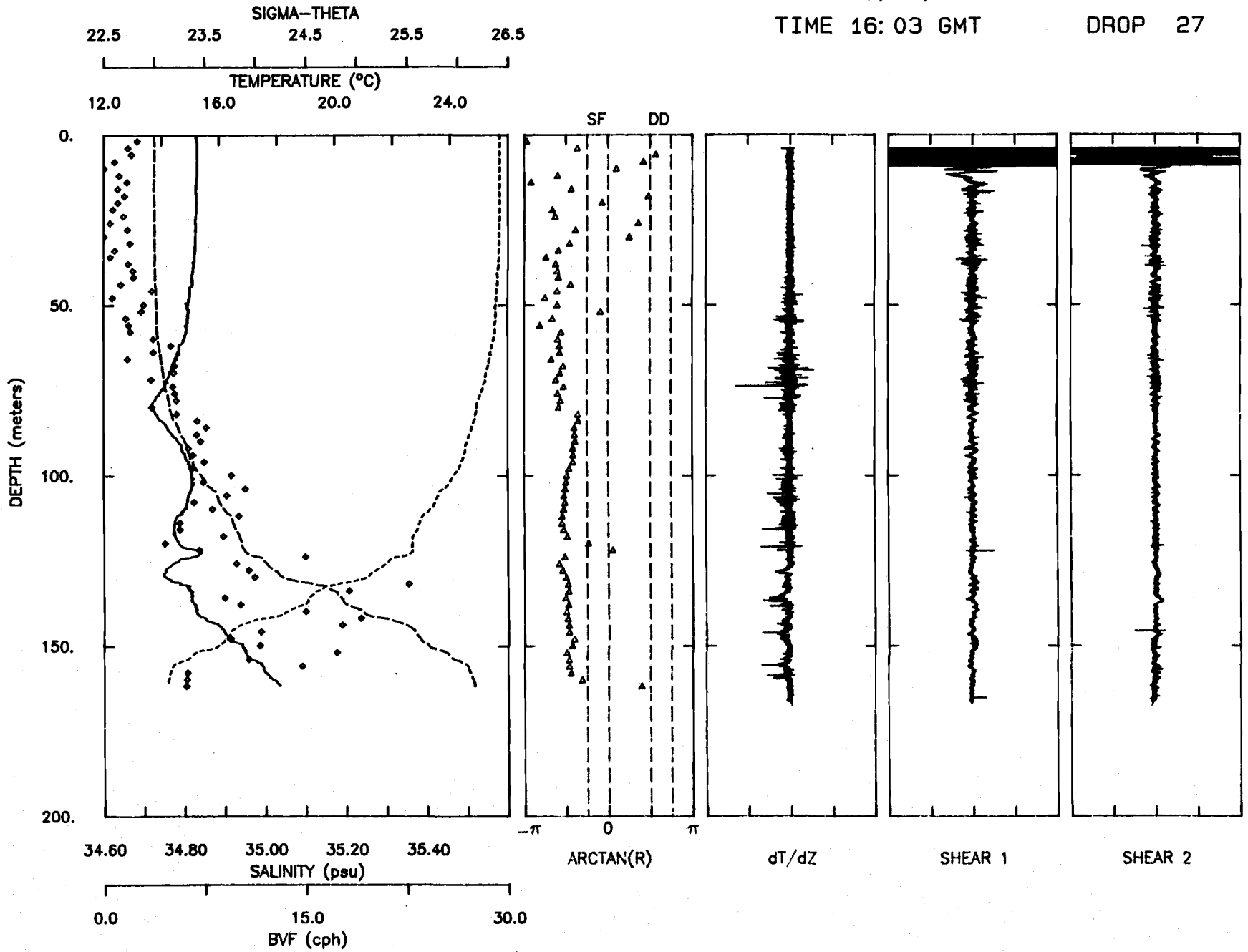


DATE 11/15/84

TAPE 23

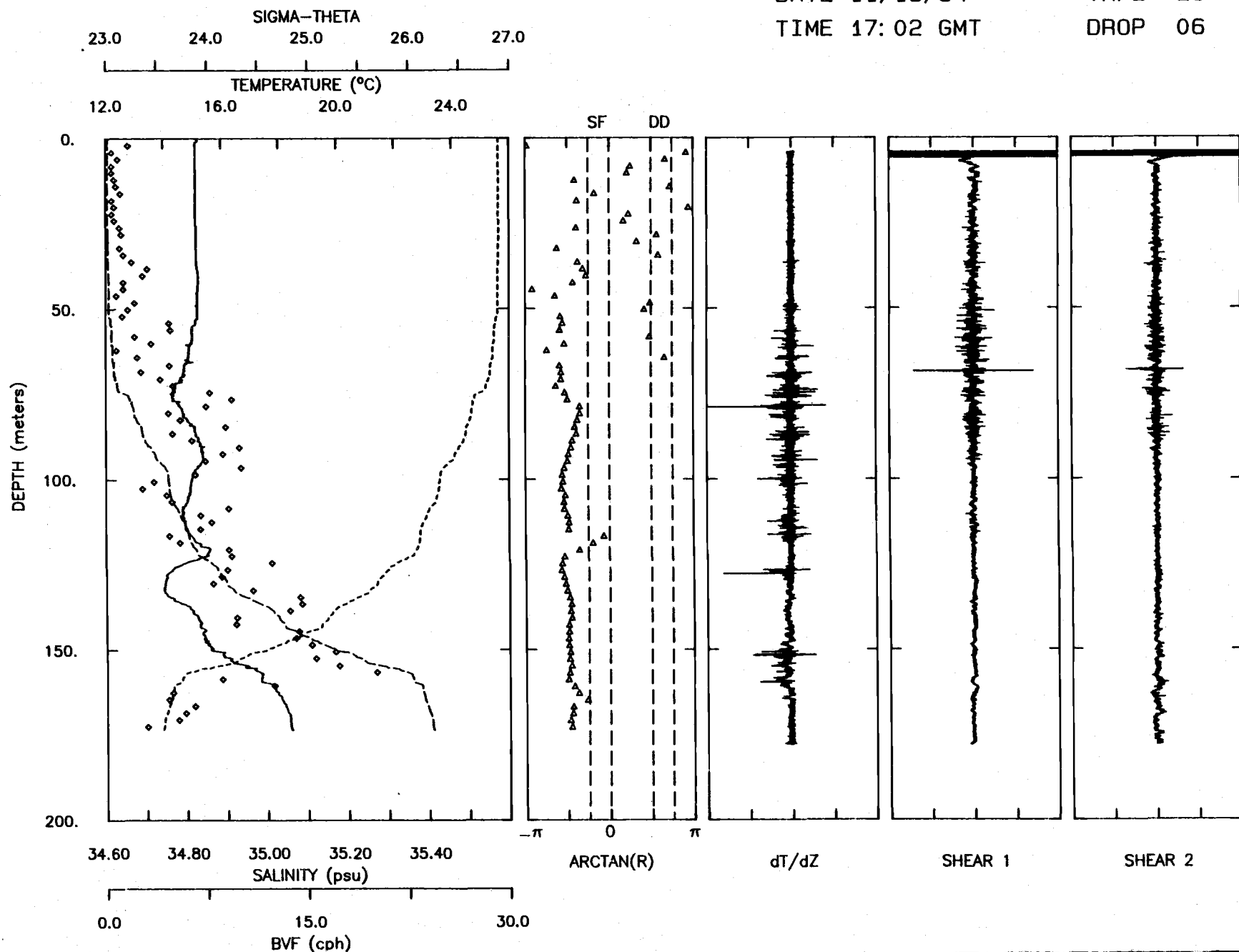
TIME 16:03 GMT

DROP 27



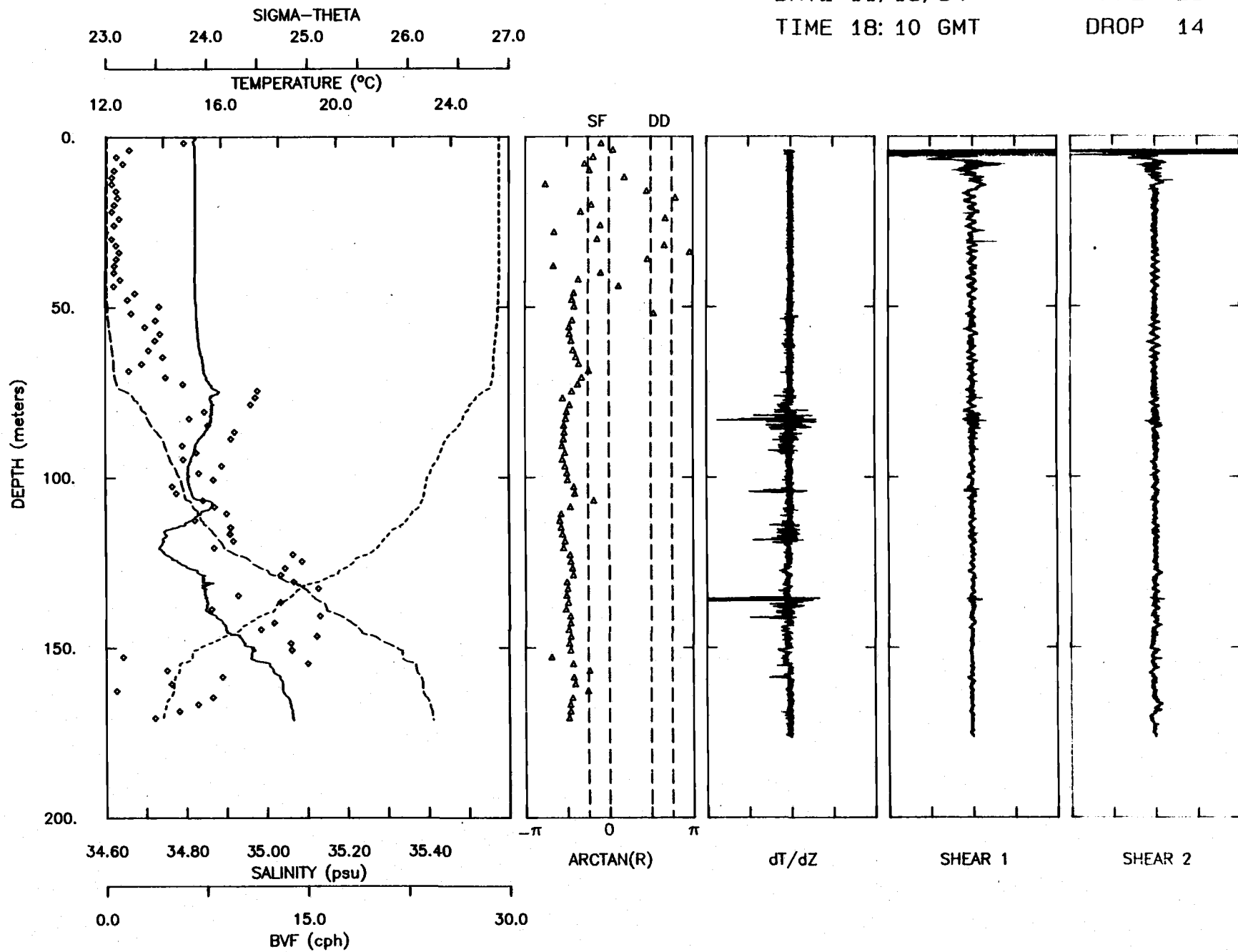
DATE 11/15/84
TIME 17:02 GMT

TAPE 26
DROP 06



DATE 11/15/84
TIME 18:10 GMT

TAPE 26
DROP 14

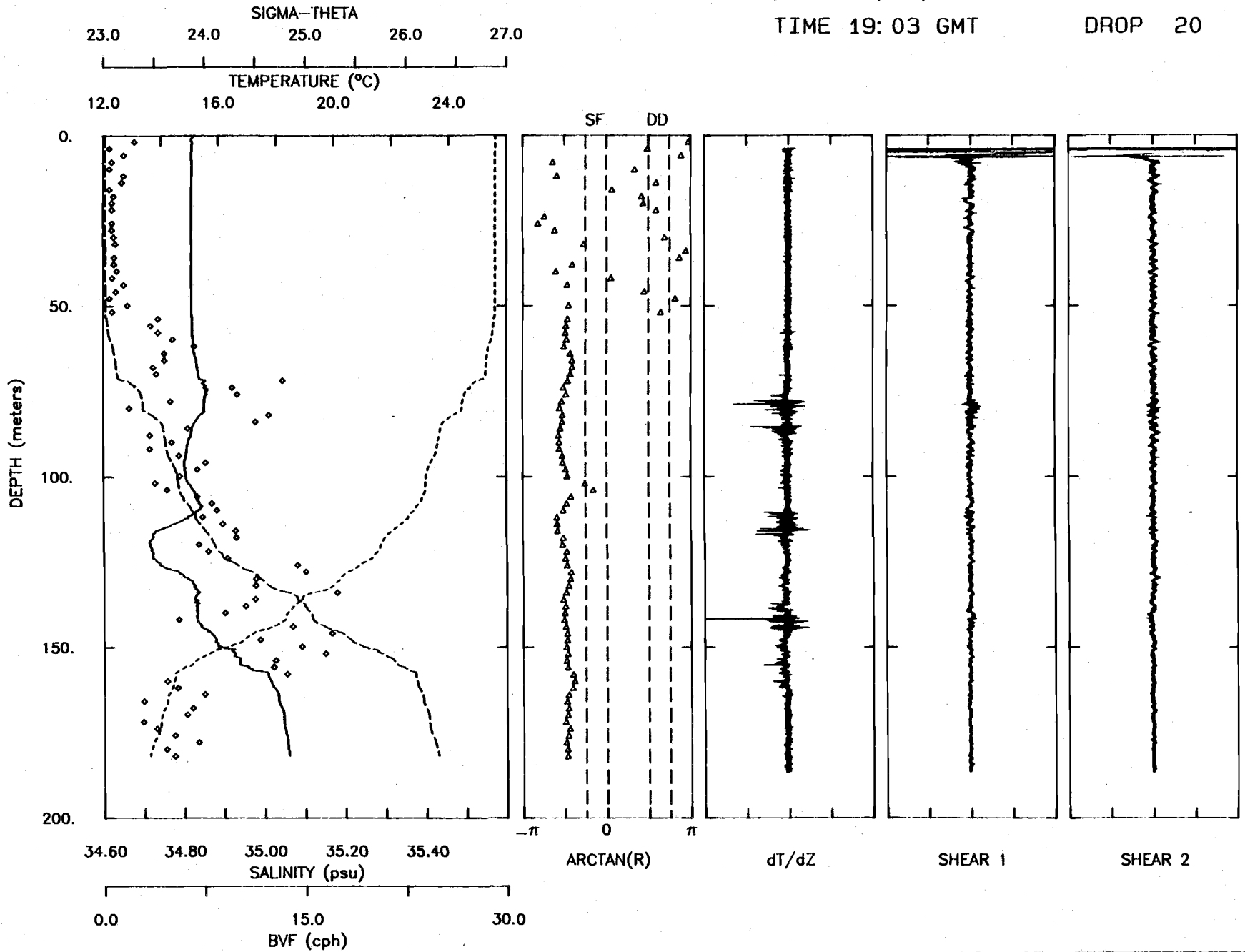


DATE 11/15/84

TAPE 26

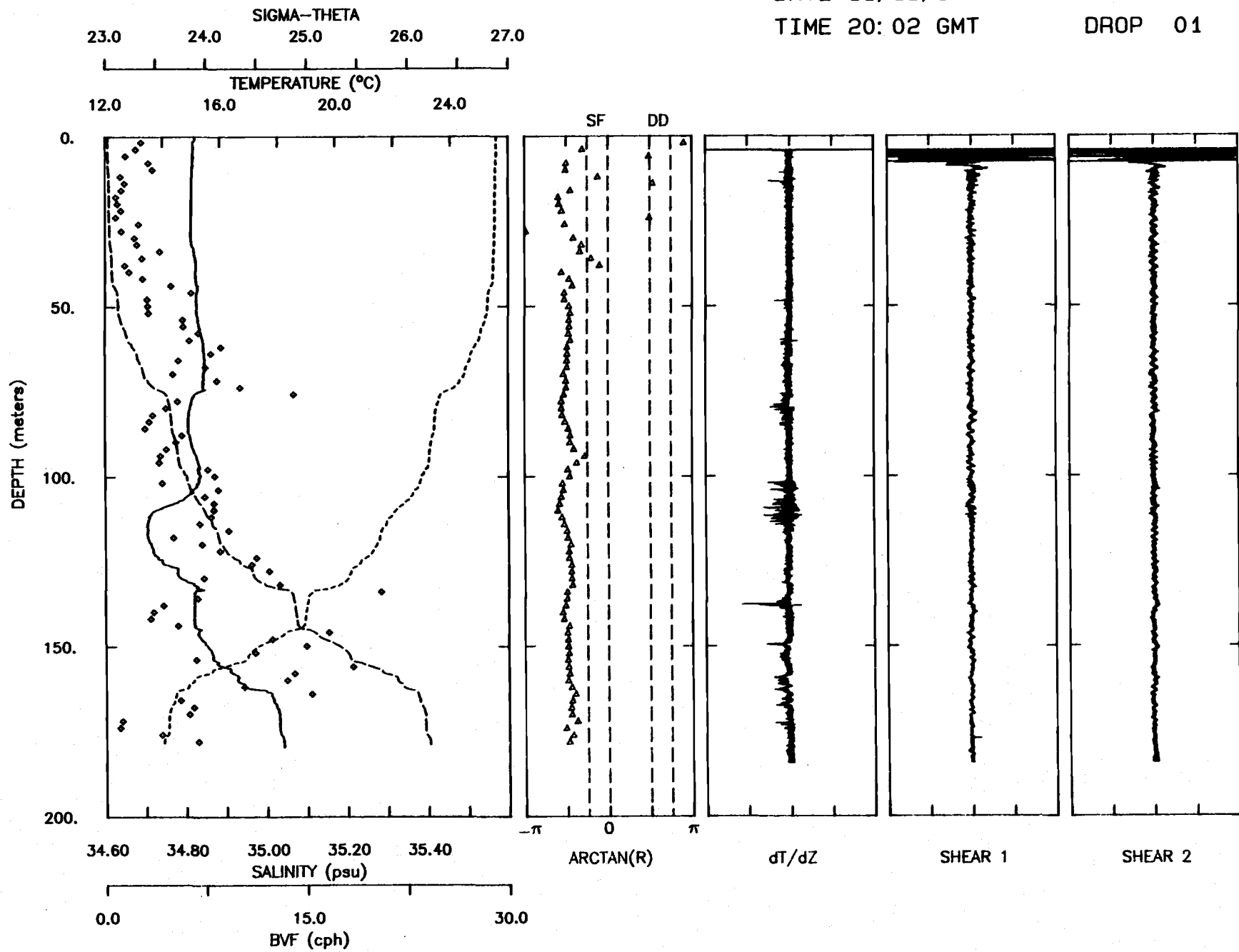
TIME 19:03 GMT

DROP 20



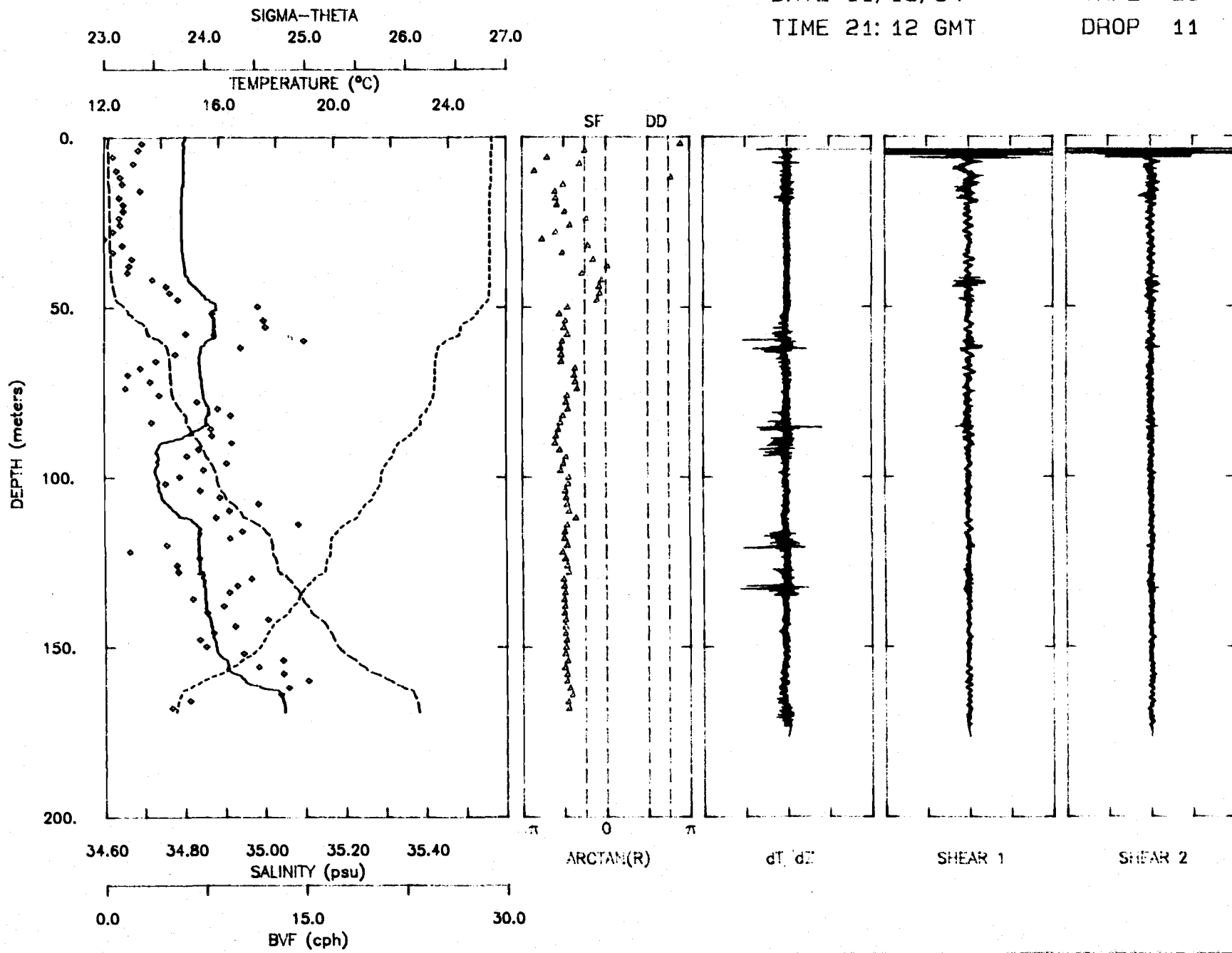
DATE 11/15/84
TIME 20:02 GMT

TAPE 28
DROP 01



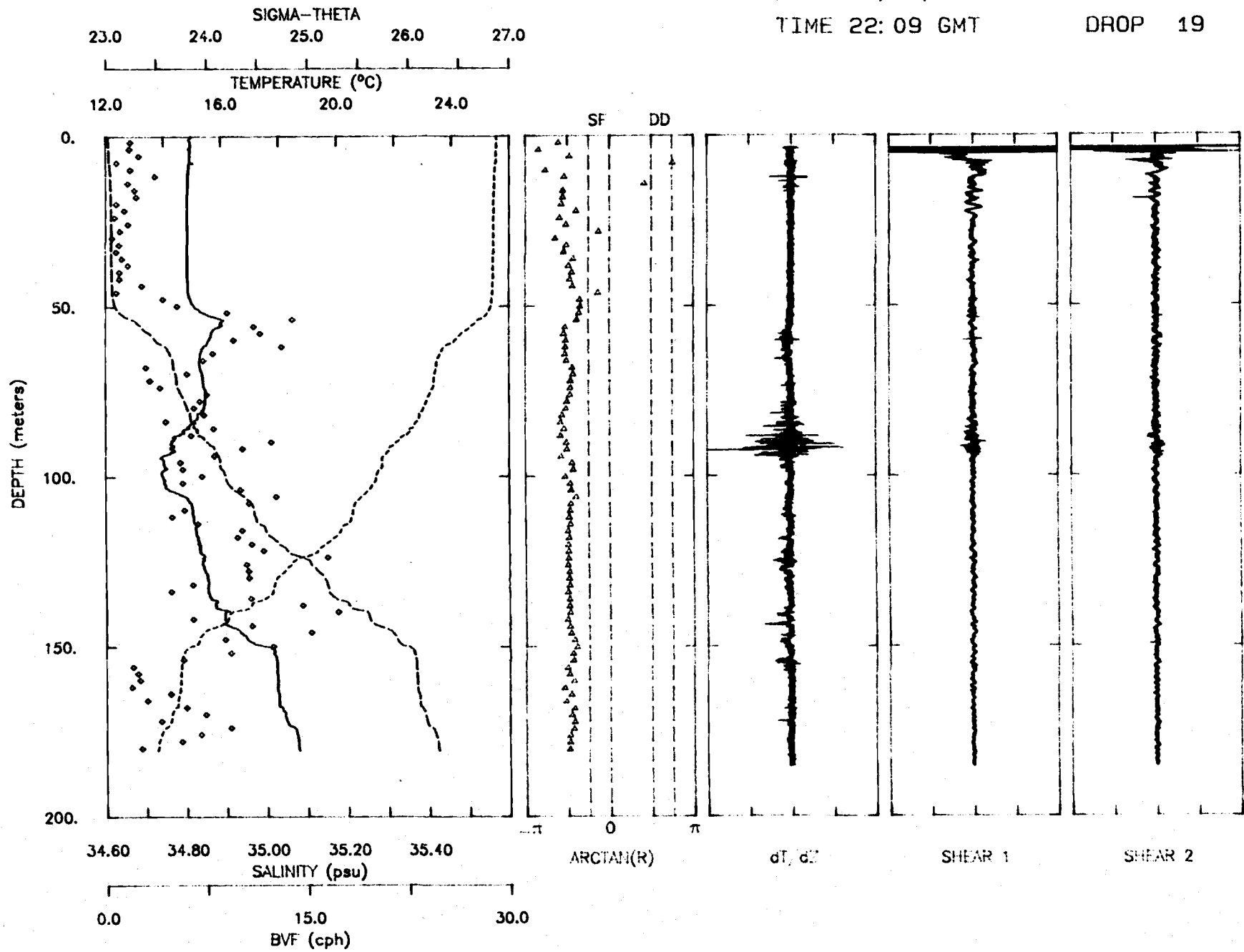
DATE 11/15/84
TIME 21:12 GMT

TAPE 28
DROP 11



DATE 11/15/84
TIME 22:09 GMT

TAPE 28
DROP 19

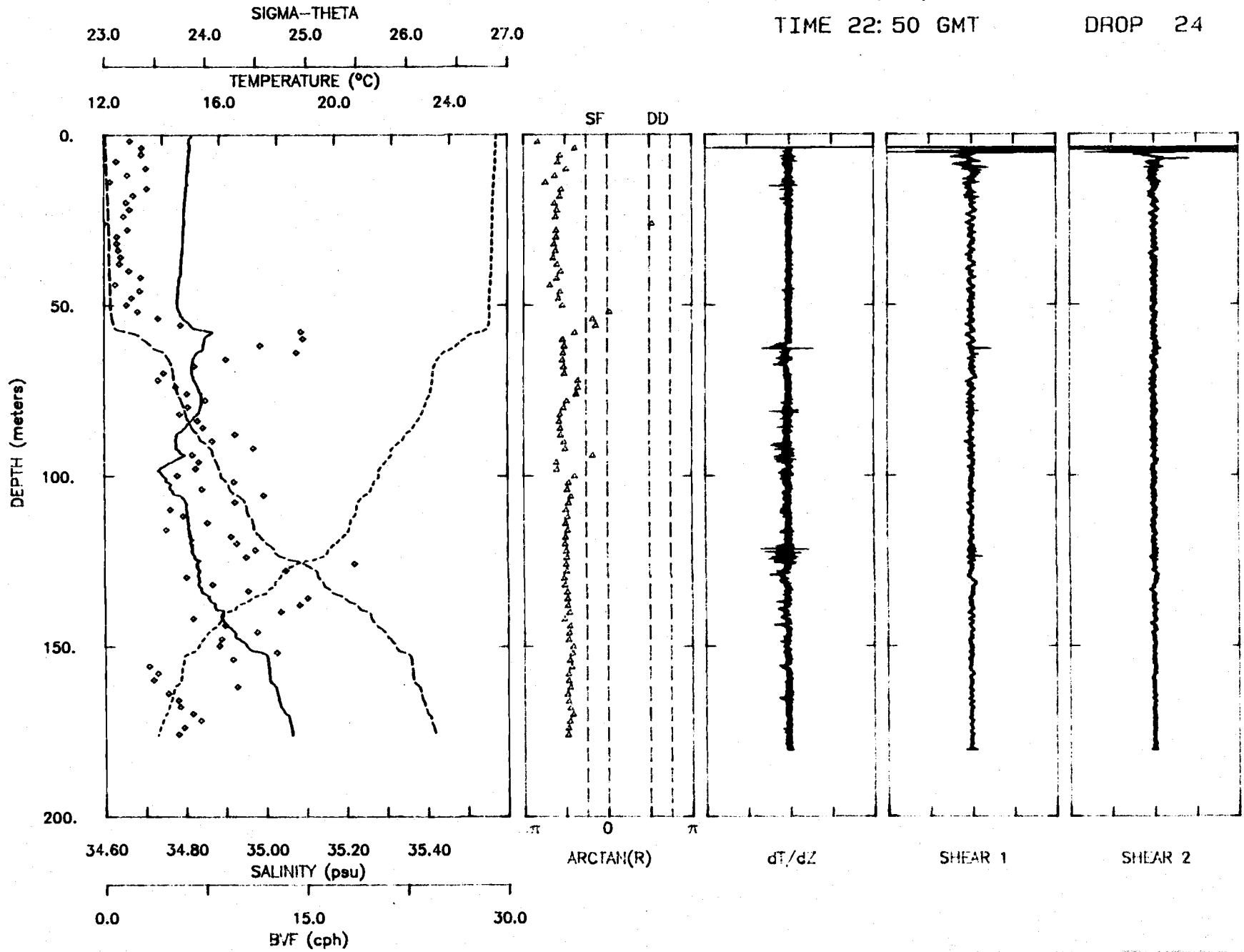


DATE 11/15/84

TAPE 28

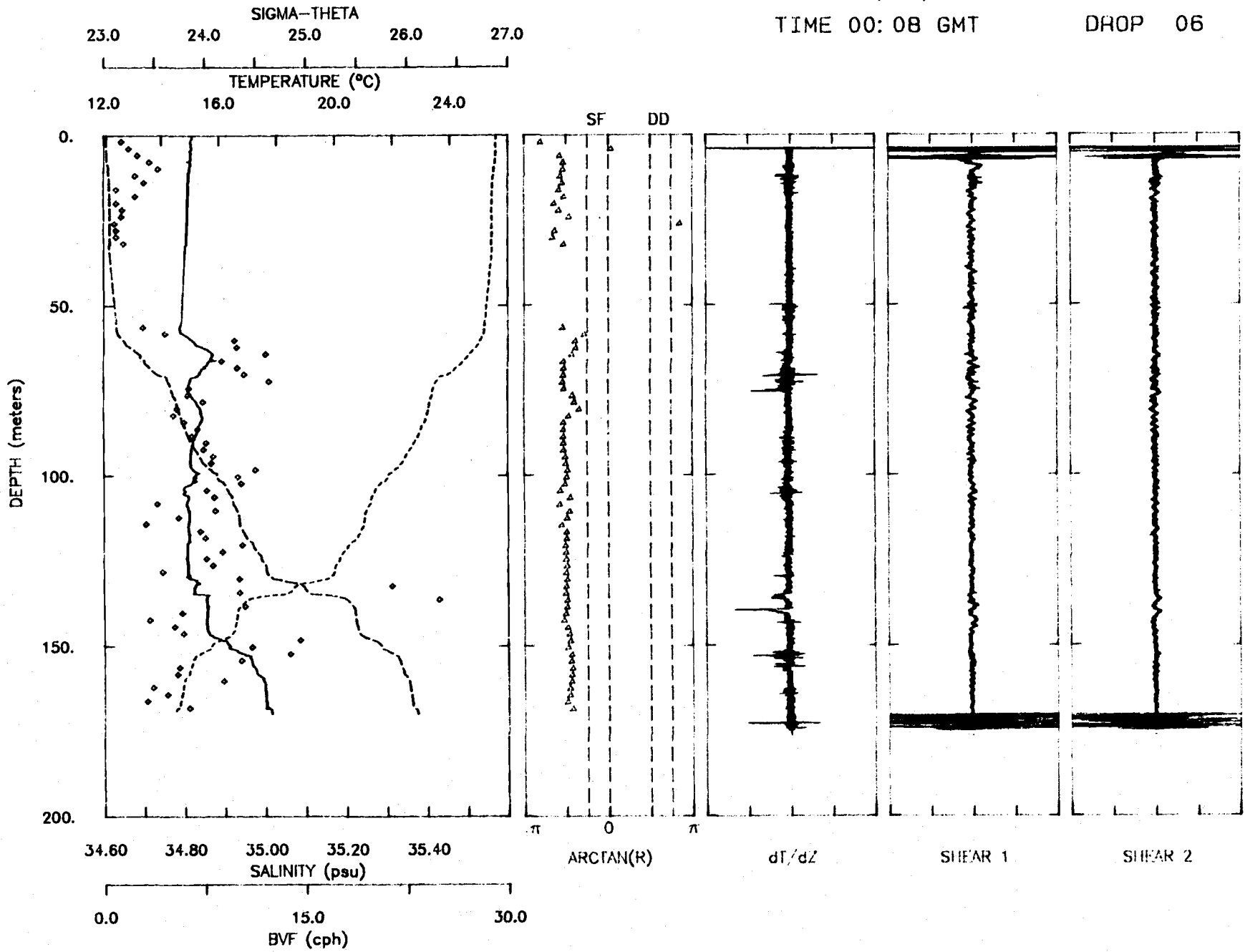
TIME 22:50 GMT

DROP 24



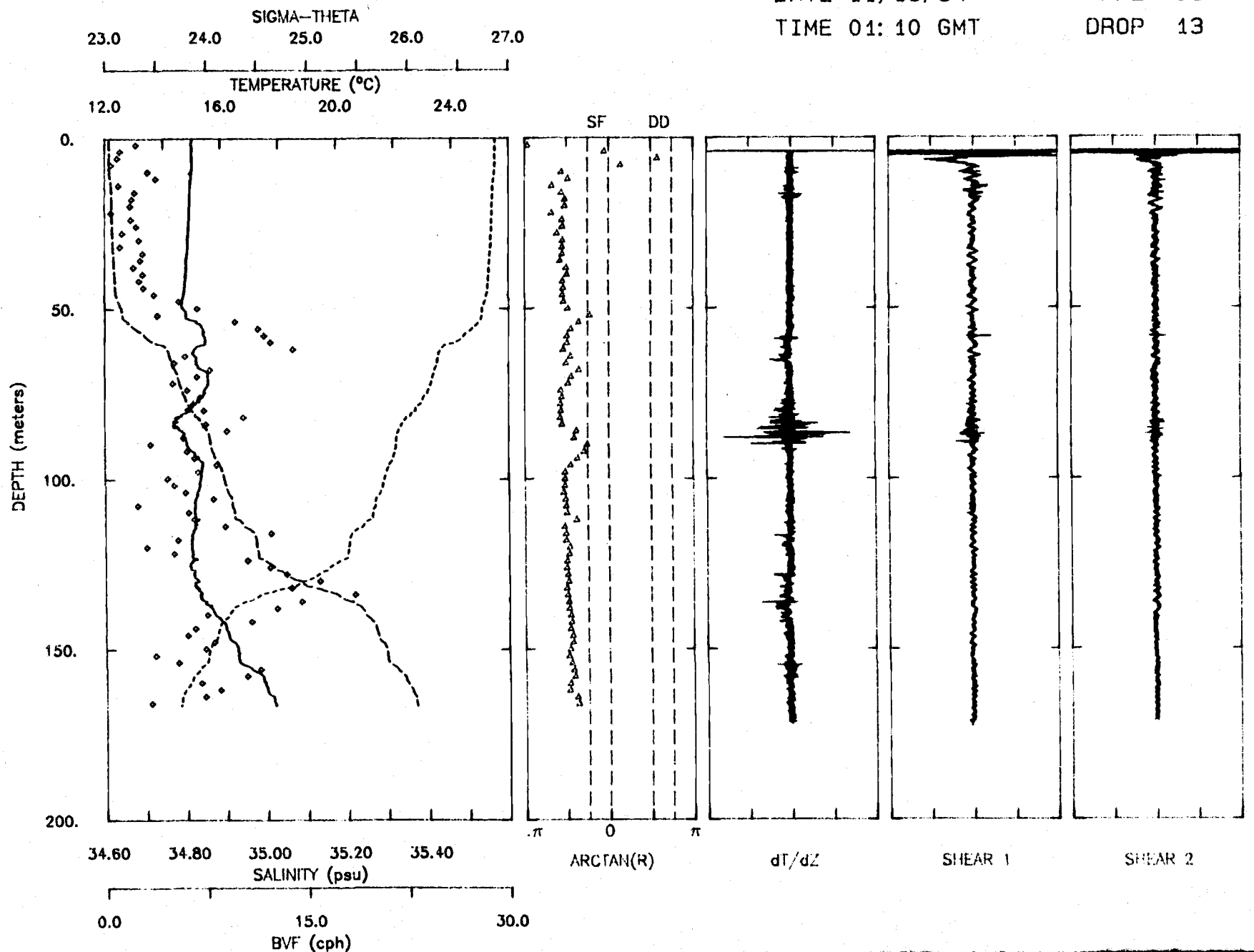
DATE 11/16/84
TIME 00:08 GMT

TAPE 31
DROP 06



DATE 11/16/84
TIME 01:10 GMT

TAPE 31
DROP 13

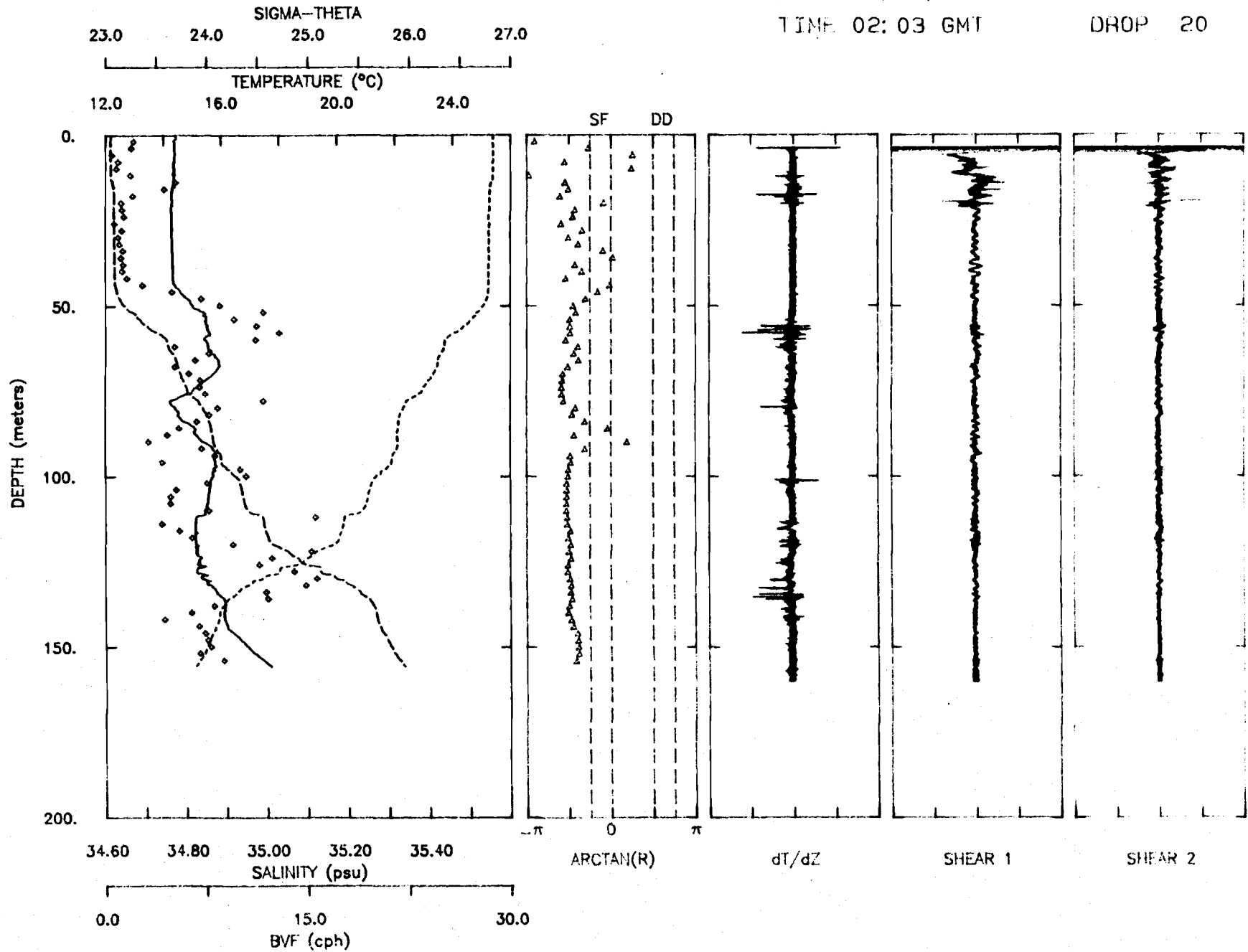


DATE 11/16/84

TAPE 31

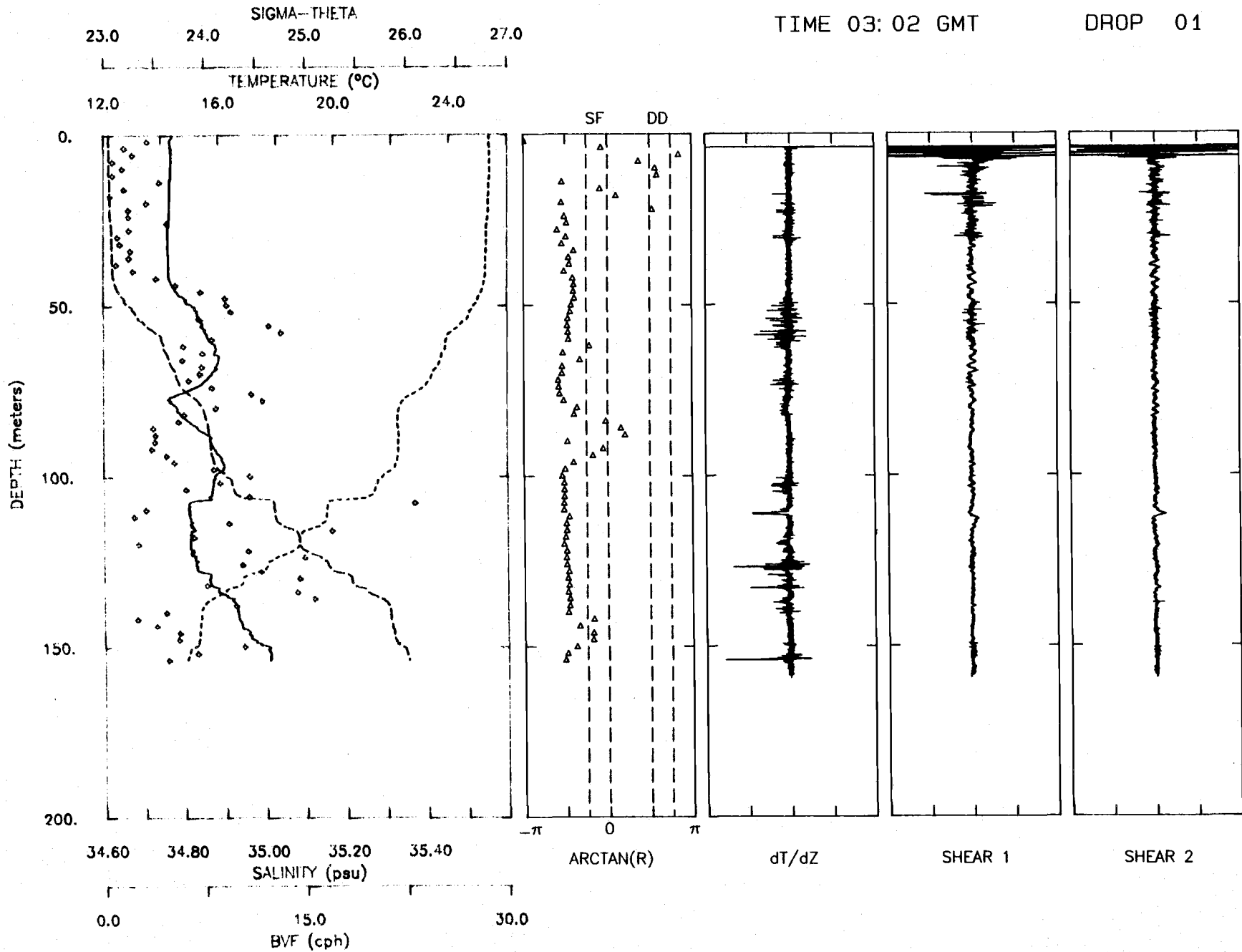
TIME 02:03 GMT

DROP 20



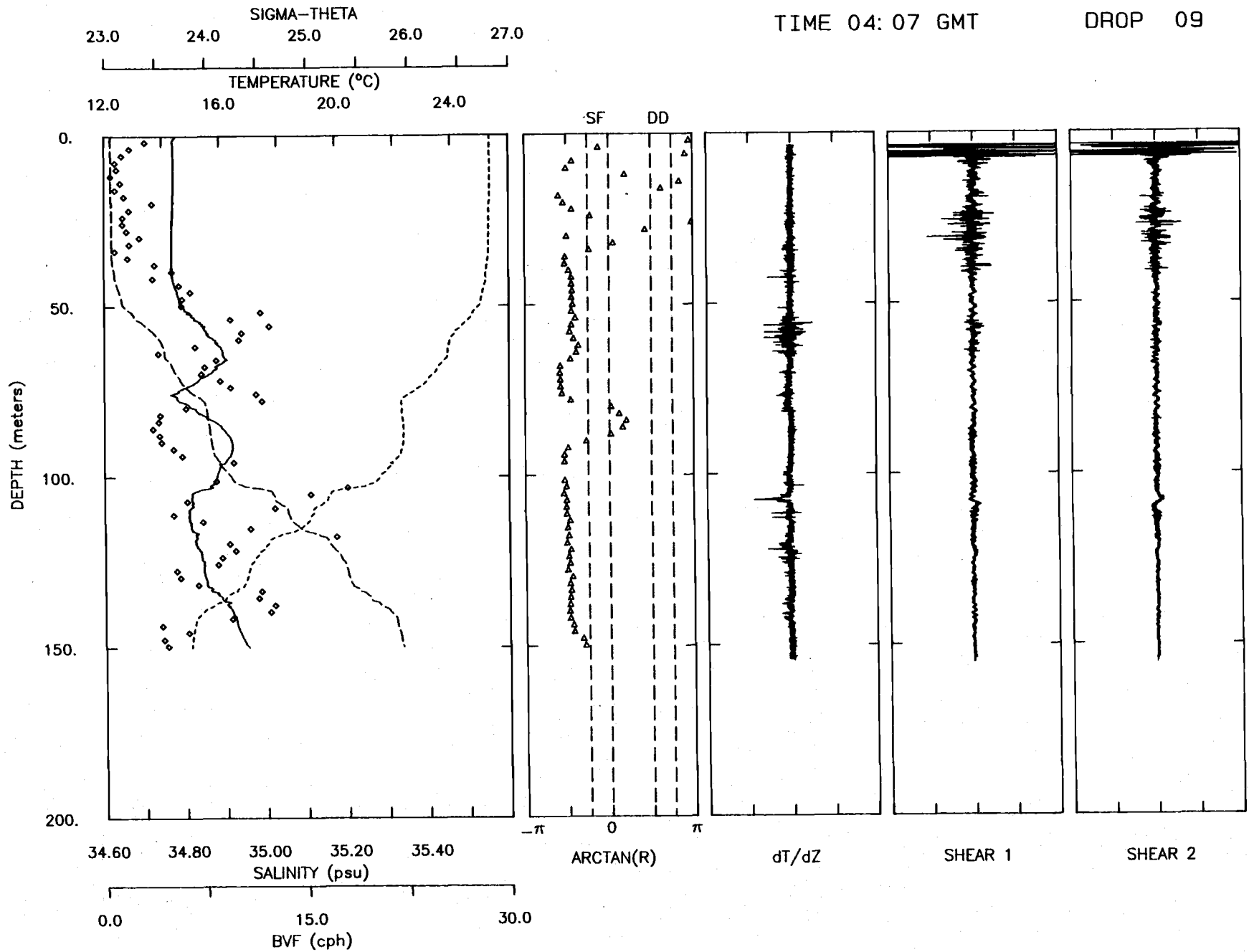
DATE 11/16/84
TIME 03:02 GMT

TAPE 33
DROP 01



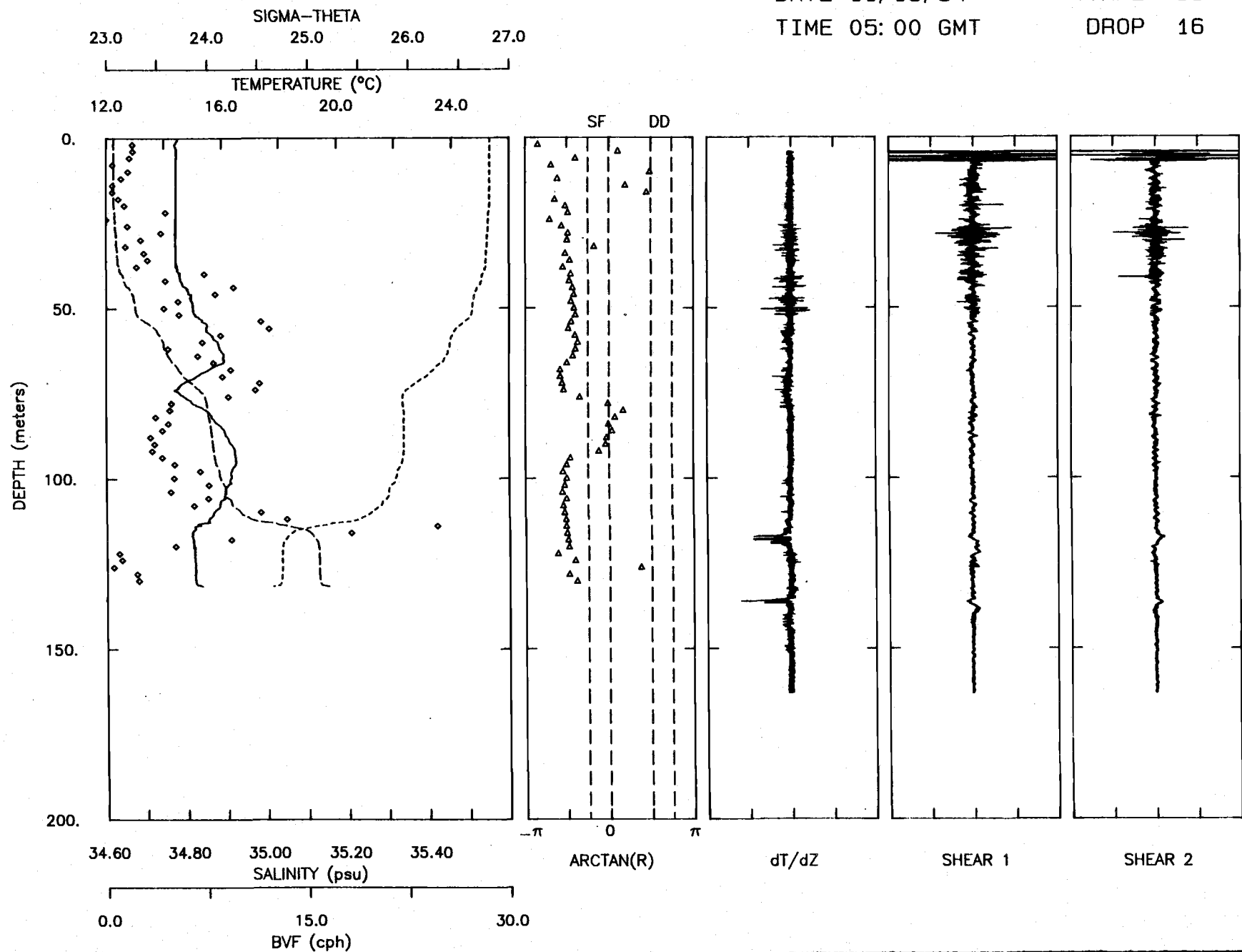
DATE 11/16/84
TIME 04:07 GMT

TAPE 33
DROP 09



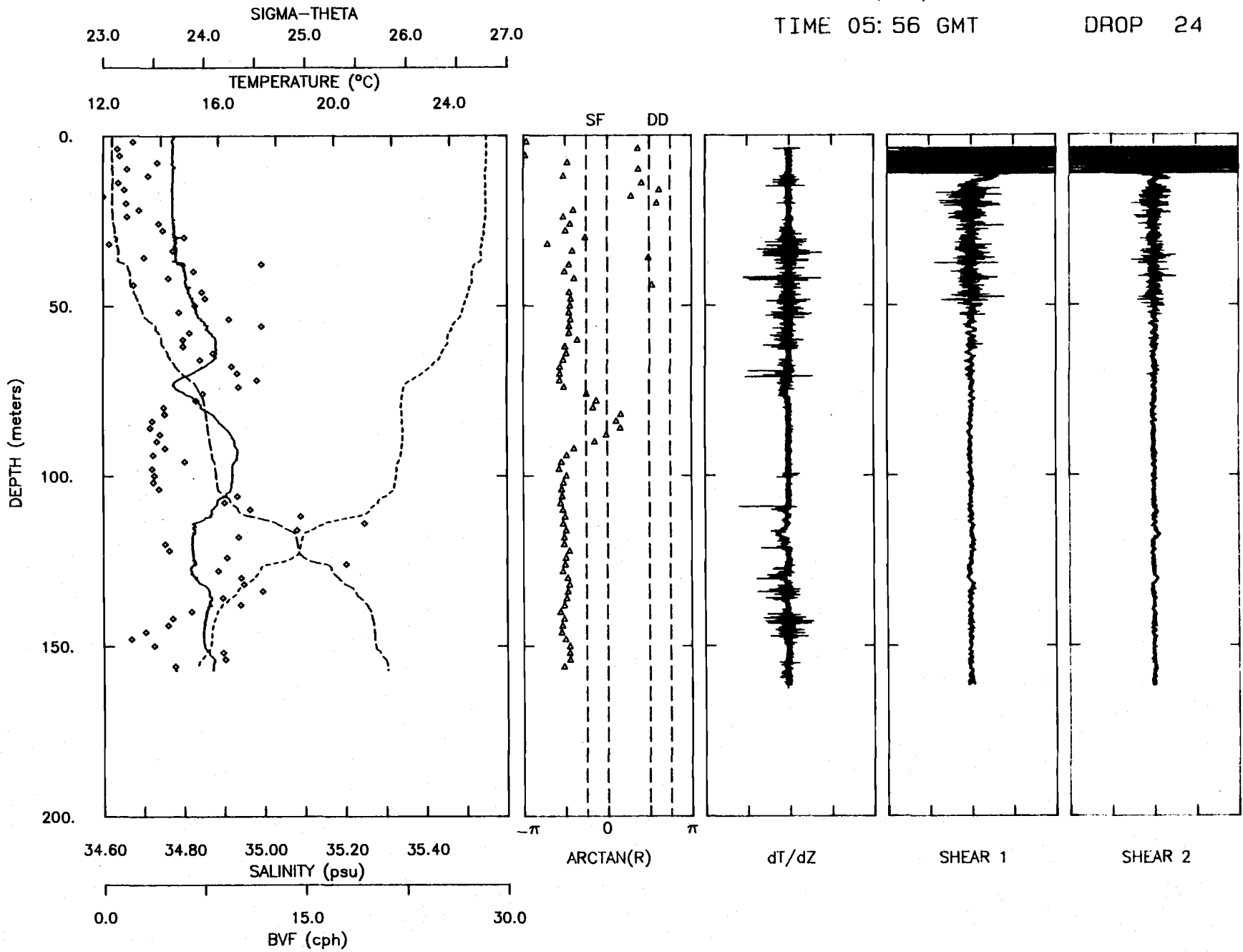
DATE 11/16/84
TIME 05:00 GMT

TAPE 33
DROP 16



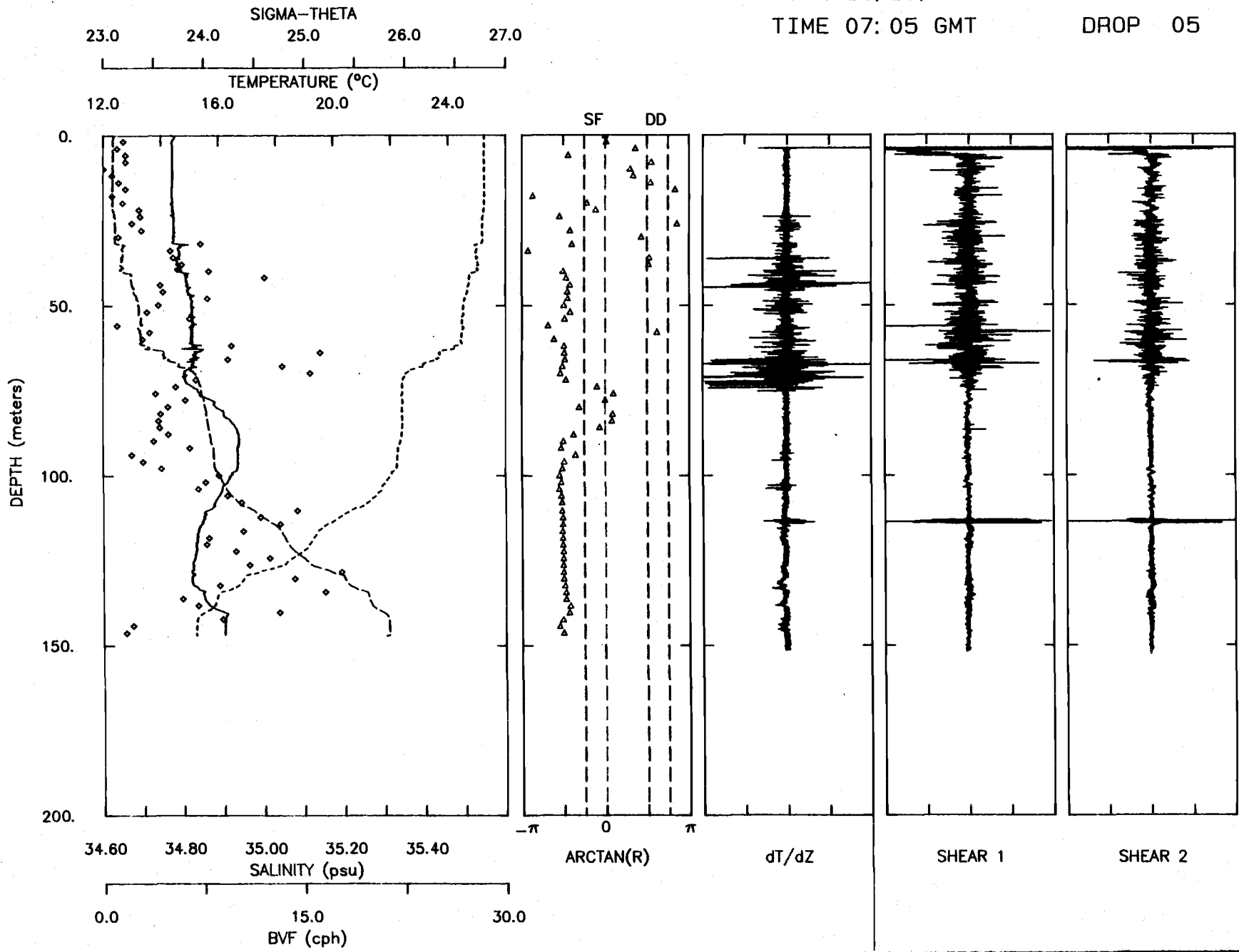
DATE 11/16/84
TIME 05:56 GMT

TAPE 33
DROP 24



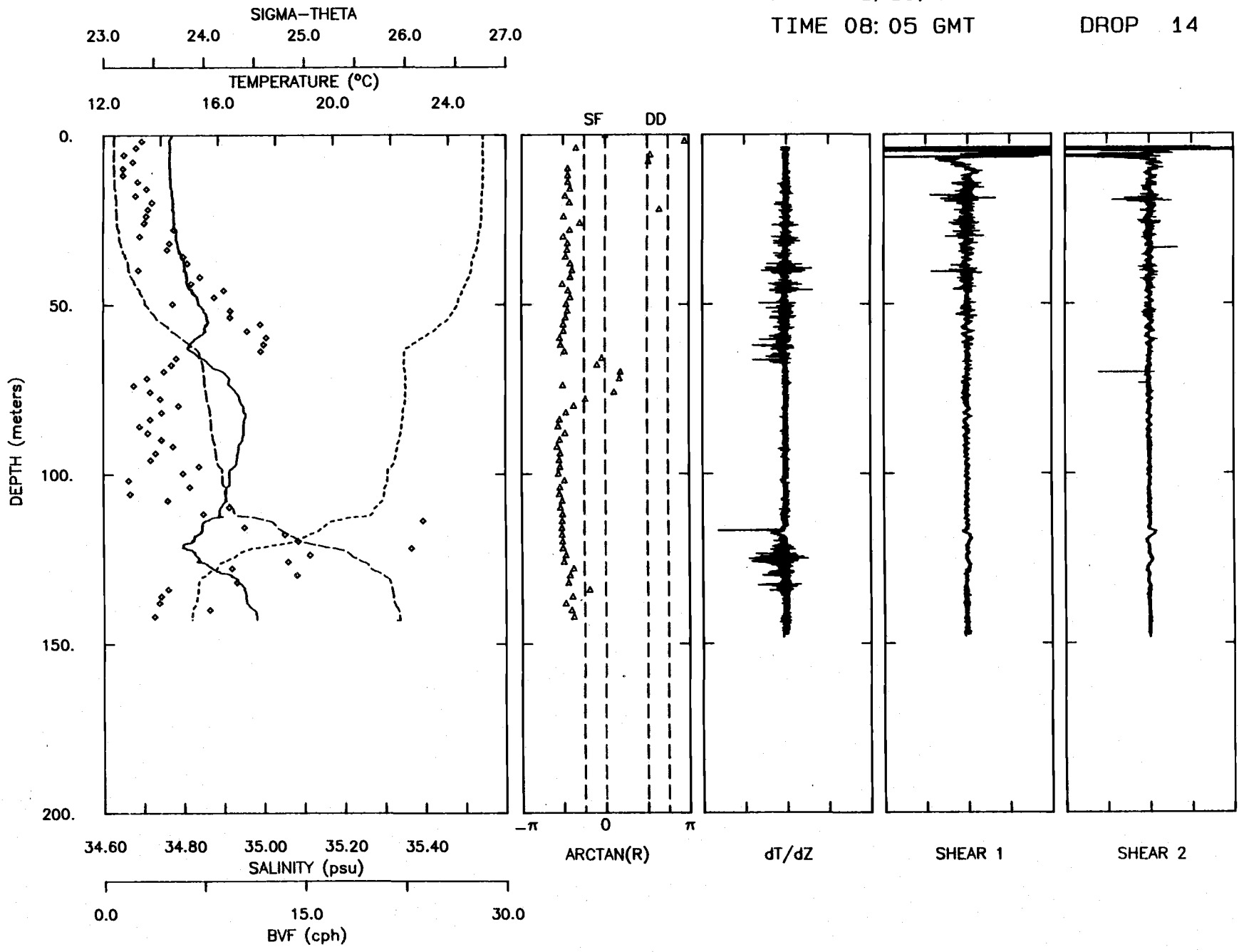
DATE 11/16/84
TIME 07:05 GMT

TAPE 35
DROP 05



DATE 11/16/84
TIME 08:05 GMT

TAPE 35
DROP 14

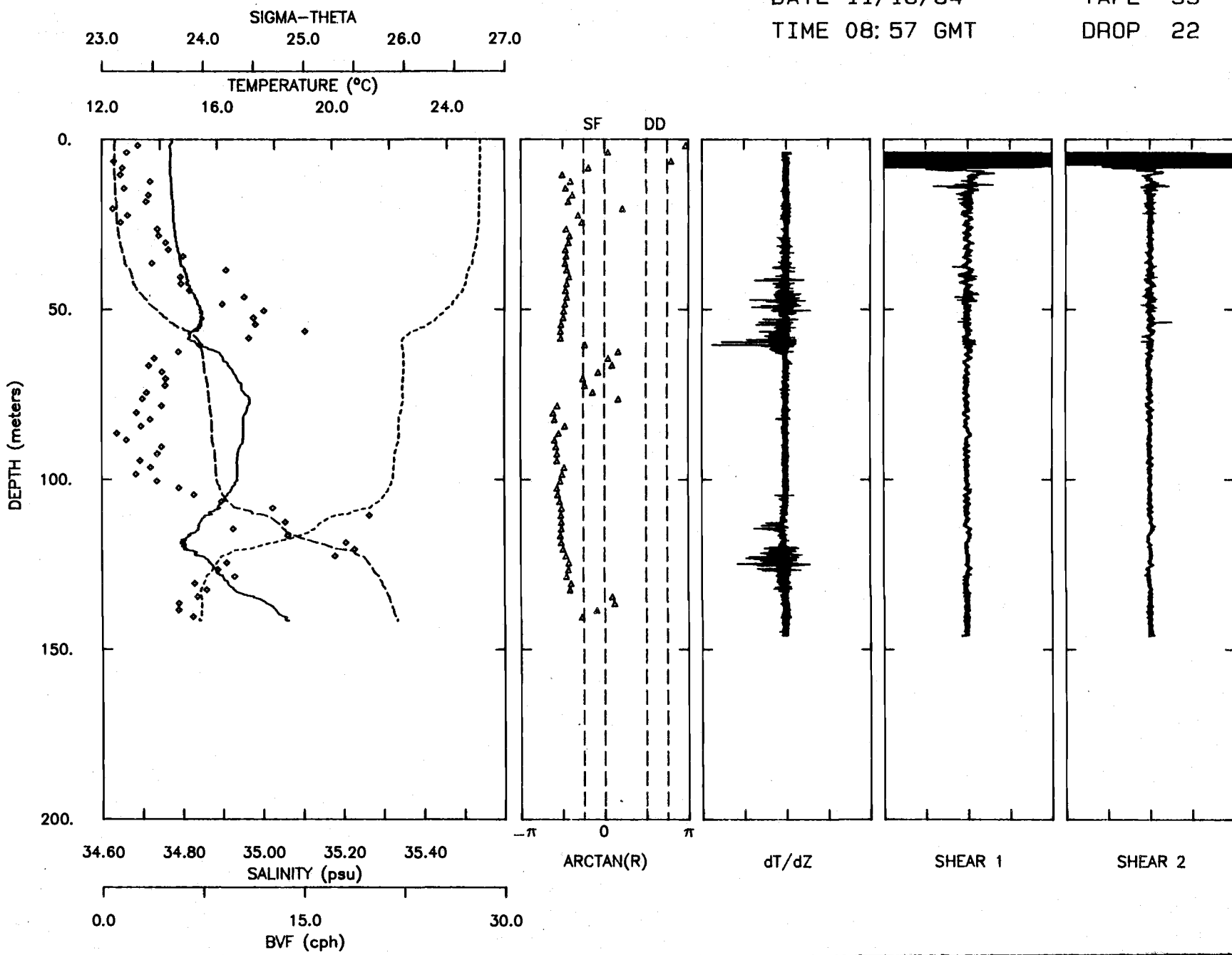


DATE 11/16/84

TAPE 35

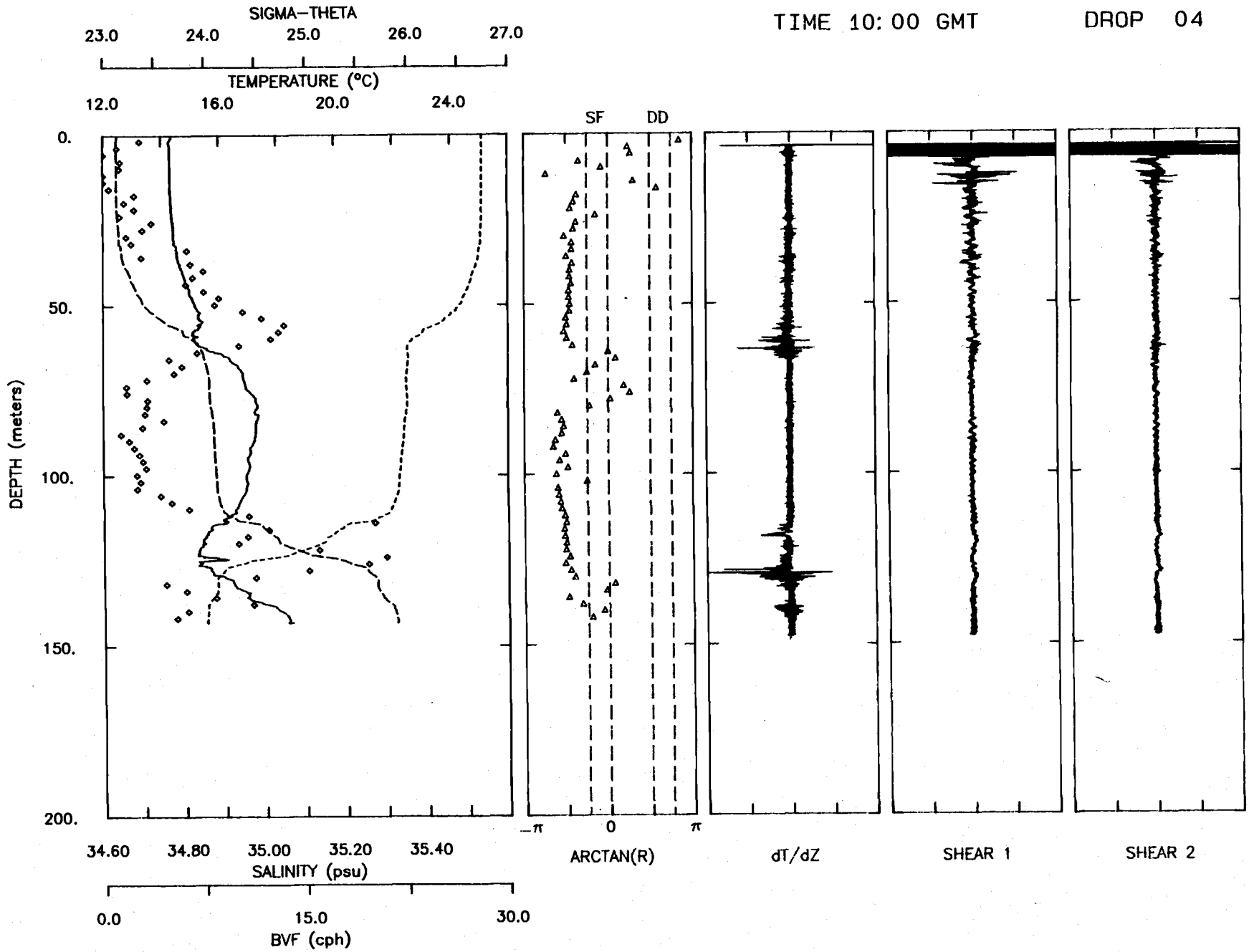
TIME 08:57 GMT

DROP 22



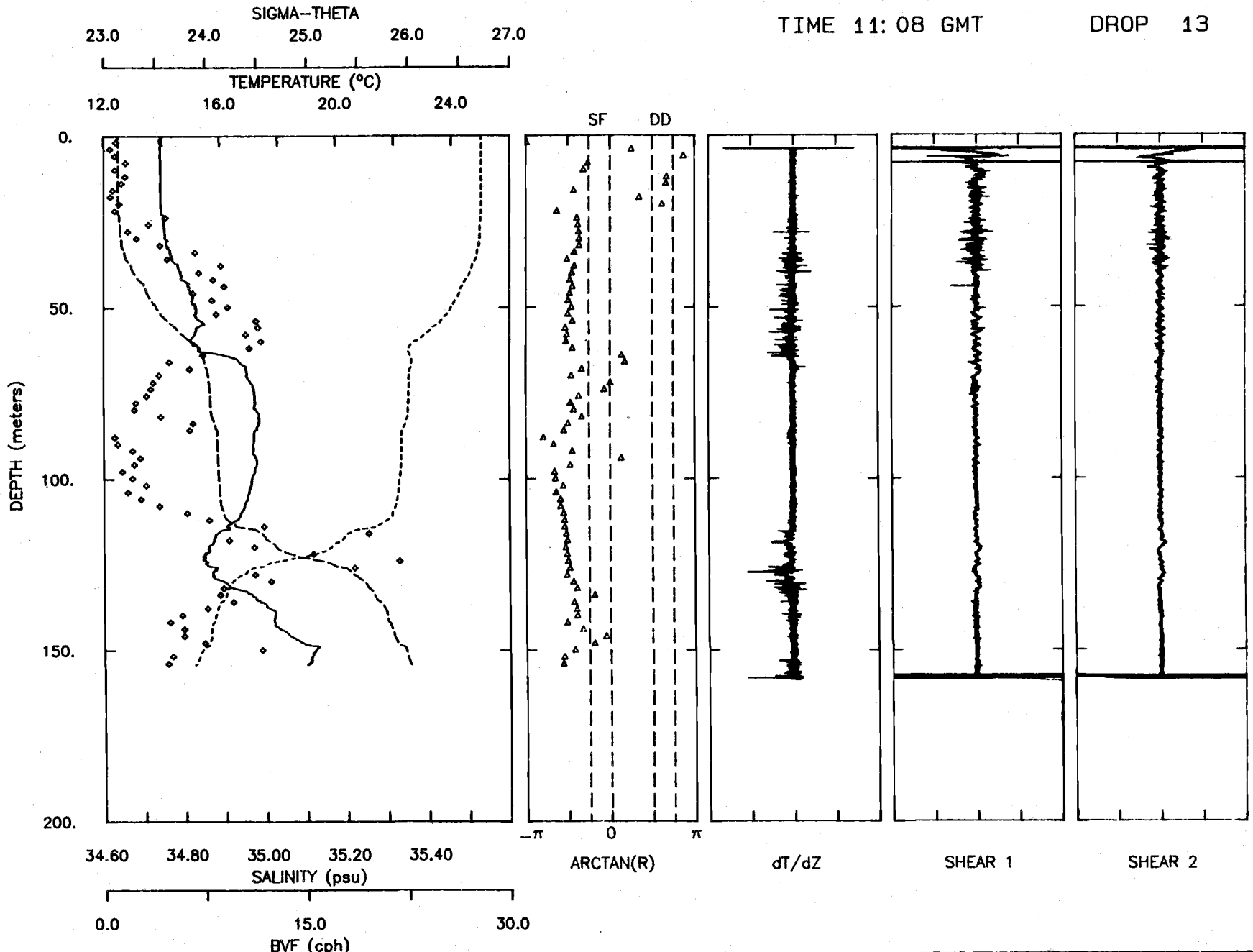
DATE 11/16/84
TIME 10:00 GMT

TAPE 38
DROP 04



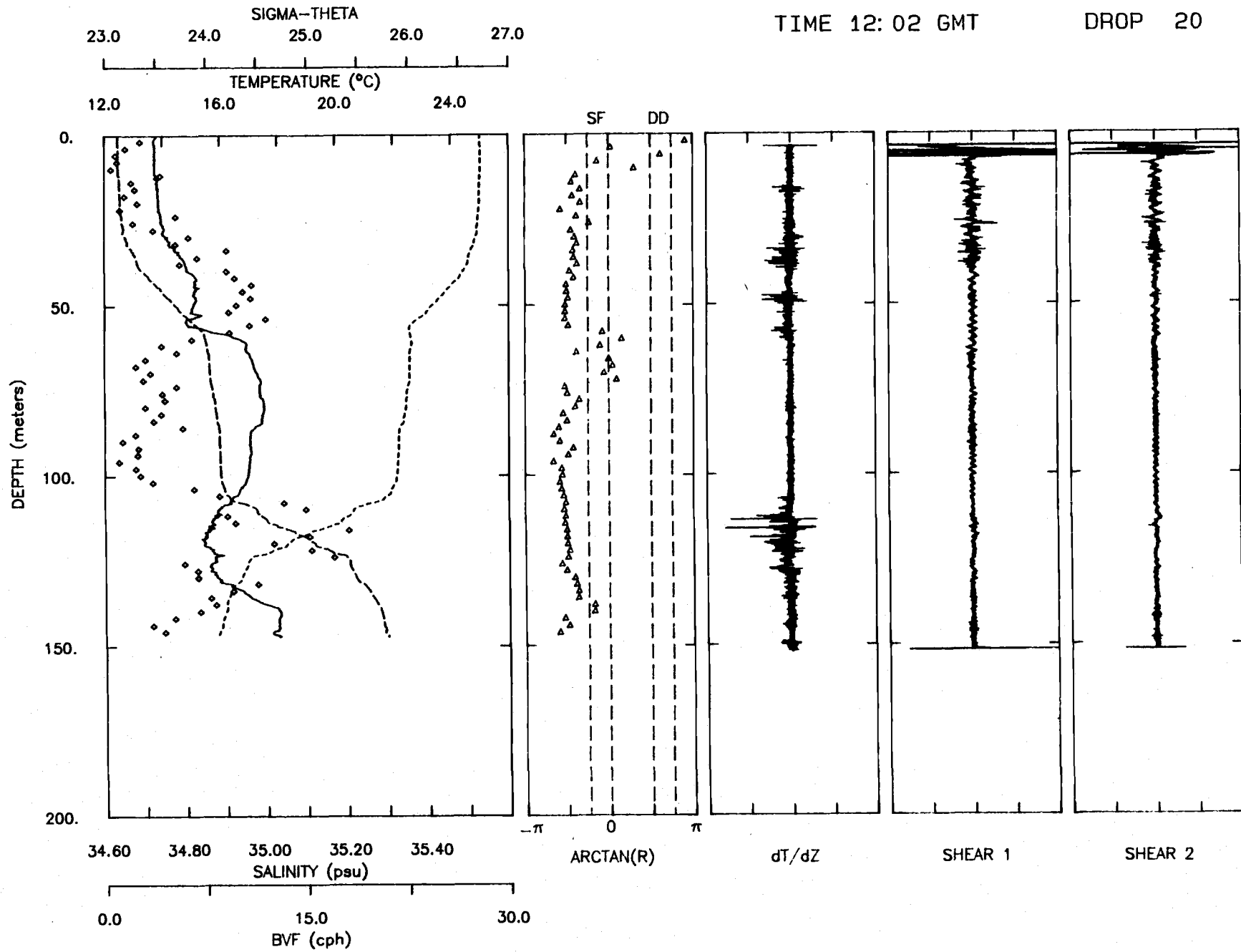
DATE 11/16/84
TIME 11:08 GMT

TAPE 38
DROP 13



DATE 11/16/84
TIME 12:02 GMT

TAPE 38
DROP 20

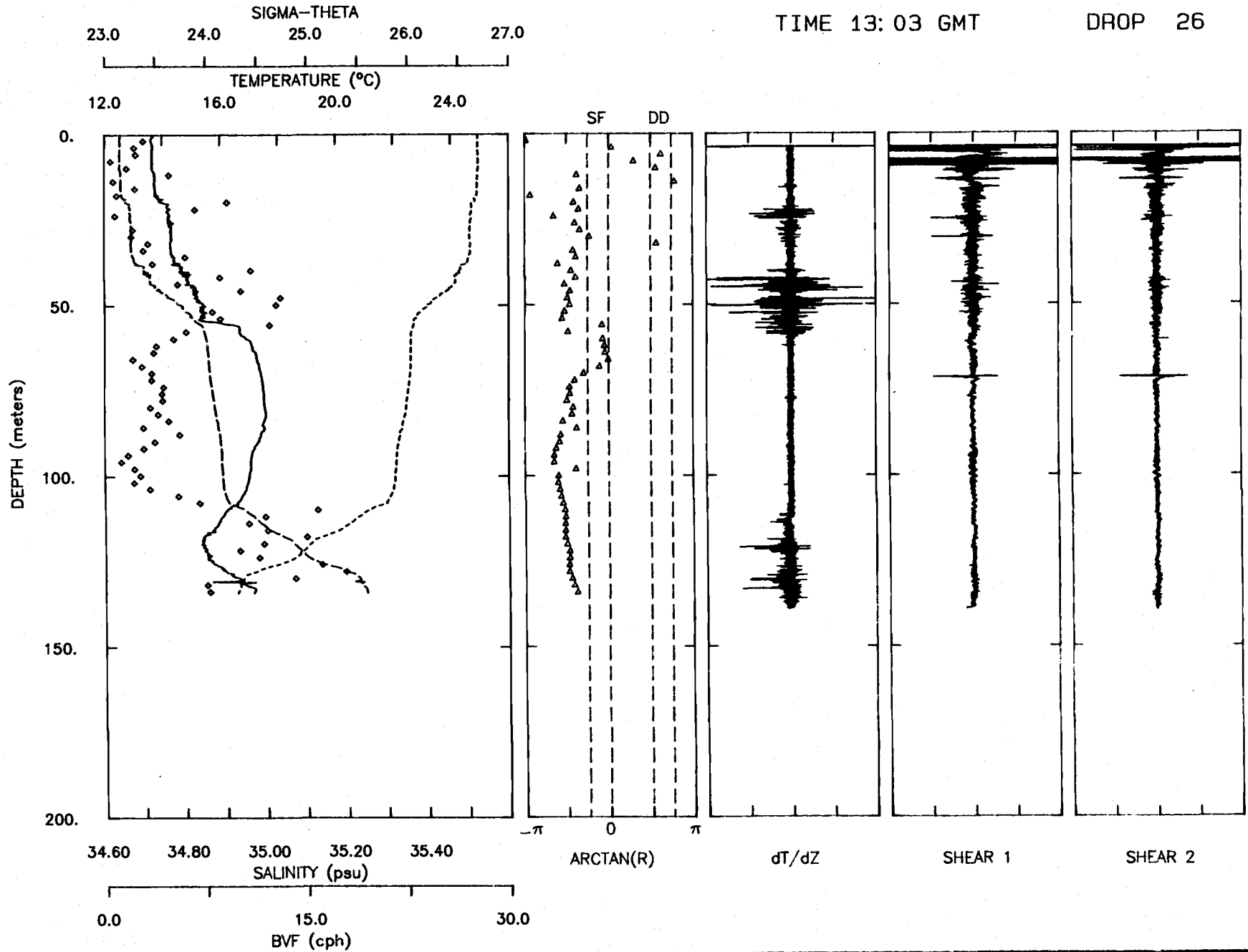


DATE 11/16/84

TAPE 38

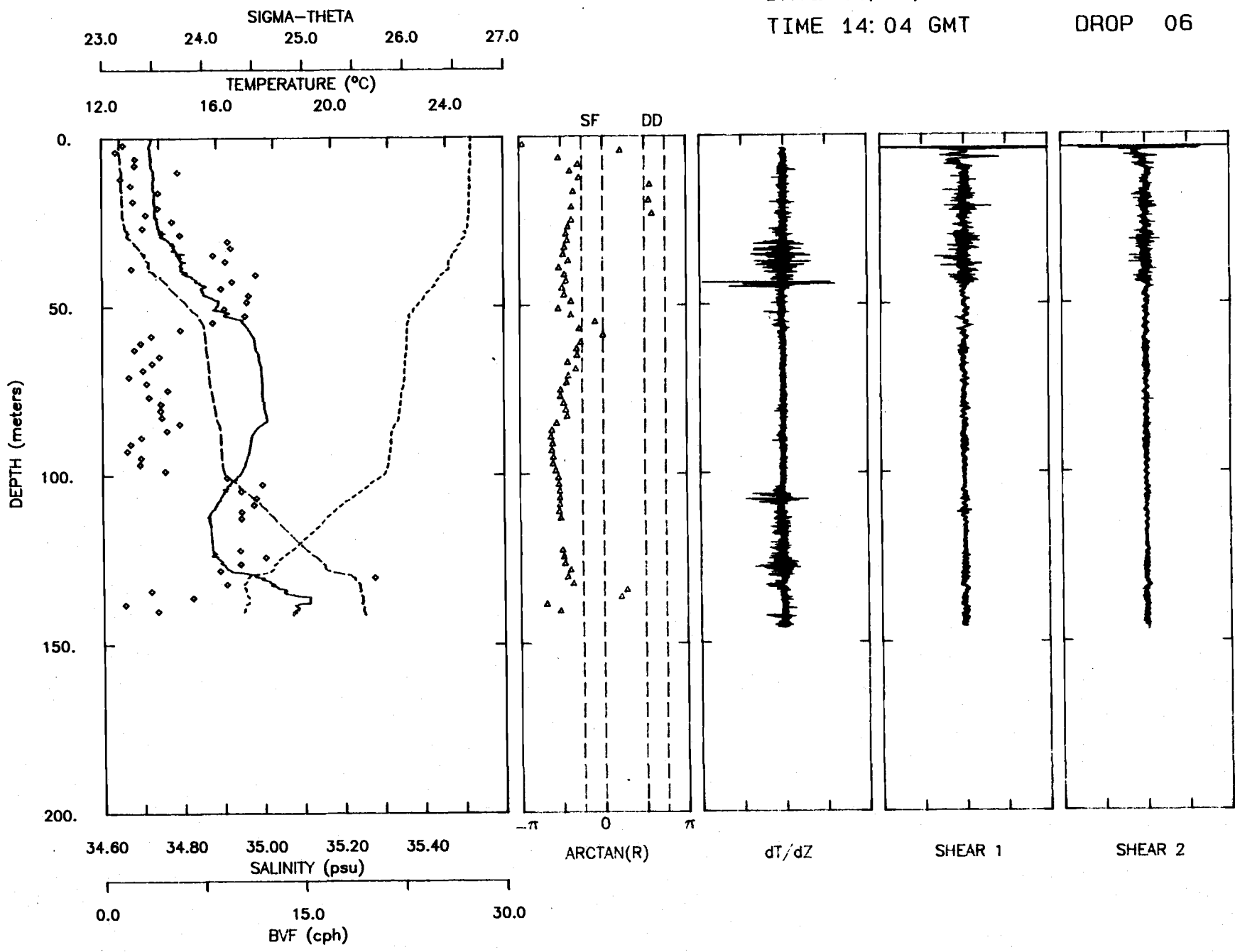
TIME 13:03 GMT

DROP 26



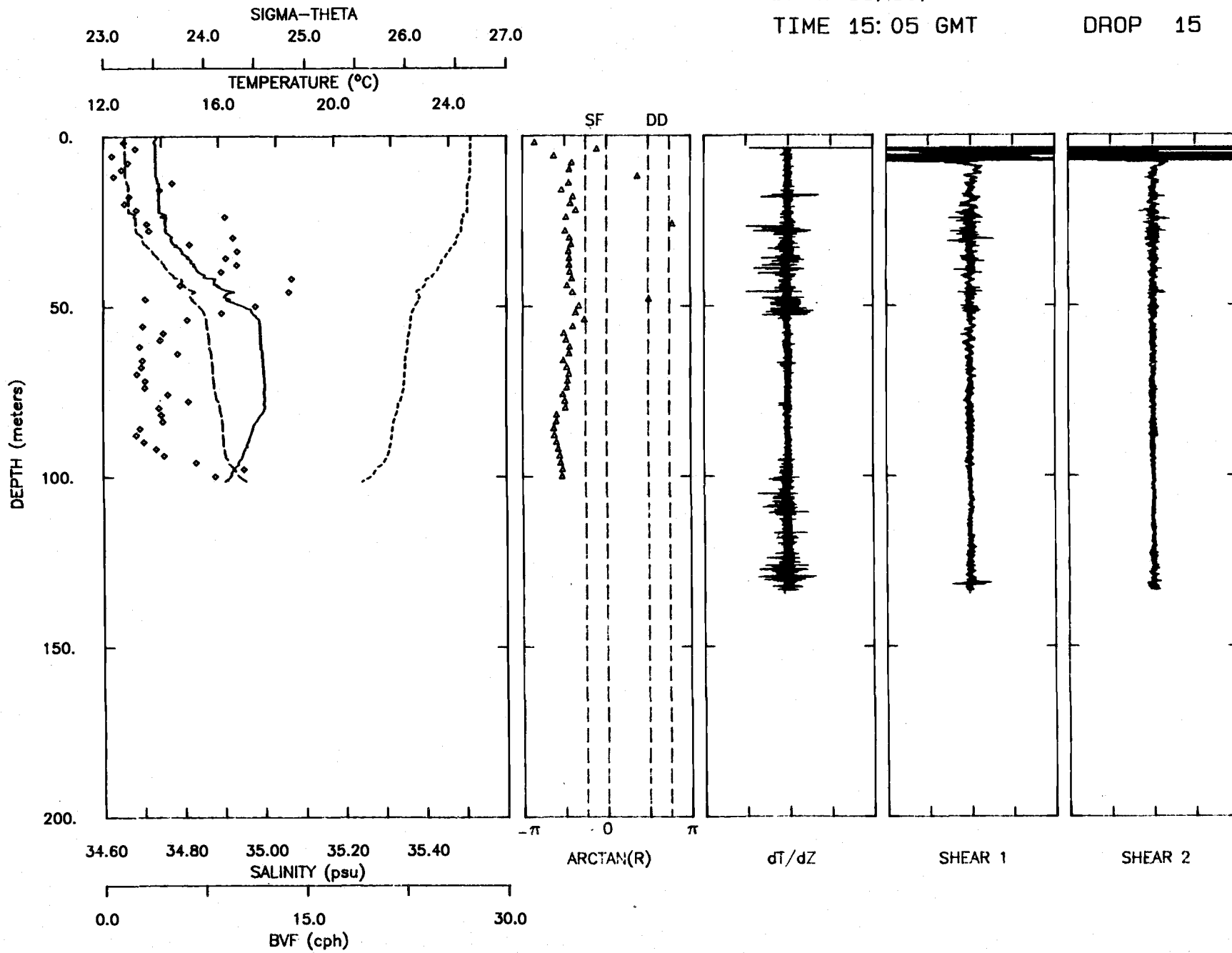
DATE 11/16/84
TIME 14:04 GMT

TAPE 40
DROP 06



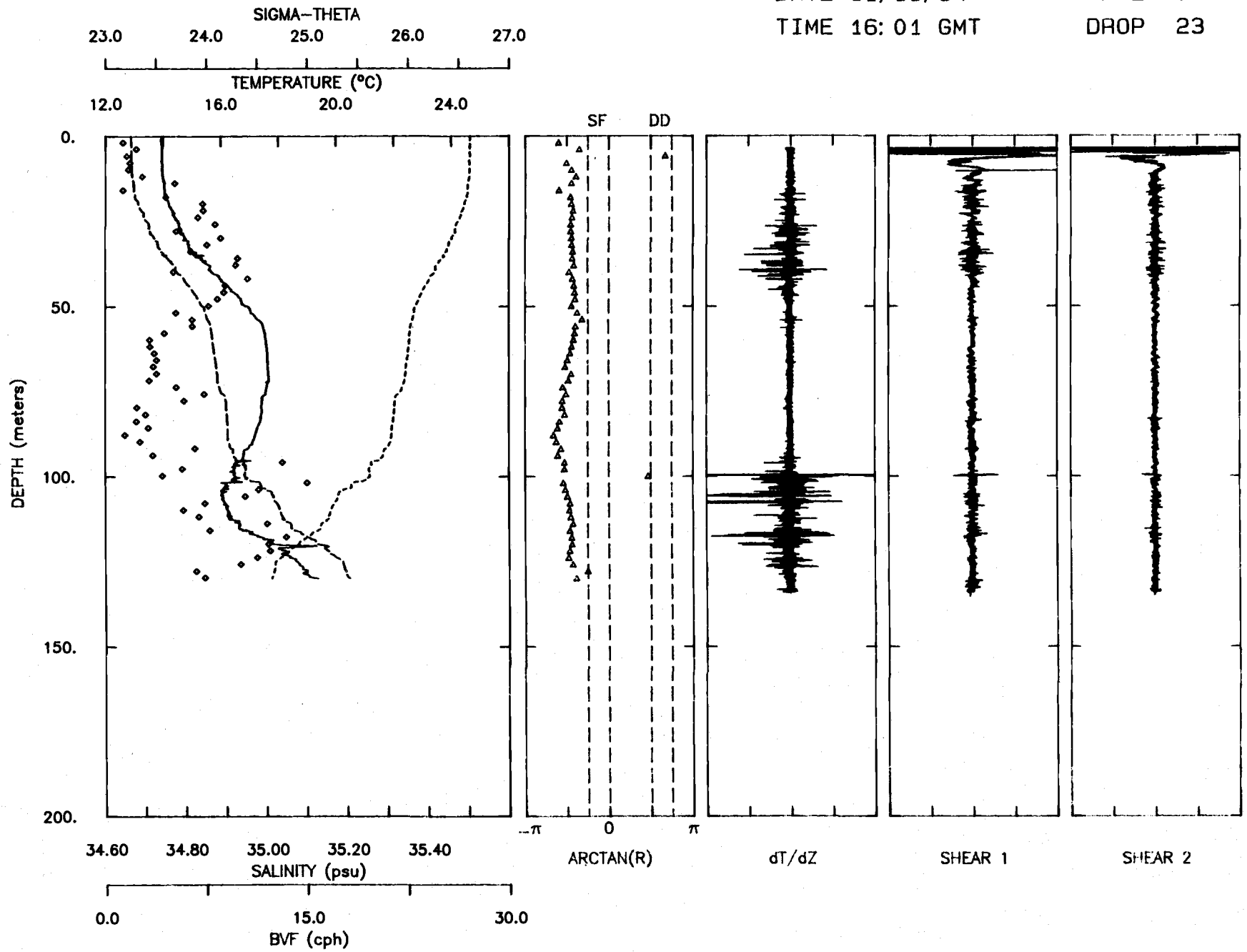
DATE 11/16/84
TIME 15:05 GMT

TAPE 40
DROP 15



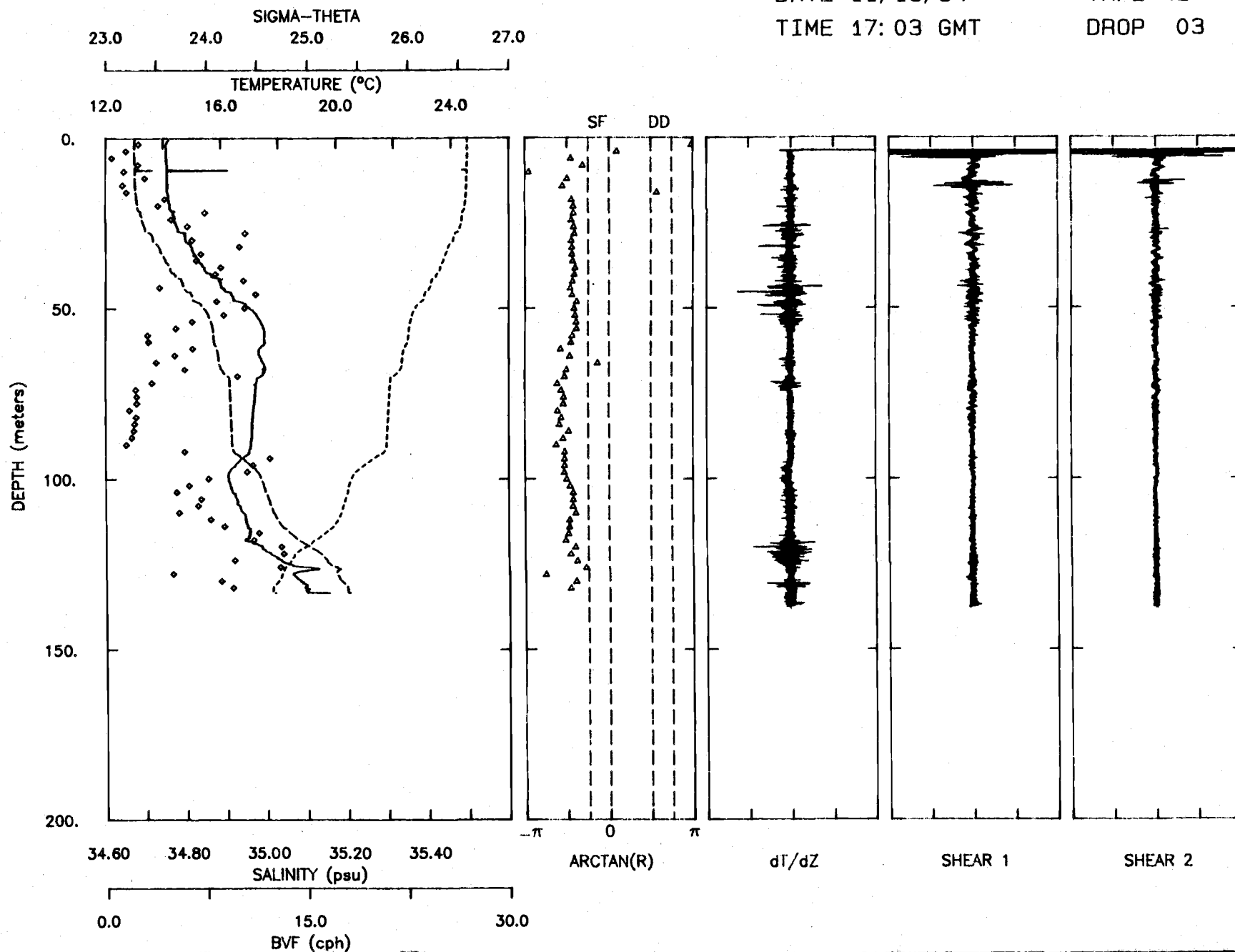
DATE 11/16/84
TIME 16:01 GMT

TAPE 40
DROP 23



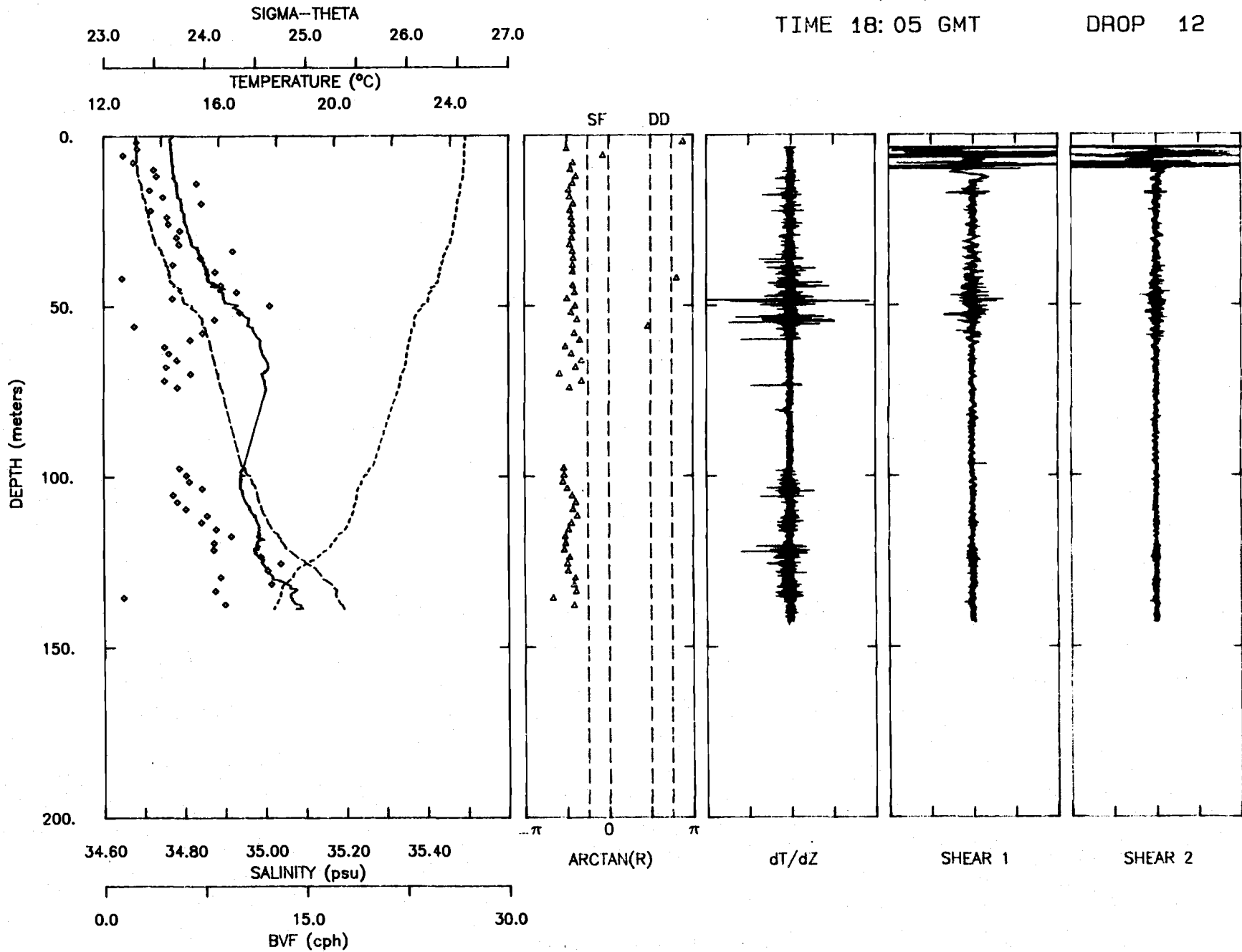
DATE 11/16/84
TIME 17:03 GMT

TAPE 42
DROP 03



DATE 11/16/84
TIME 18:05 GMT

TAPE 42
DROP 12

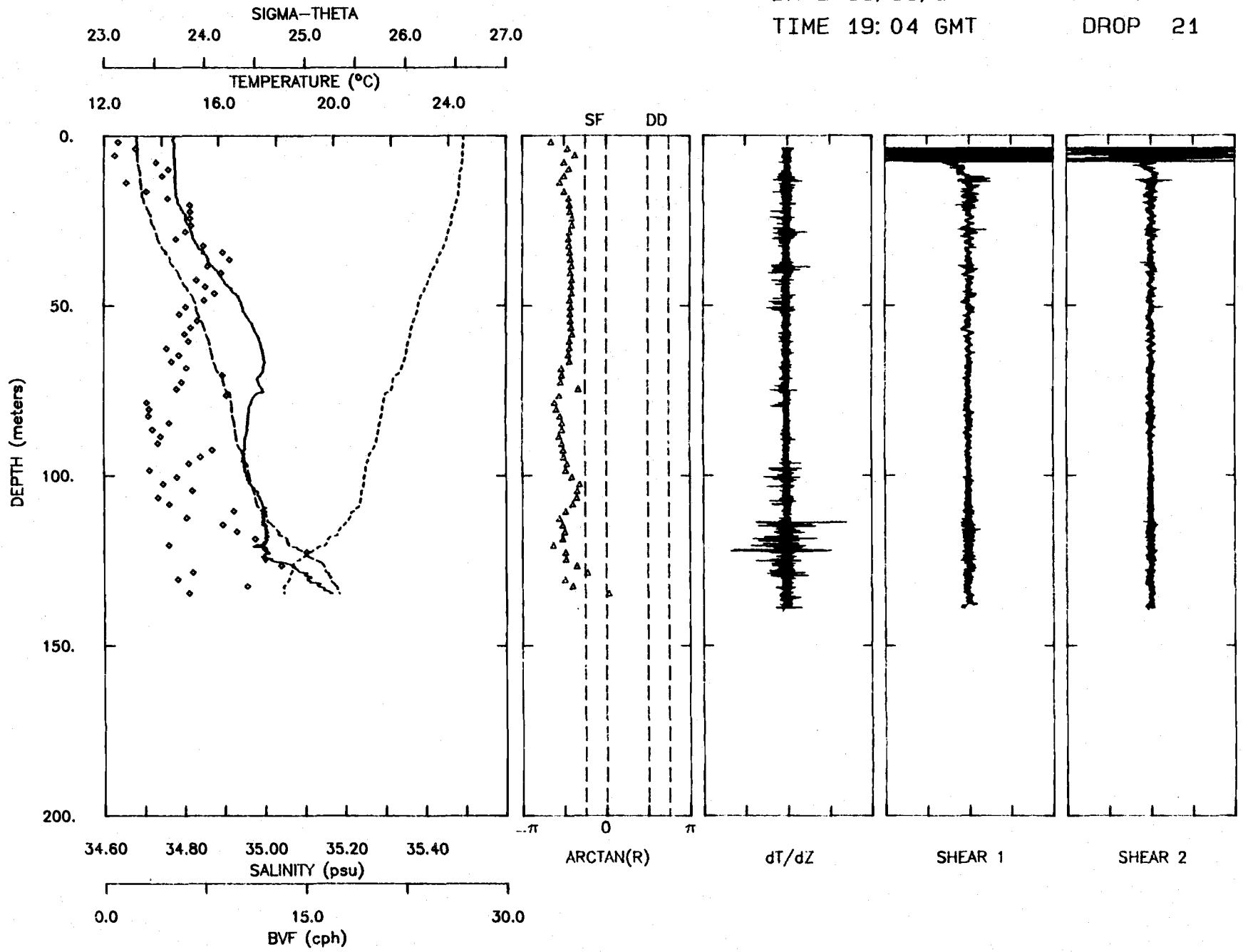


DATE 11/16/84

TAPE 42

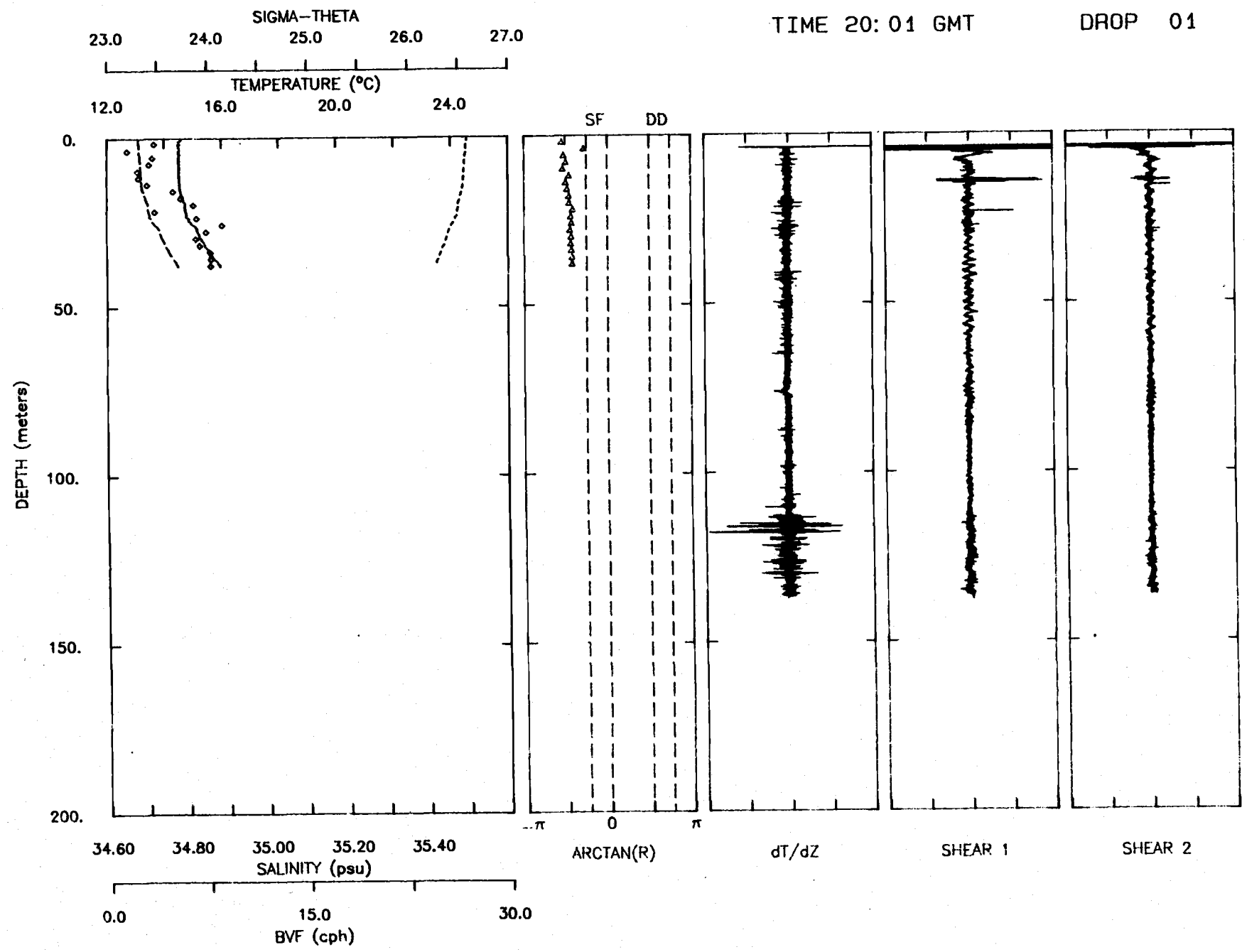
TIME 19:04 GMT

DROP 21



DATE 11/16/84
TIME 20:01 GMT

TAPE 44
DROP 01

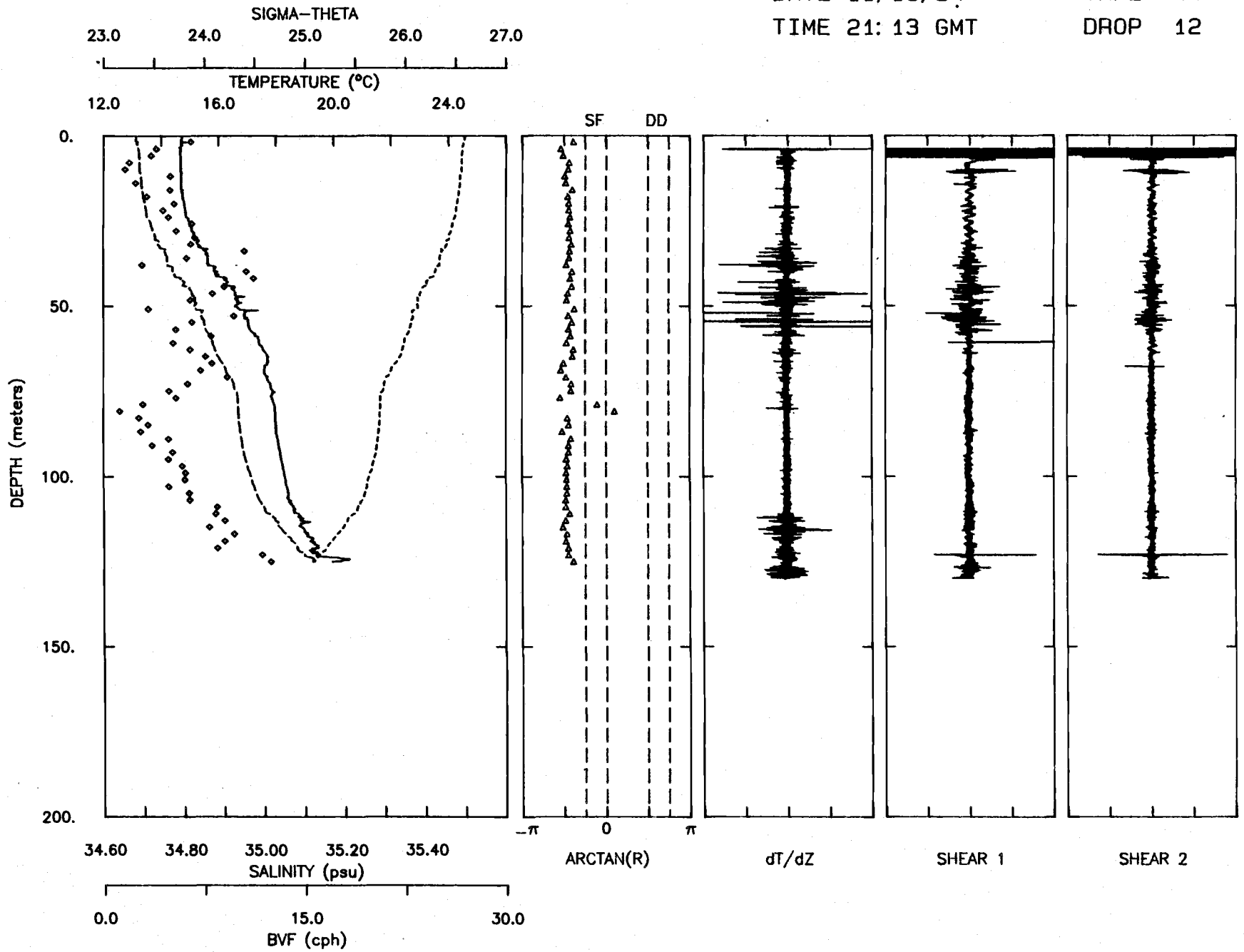


DATE 11/16/84

TAPE 44

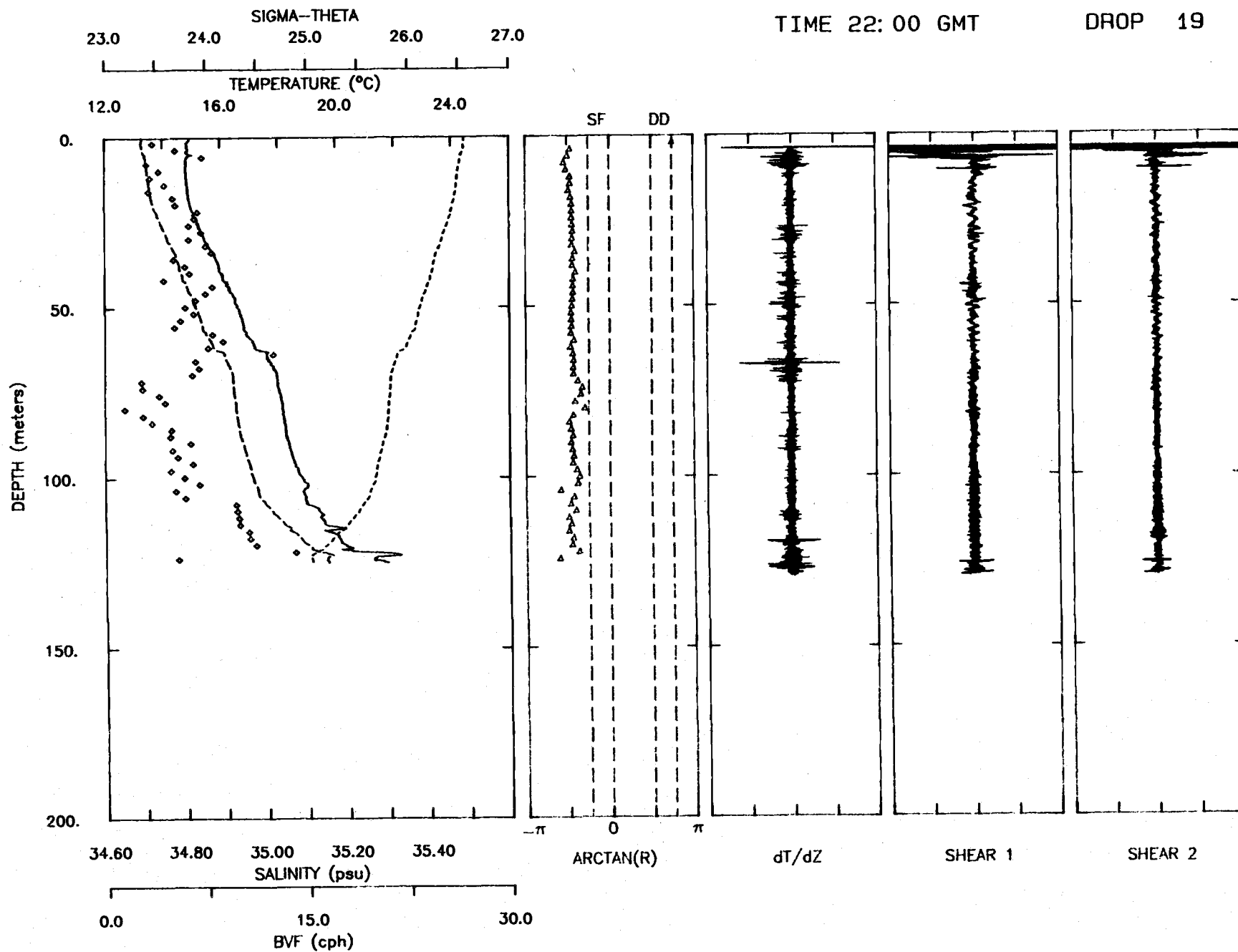
TIME 21:13 GMT

DROP 12



DATE 11/16/84
TIME 22:00 GMT

TAPE 44
DROP 19

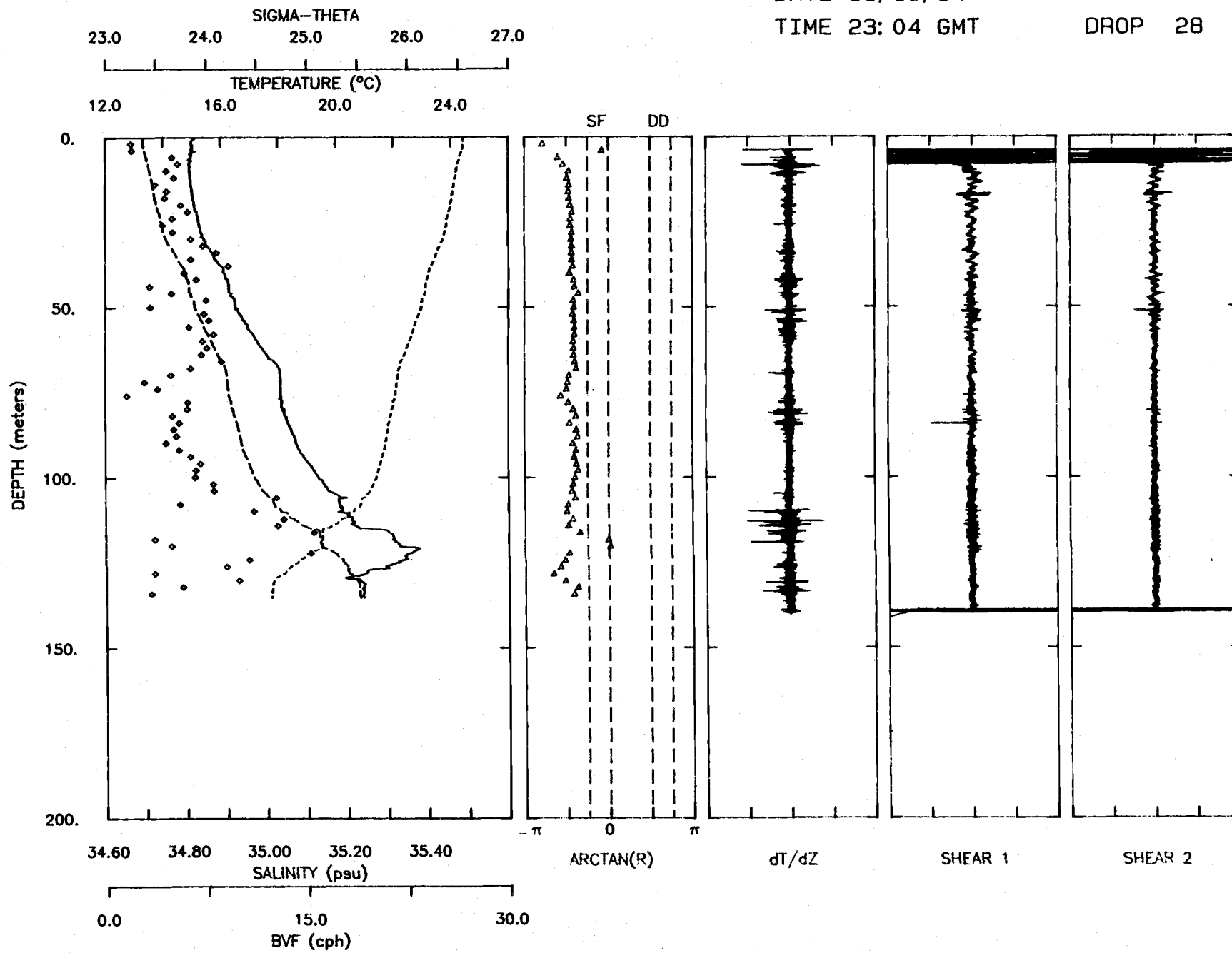


DATE 11/16/84

TAPE 44

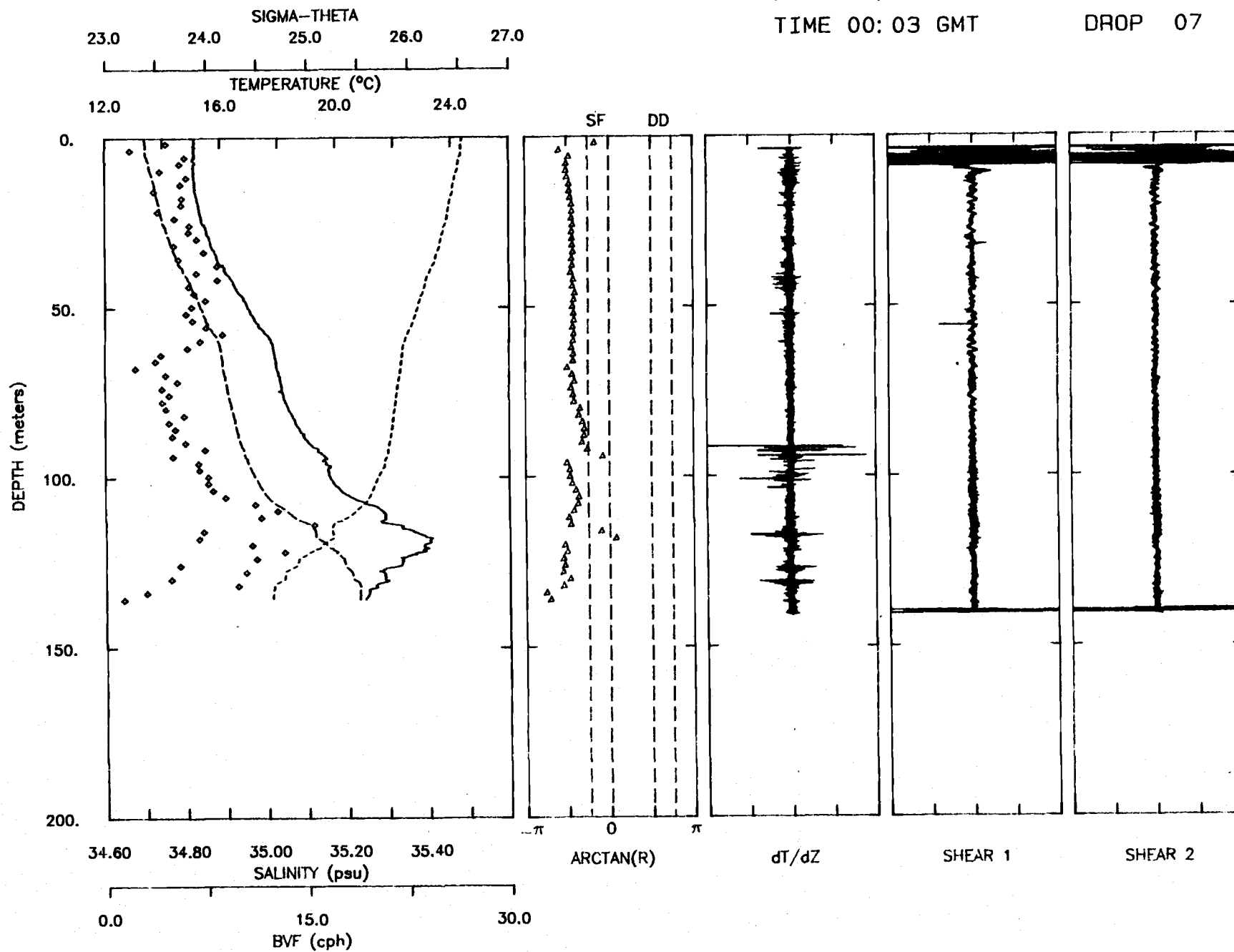
TIME 23:04 GMT

DROP 28



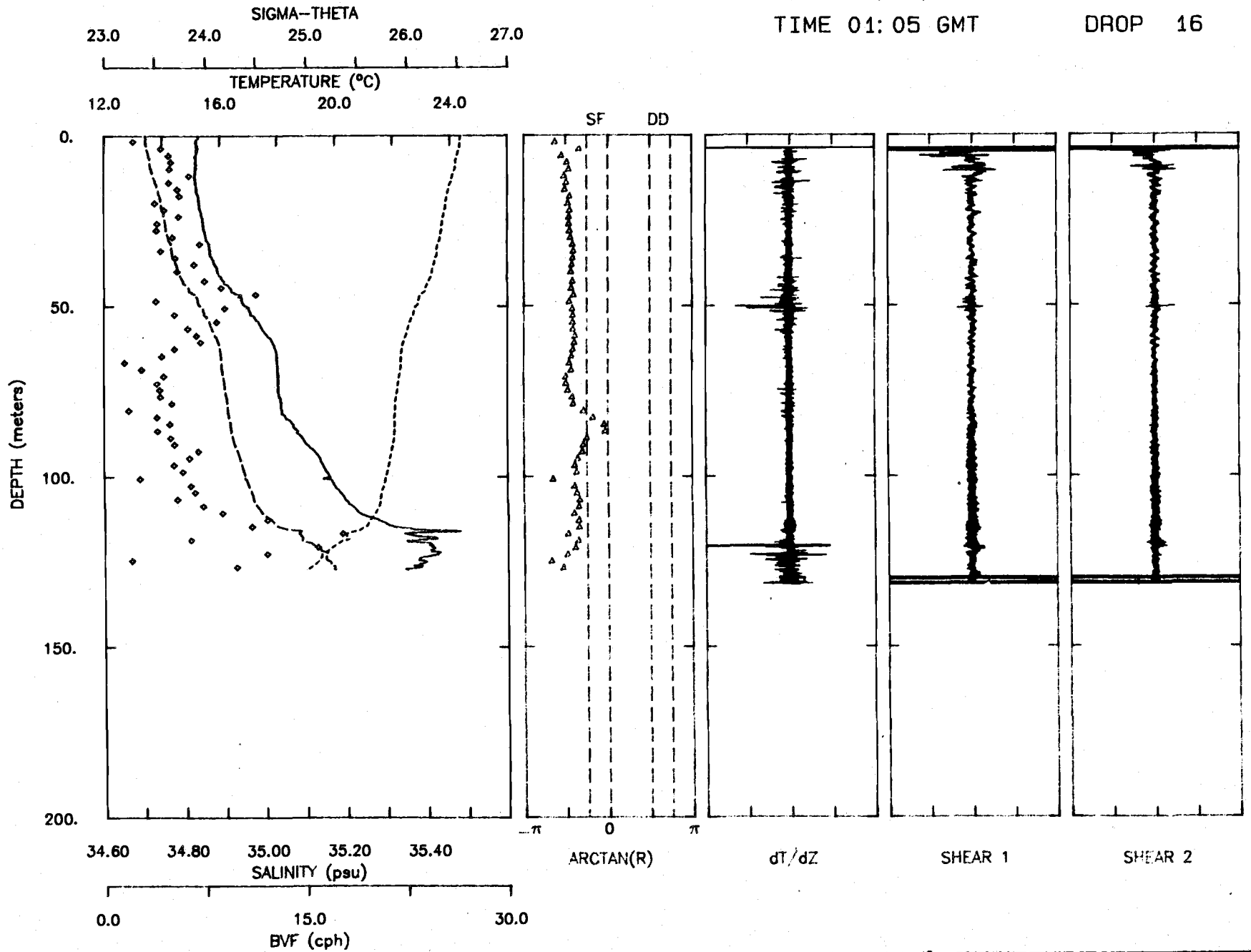
DATE 11/17/84
TIME 00:03 GMT

TAPE 46
DROP 07



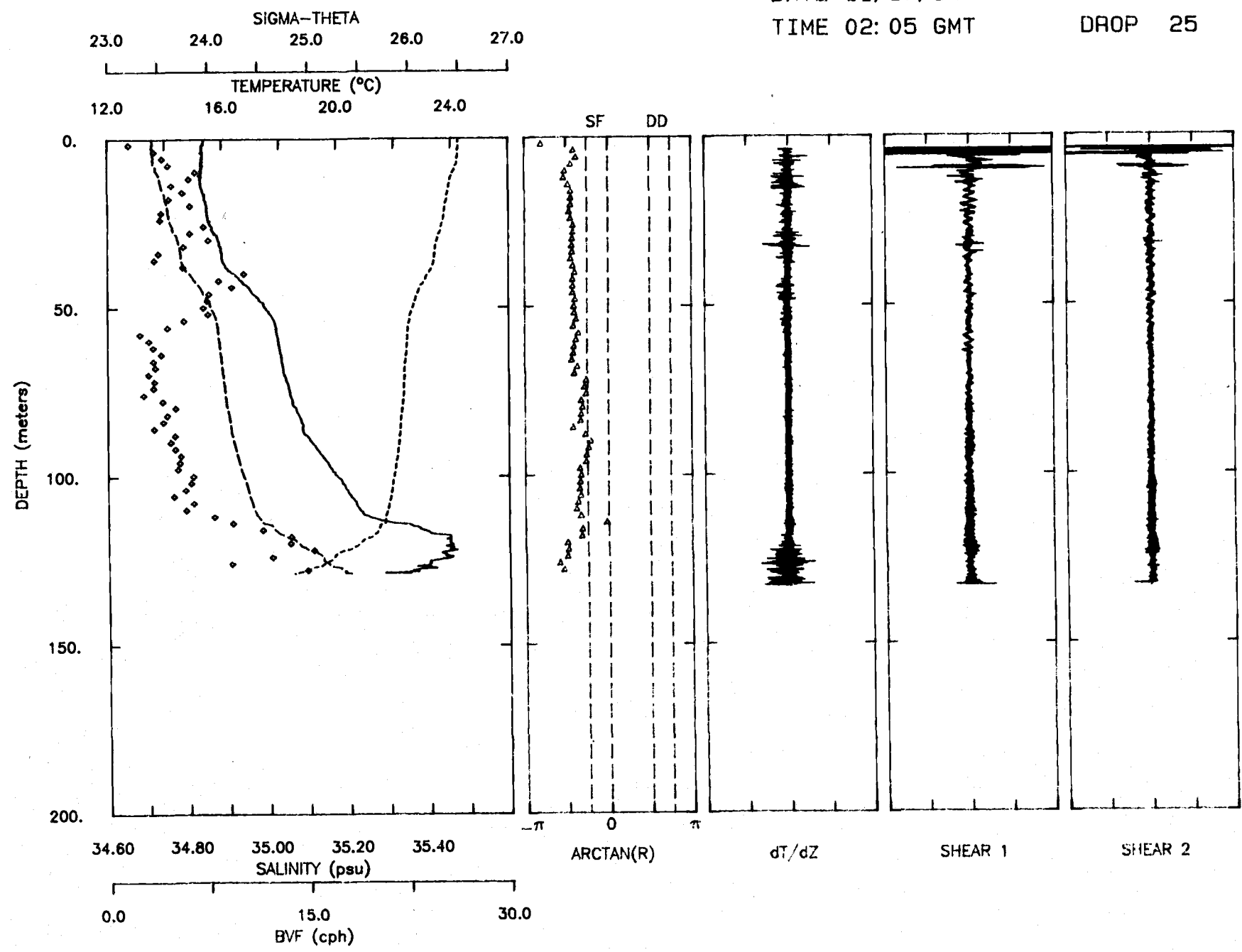
DATE 11/17/84
TIME 01:05 GMT

TAPE 46
DROP 16



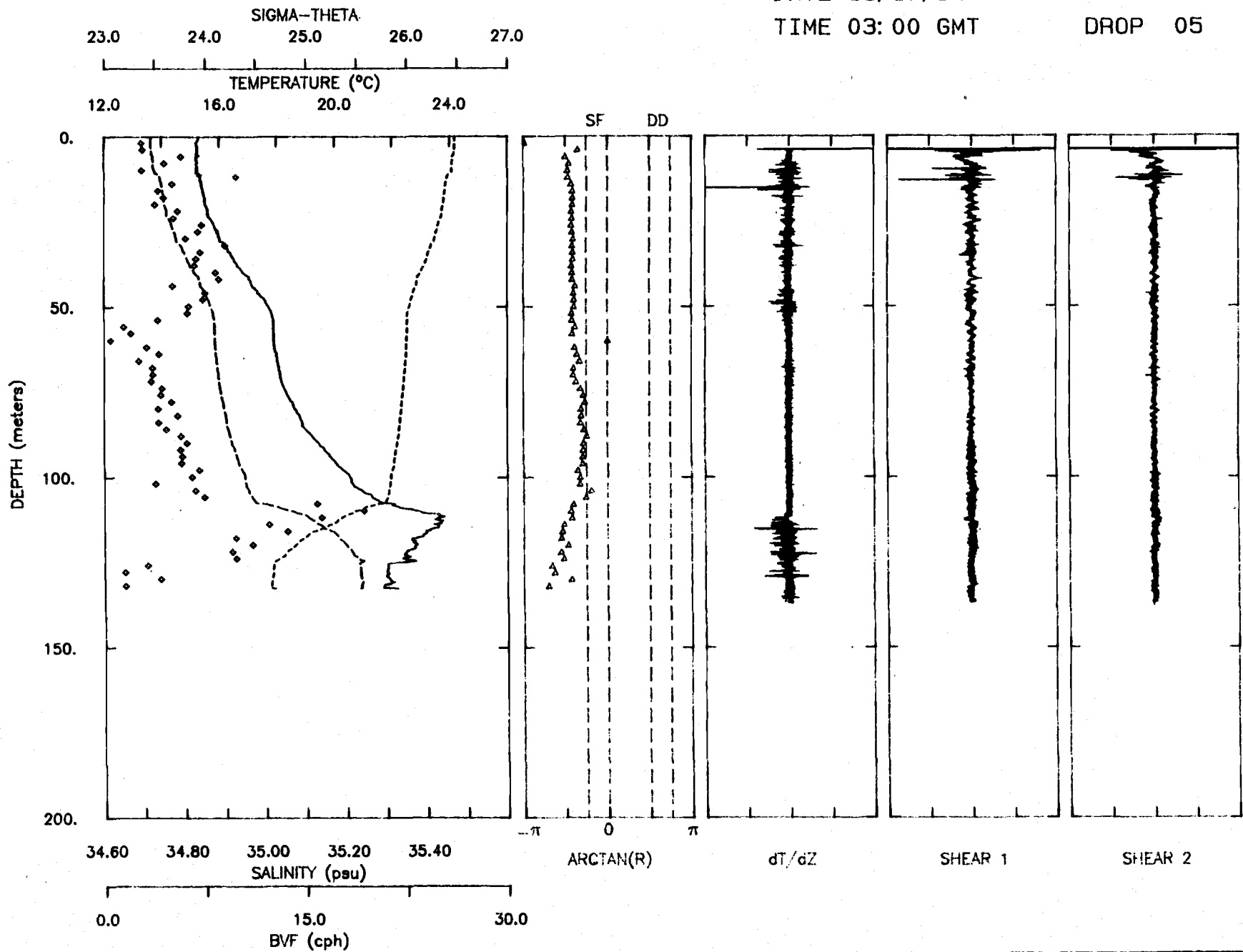
DATE 11/17/84
TIME 02:05 GMT

TAPE 46
DROP 25



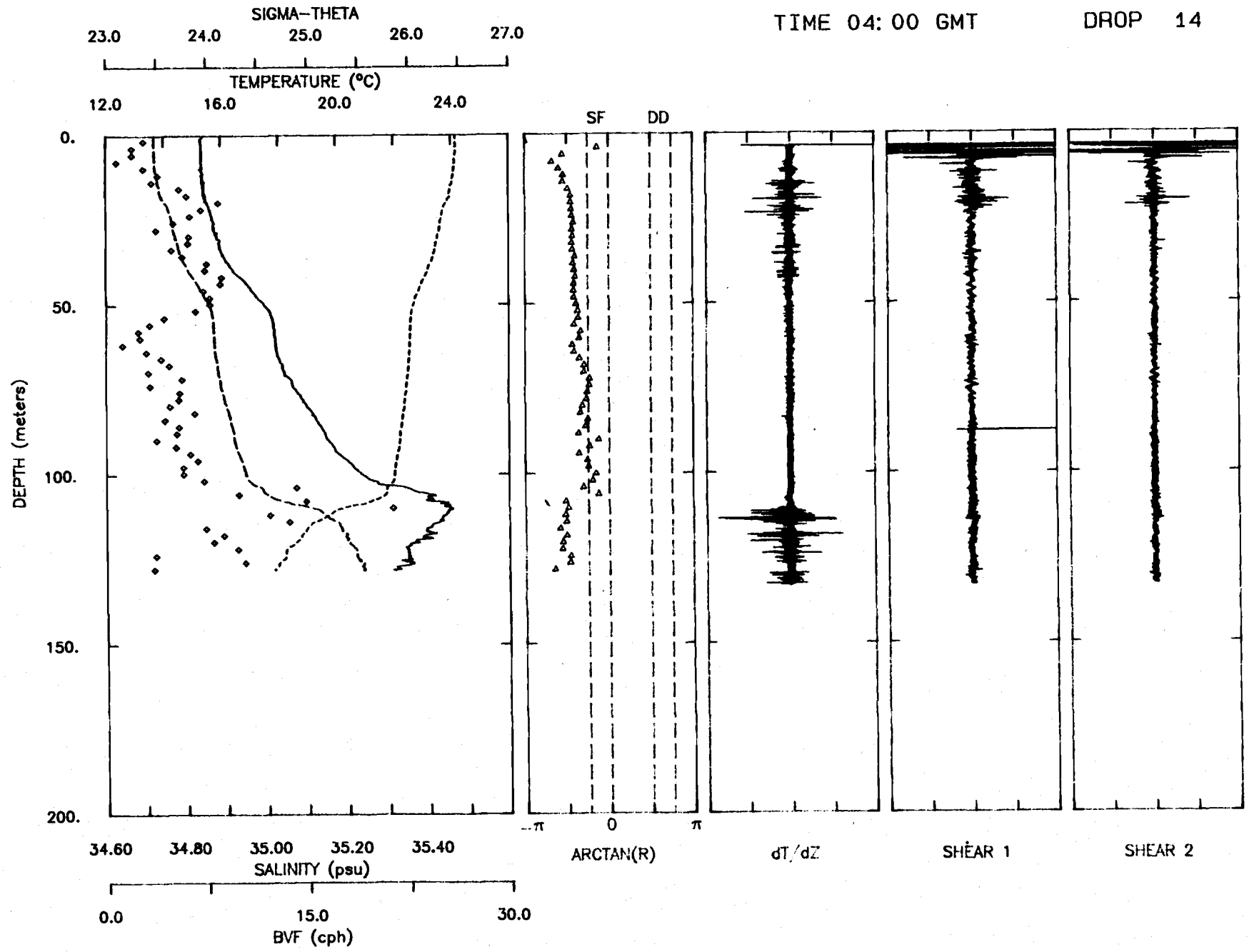
DATE 11/17/84
TIME 03:00 GMT

TAPE 49
DROP 05



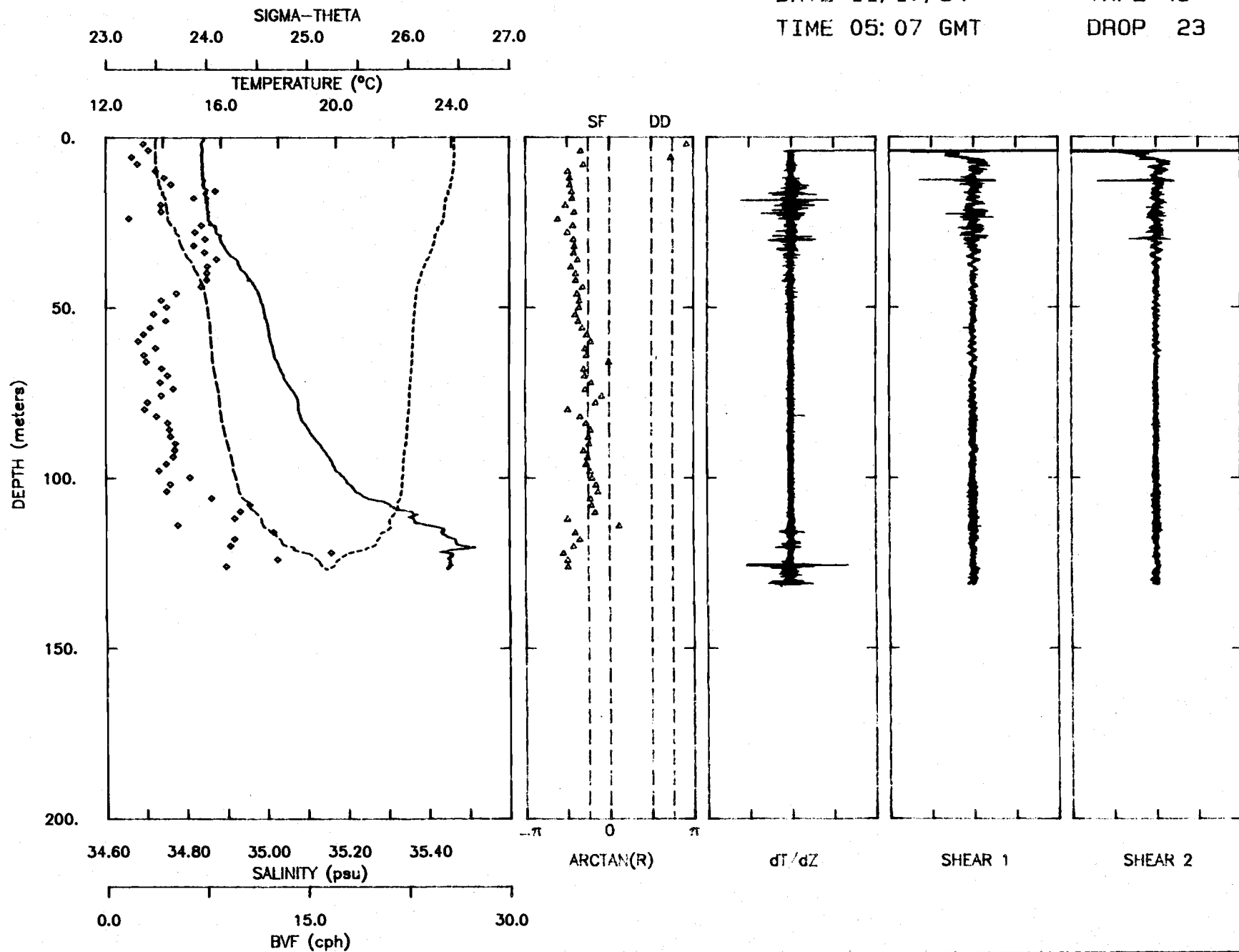
DATE 11/17/84
TIME 04:00 GMT

TAPE 49
DROP 14



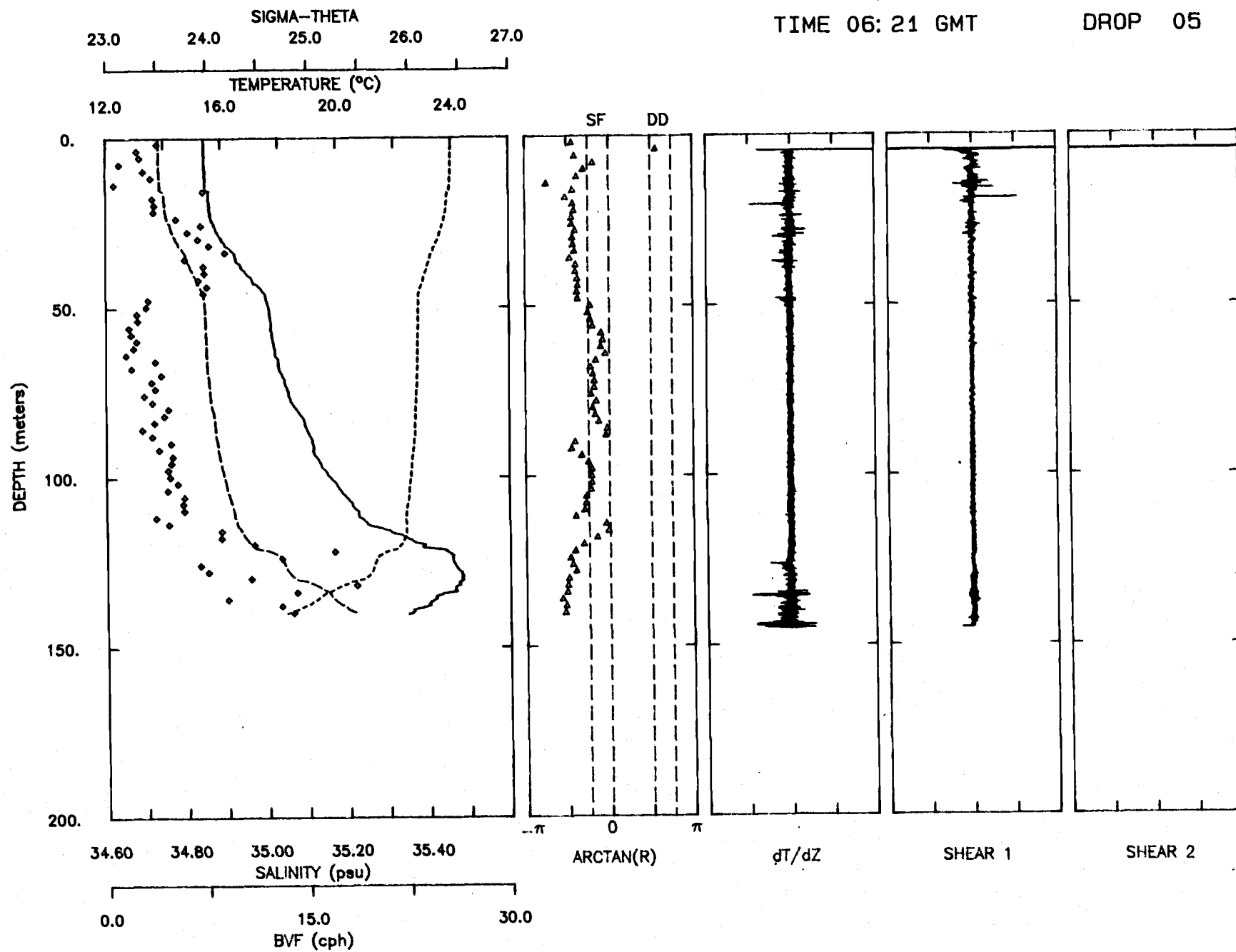
DATE 11/17/84
TIME 05:07 GMT

TAPE 49
DROP 23



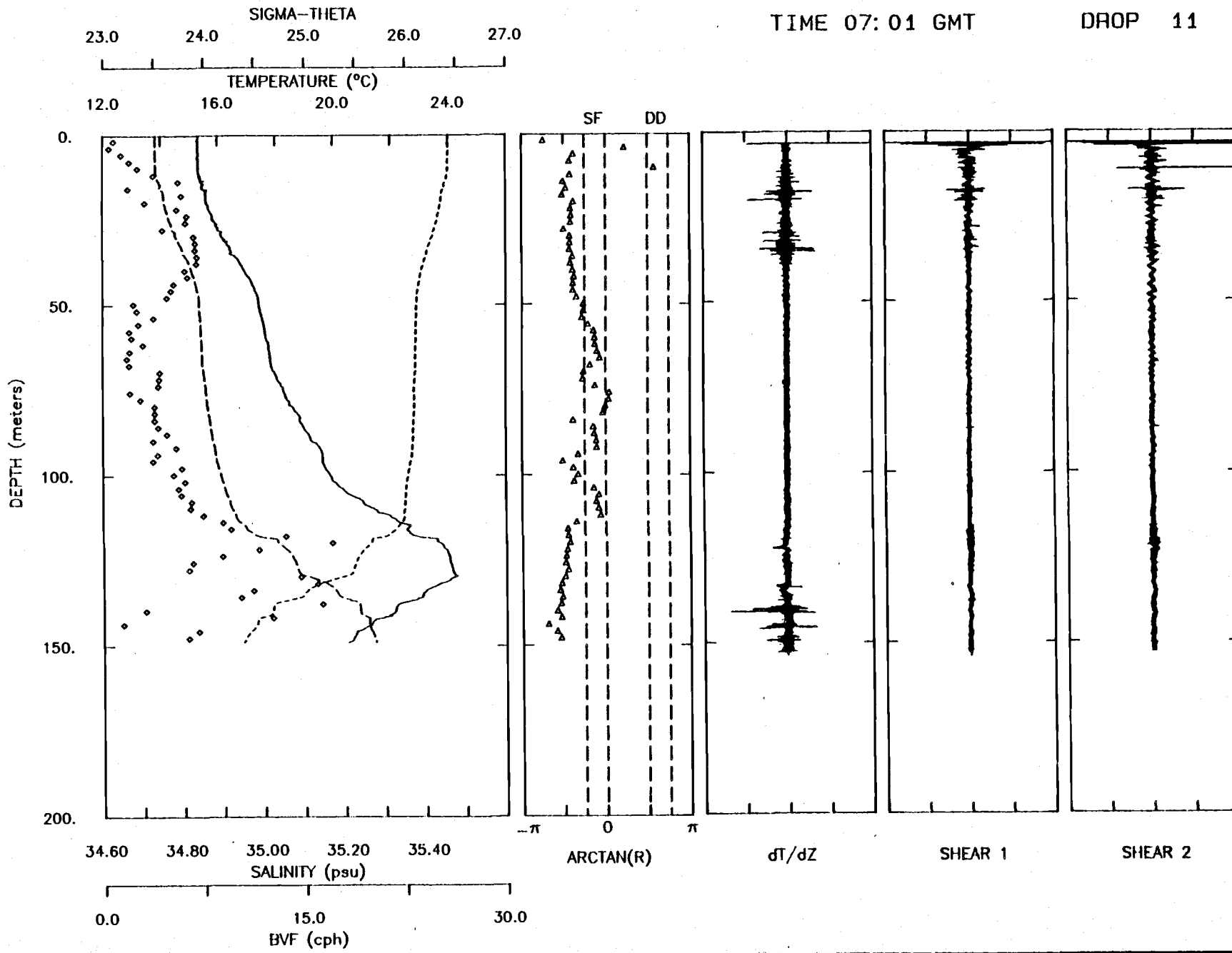
DATE 11/17/84
TIME 06:21 GMT

TAPE 53
DROP 05



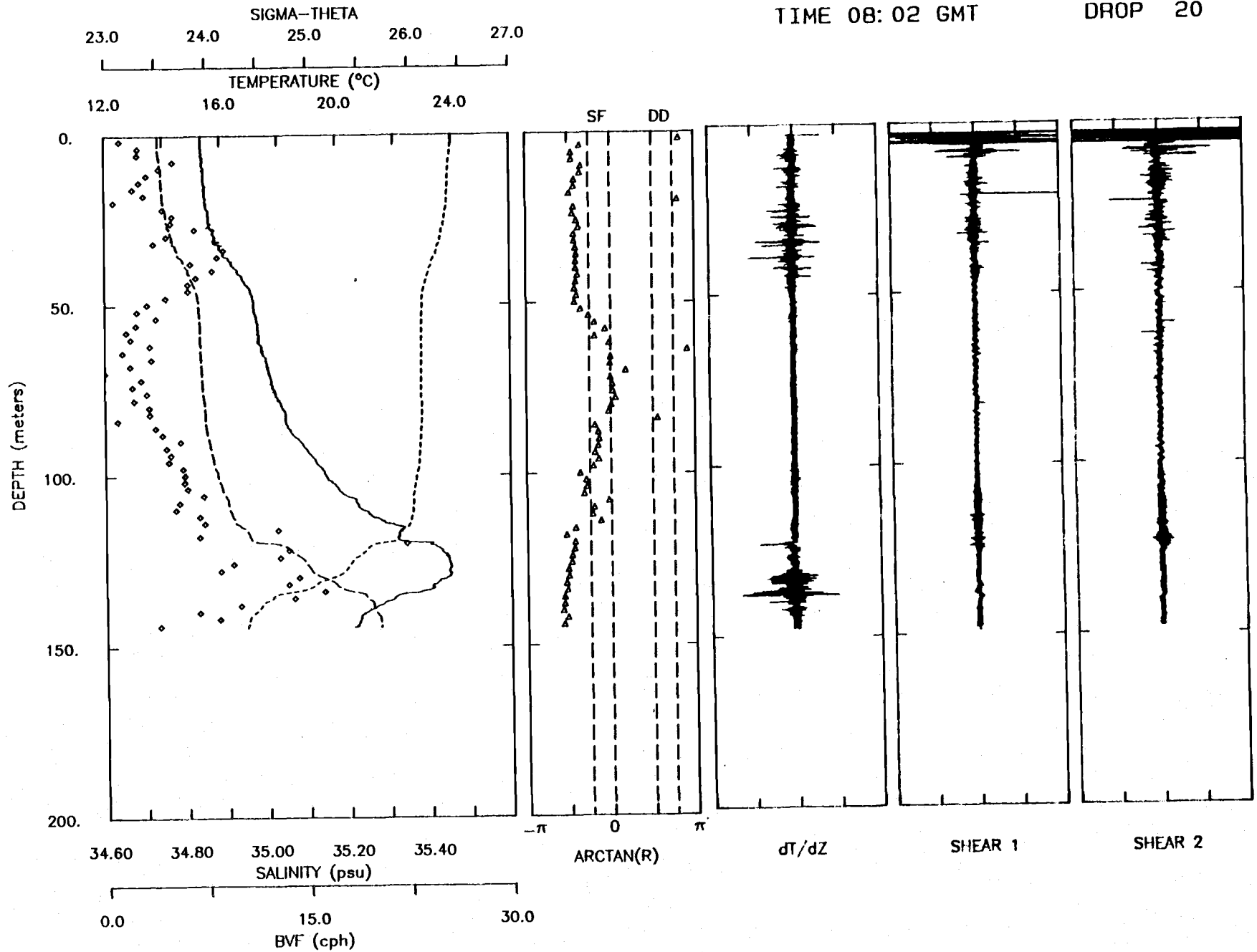
DATE 11/17/84
TIME 07:01 GMT

TAPE 53
DROP 11



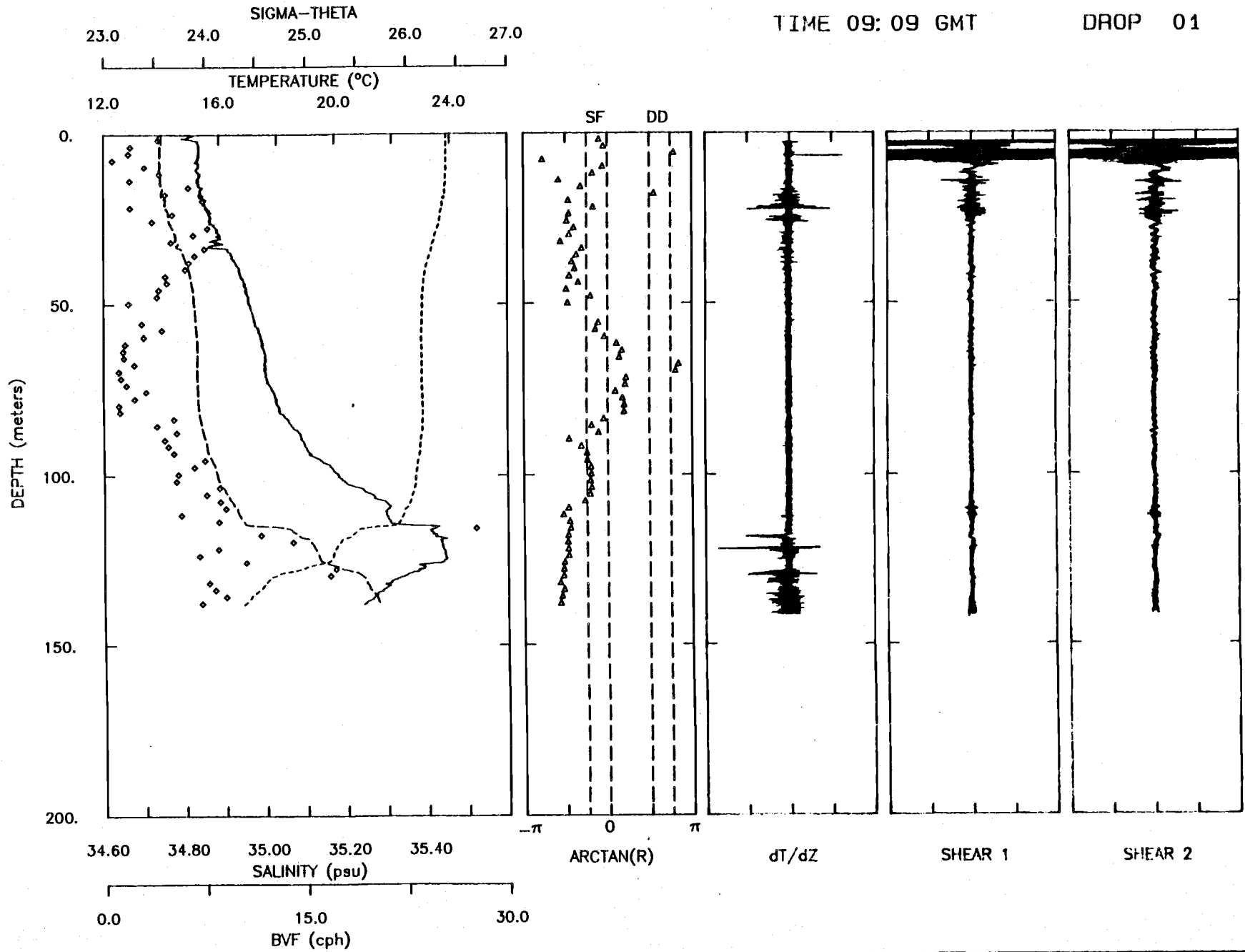
DATE 11/17/84
TIME 08:02 GMT

TAPE 53
DROP 20



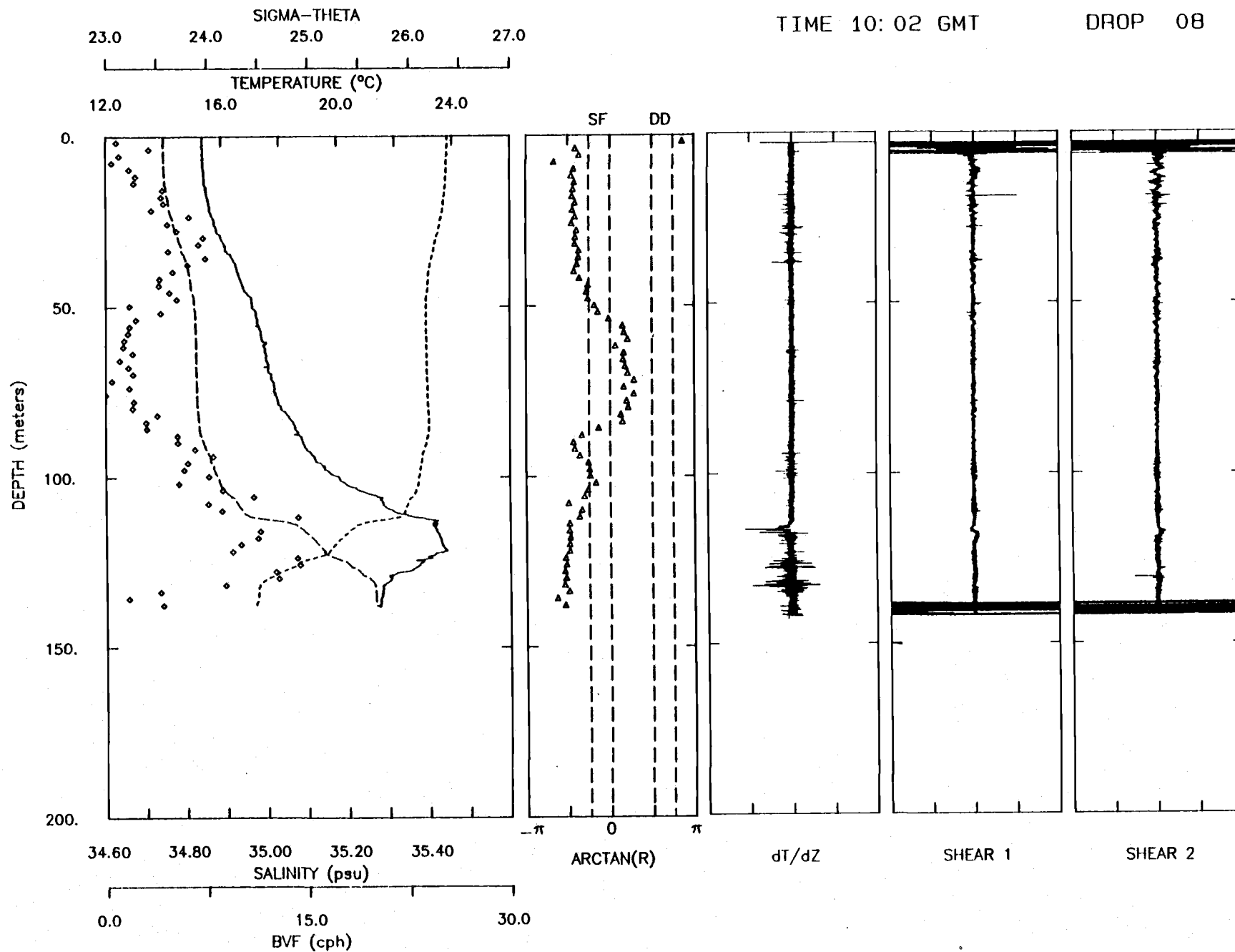
DATE 11/17/84
TIME 09:09 GMT

TAPE 55
DROP 01



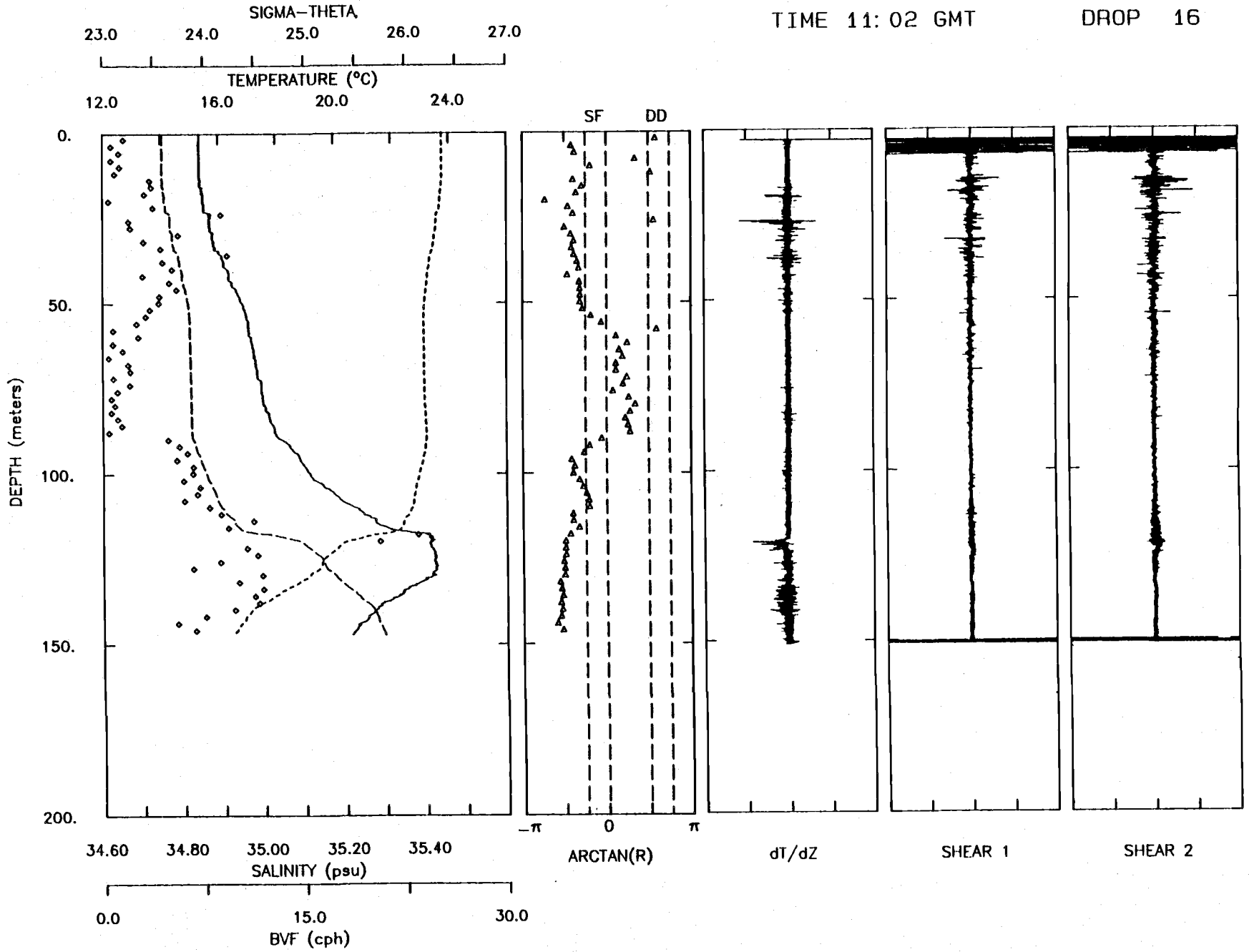
DATE 11/17/84
TIME 10:02 GMT

TAPE 55
DROP 08



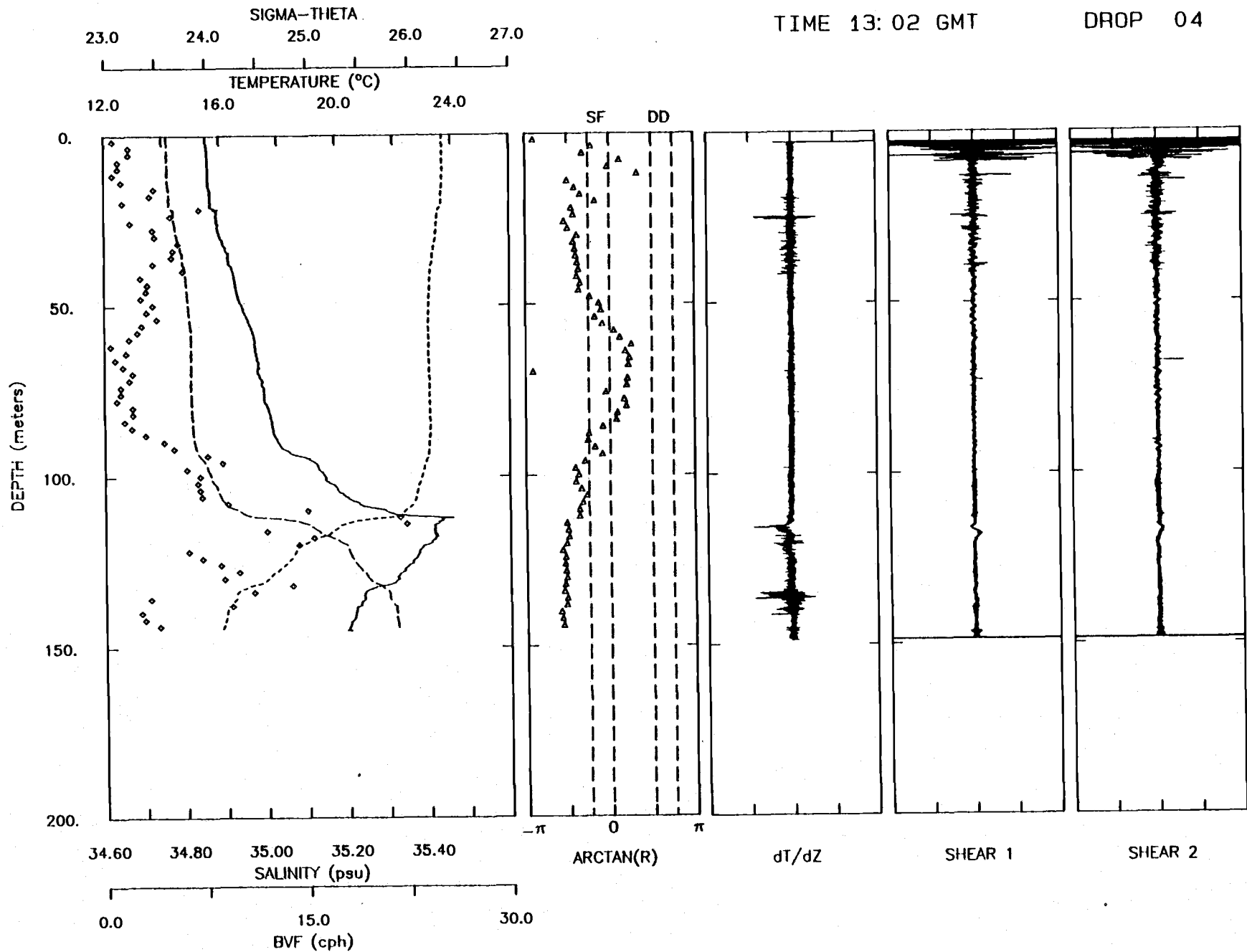
DATE 11/17/84
TIME 11:02 GMT

TAPE 55
DROP 16



DATE 11/17/84
TIME 13:02 GMT

TAPE 57
DROP 04

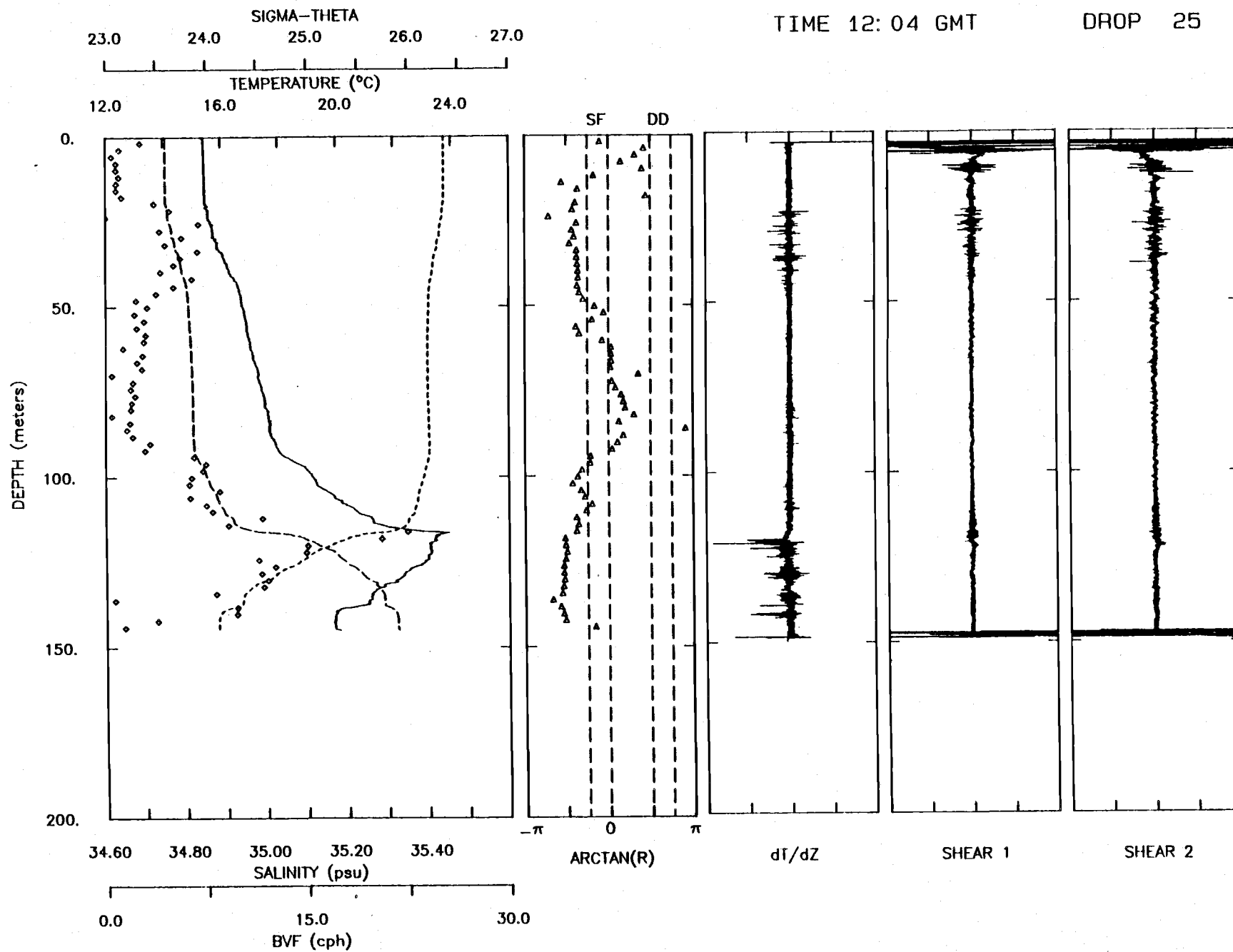


DATE 11/17/84

TAPE 55

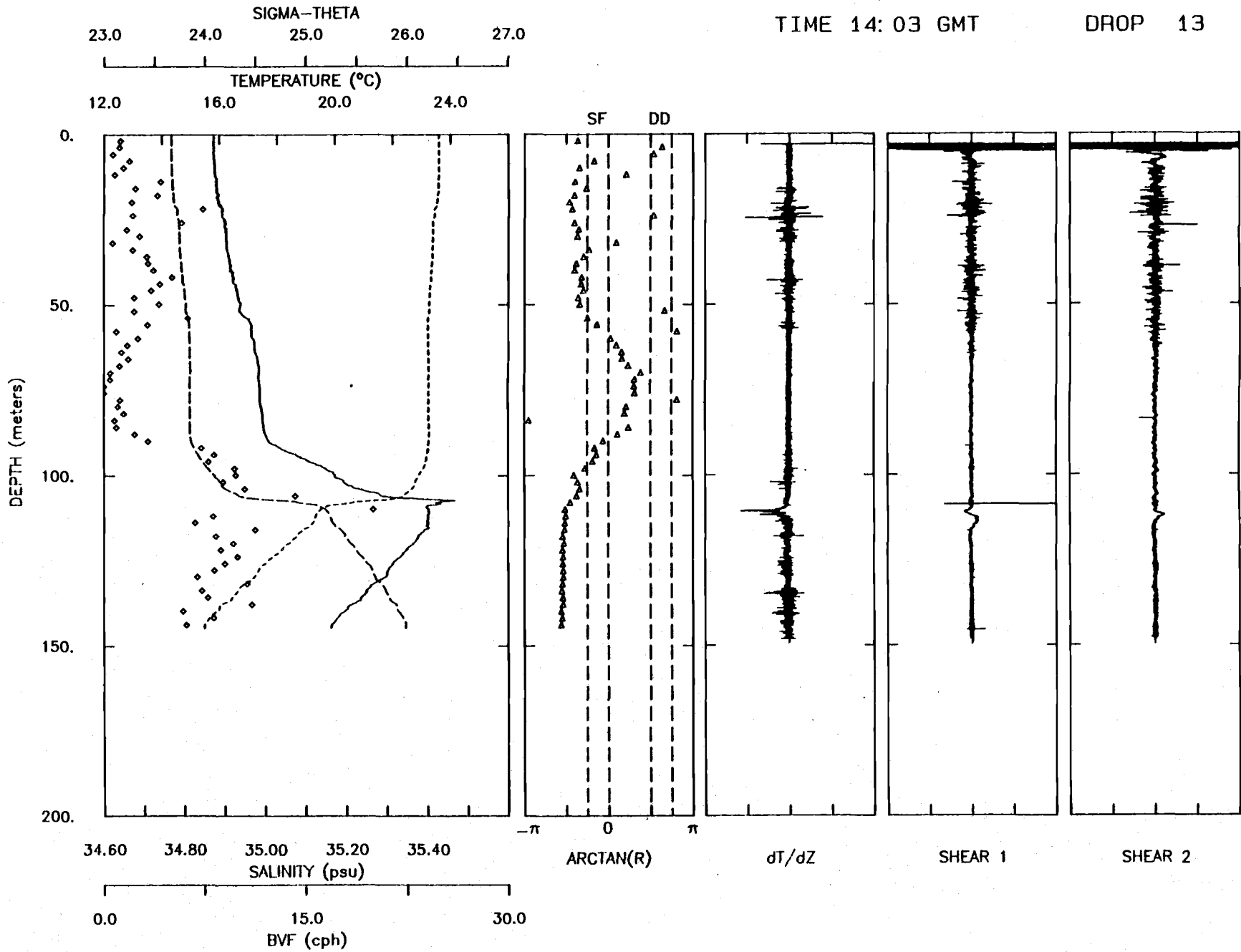
TIME 12:04 GMT

DROP 25



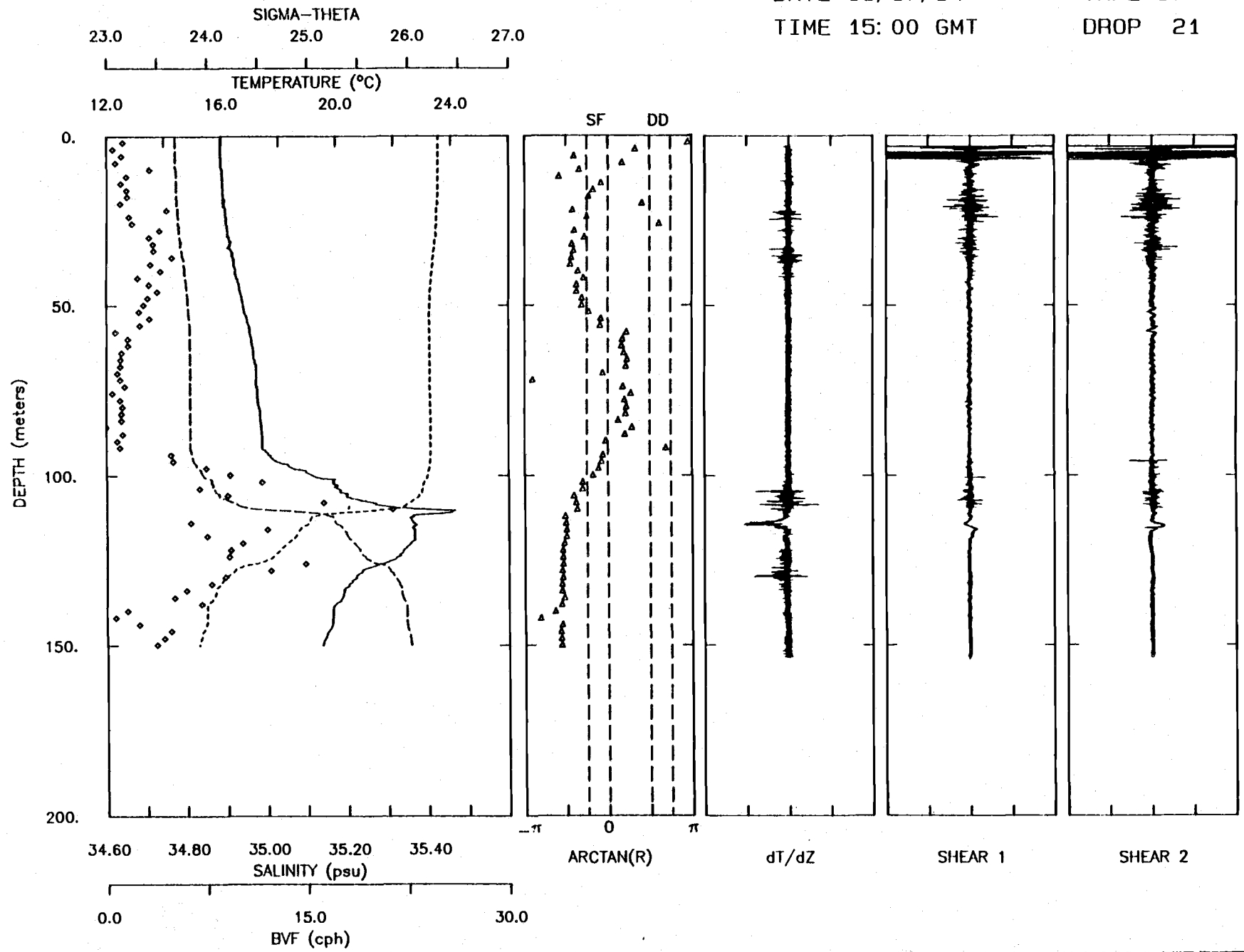
DATE 11/17/84
TIME 14:03 GMT

TAPE 57
DROP 13



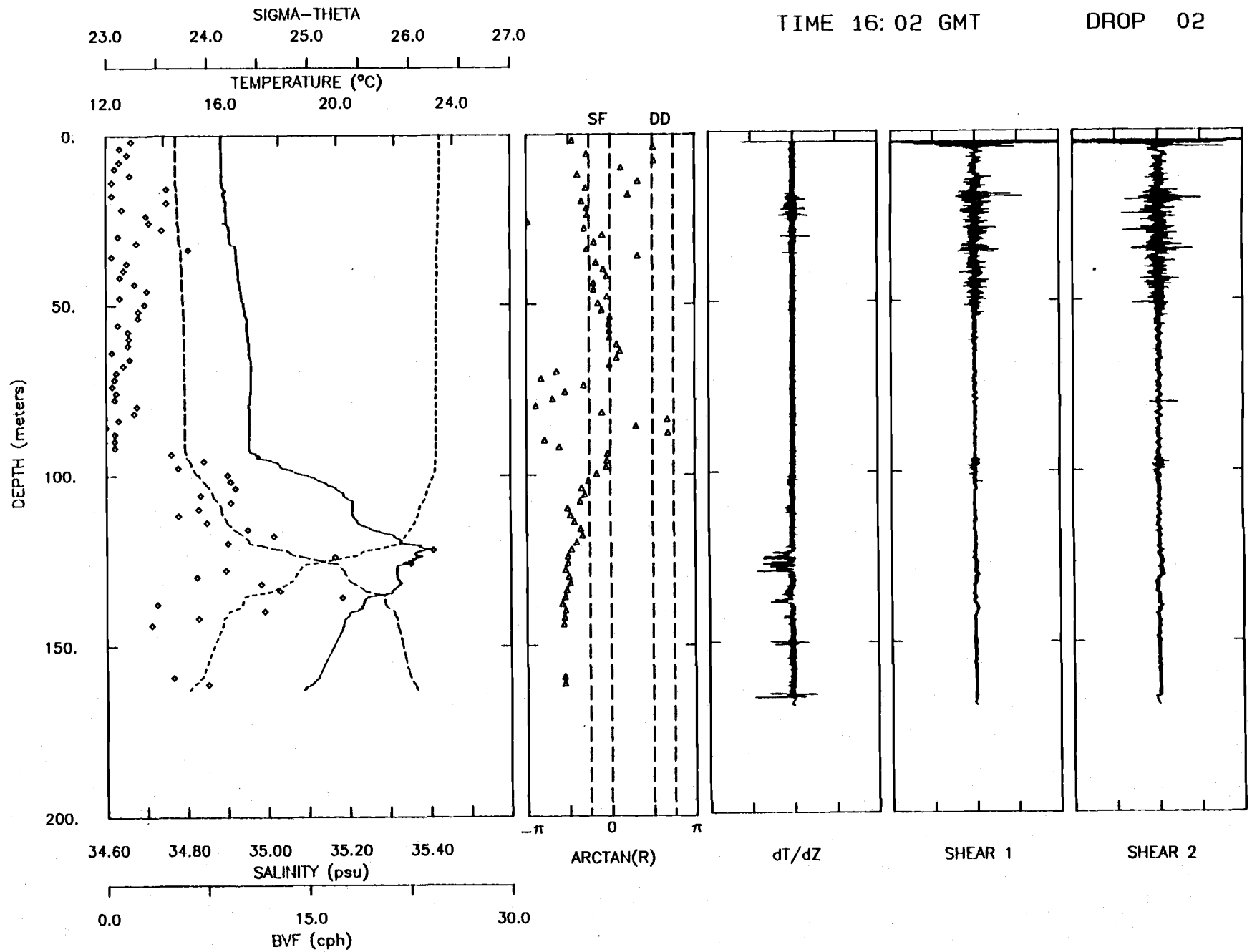
DATE 11/17/84
TIME 15:00 GMT

TAPE 57
DROP 21



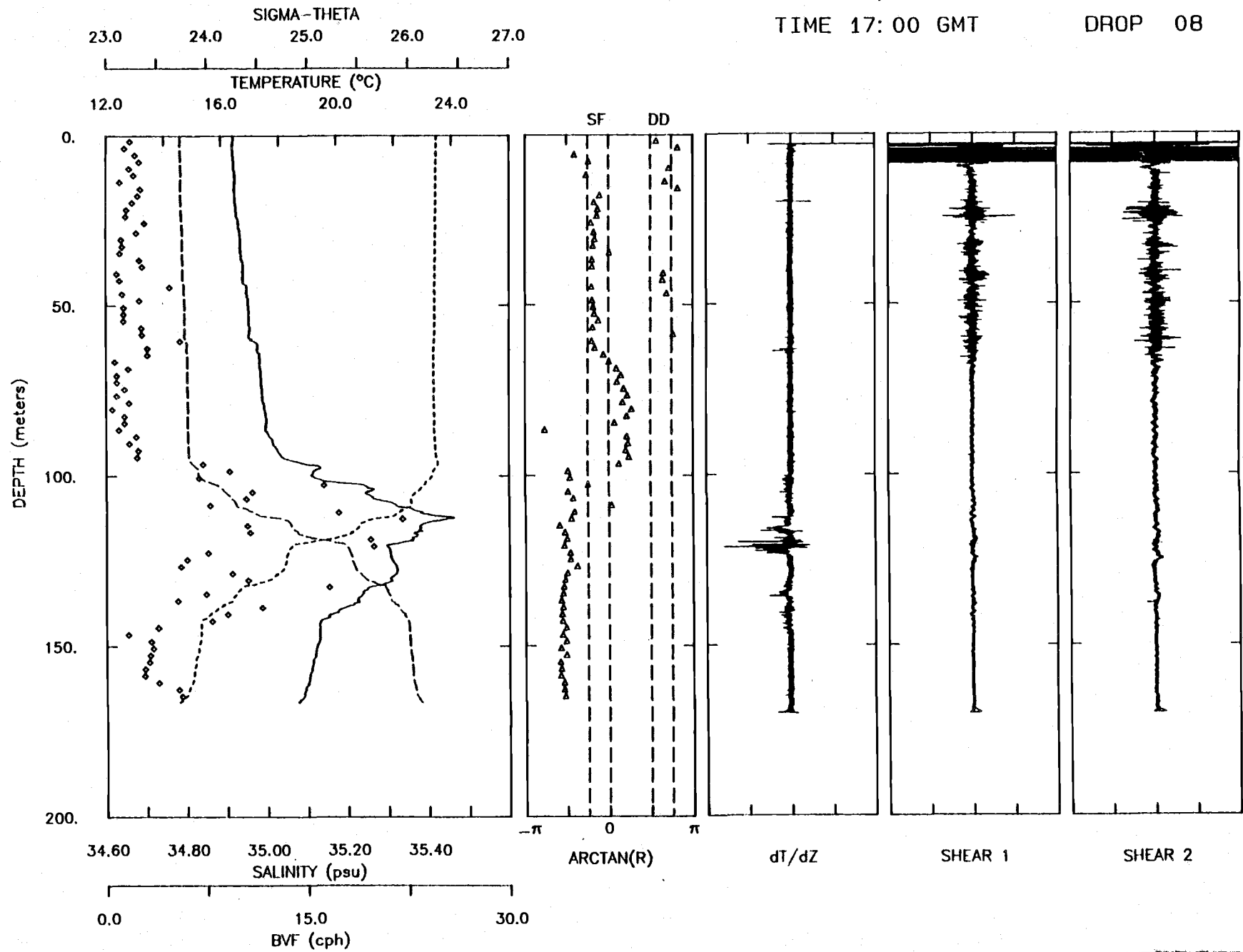
DATE 11/17/84
TIME 16:02 GMT

TAPE 59
DROP 02



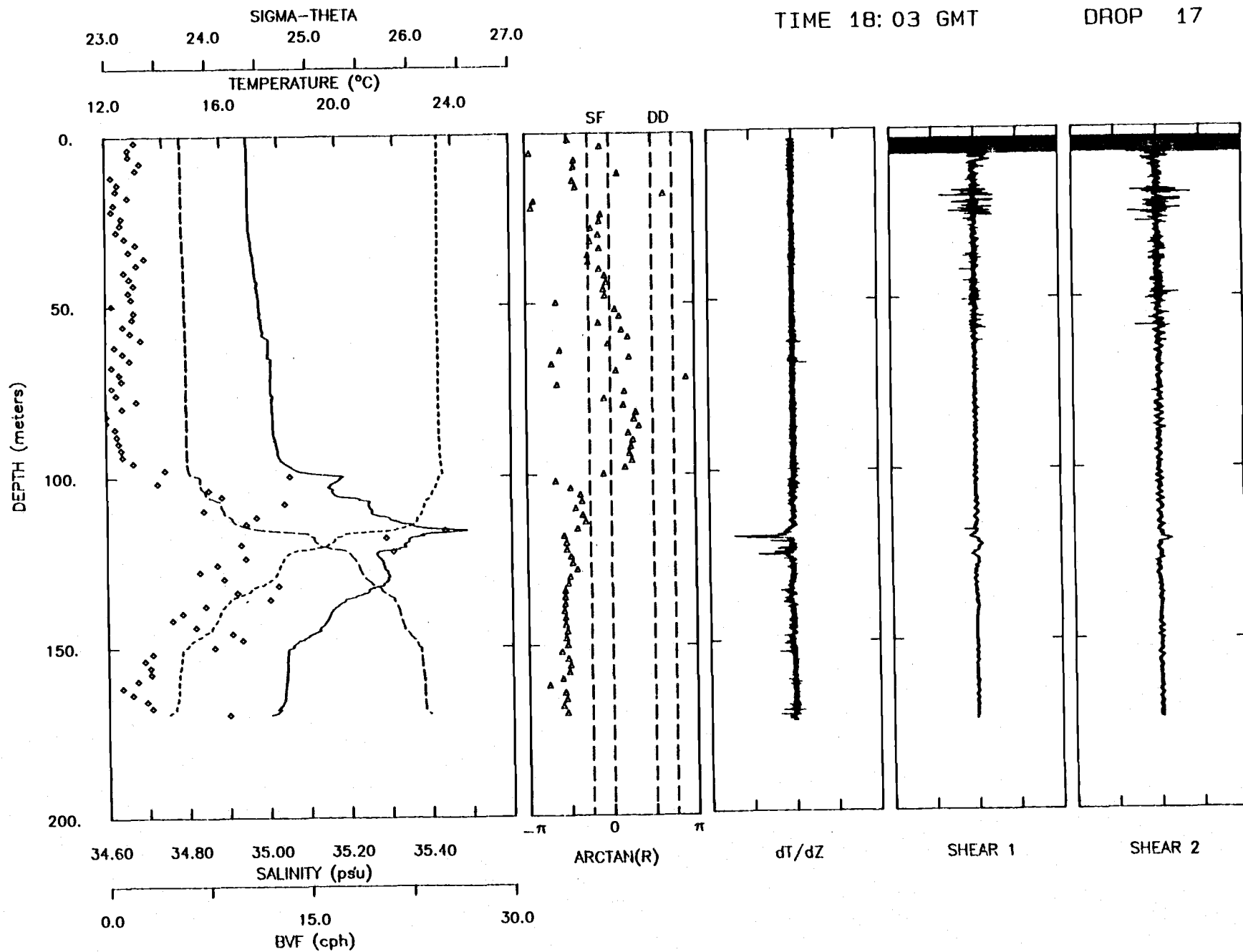
DATE 11/17/84
TIME 17:00 GMT

TAPE 59
DROP 08



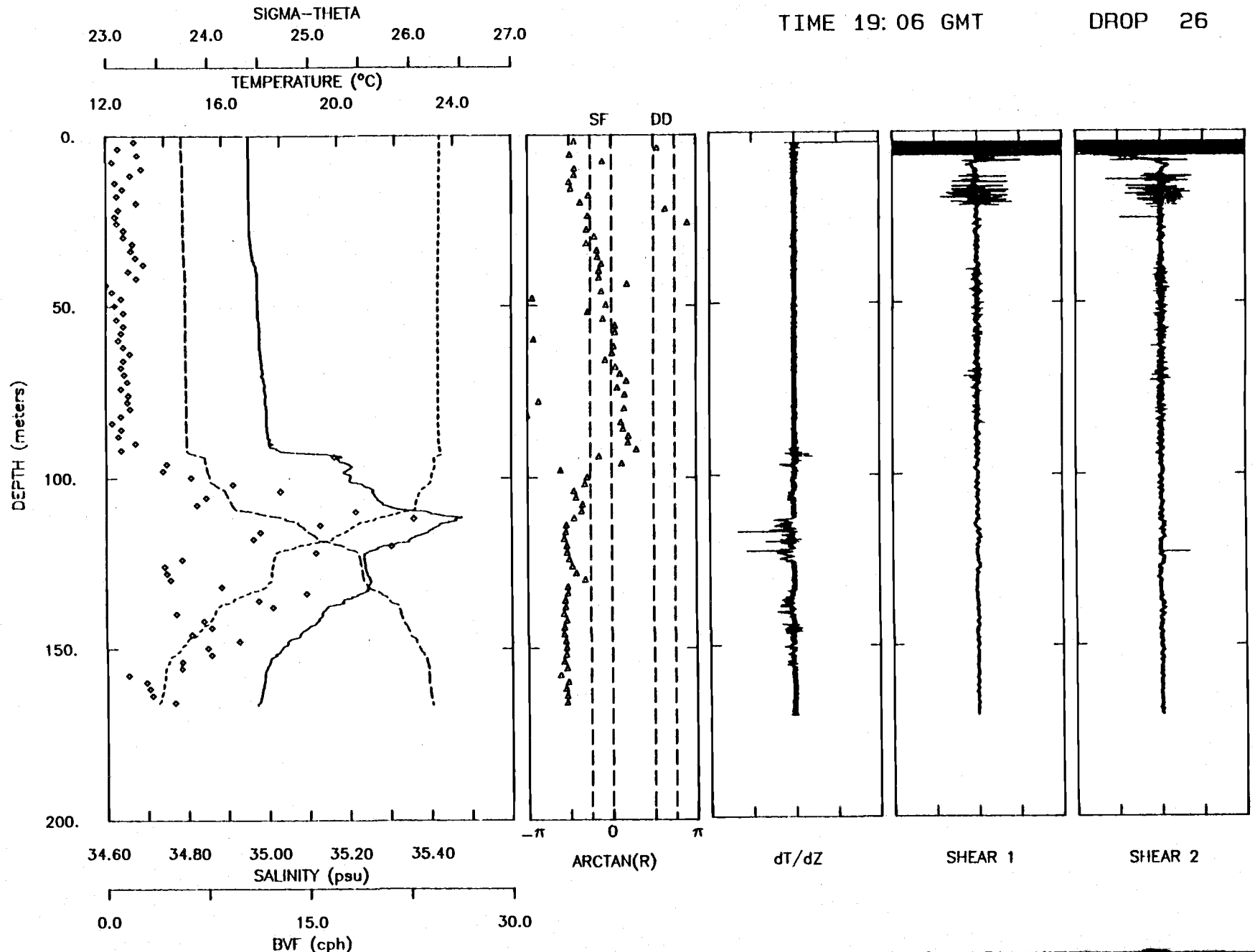
DATE 11/17/84
TIME 18:03 GMT

TAPE 59
DROP 17



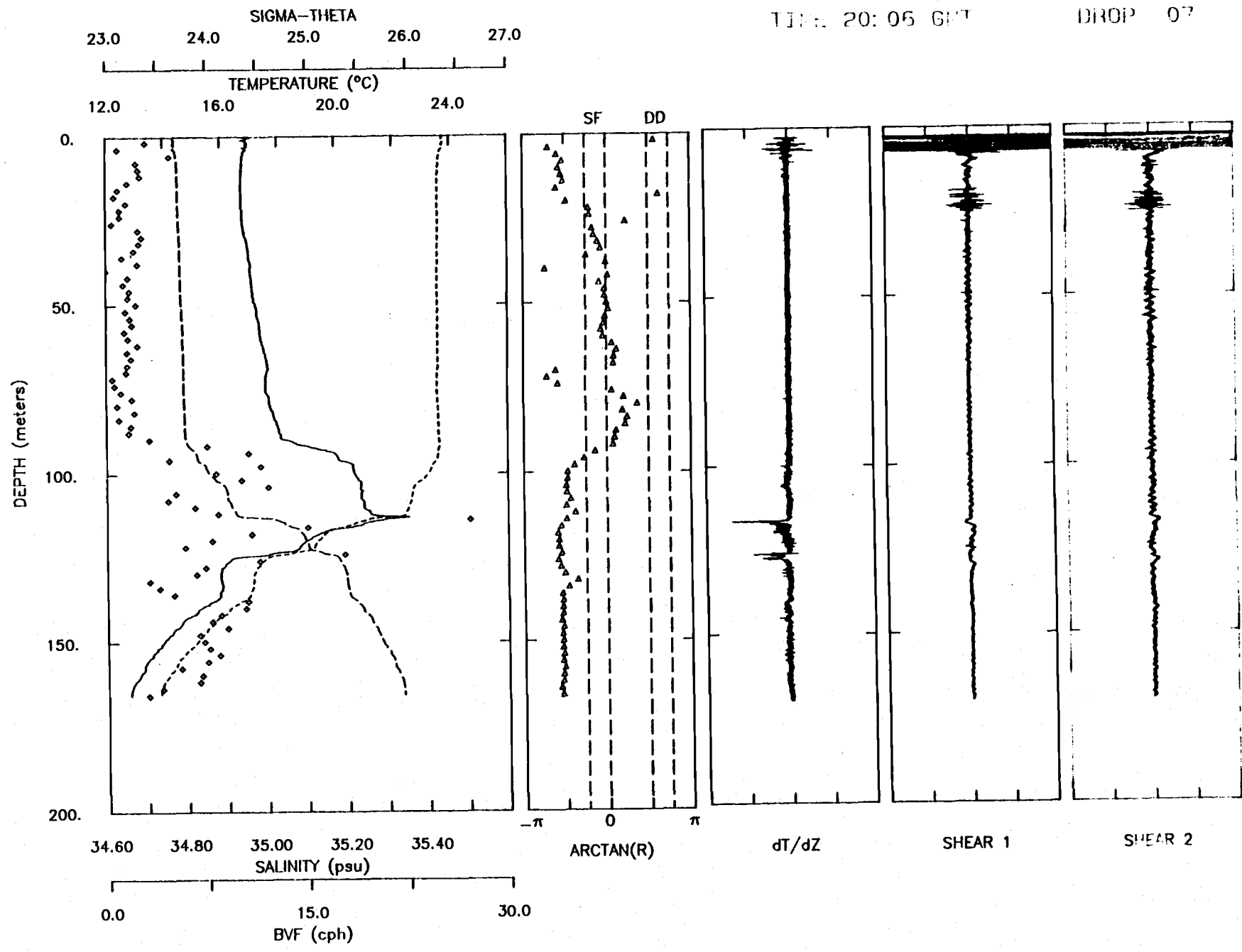
DATE 11/17/84
TIME 19:06 GMT

TAPE 59
DROP 26



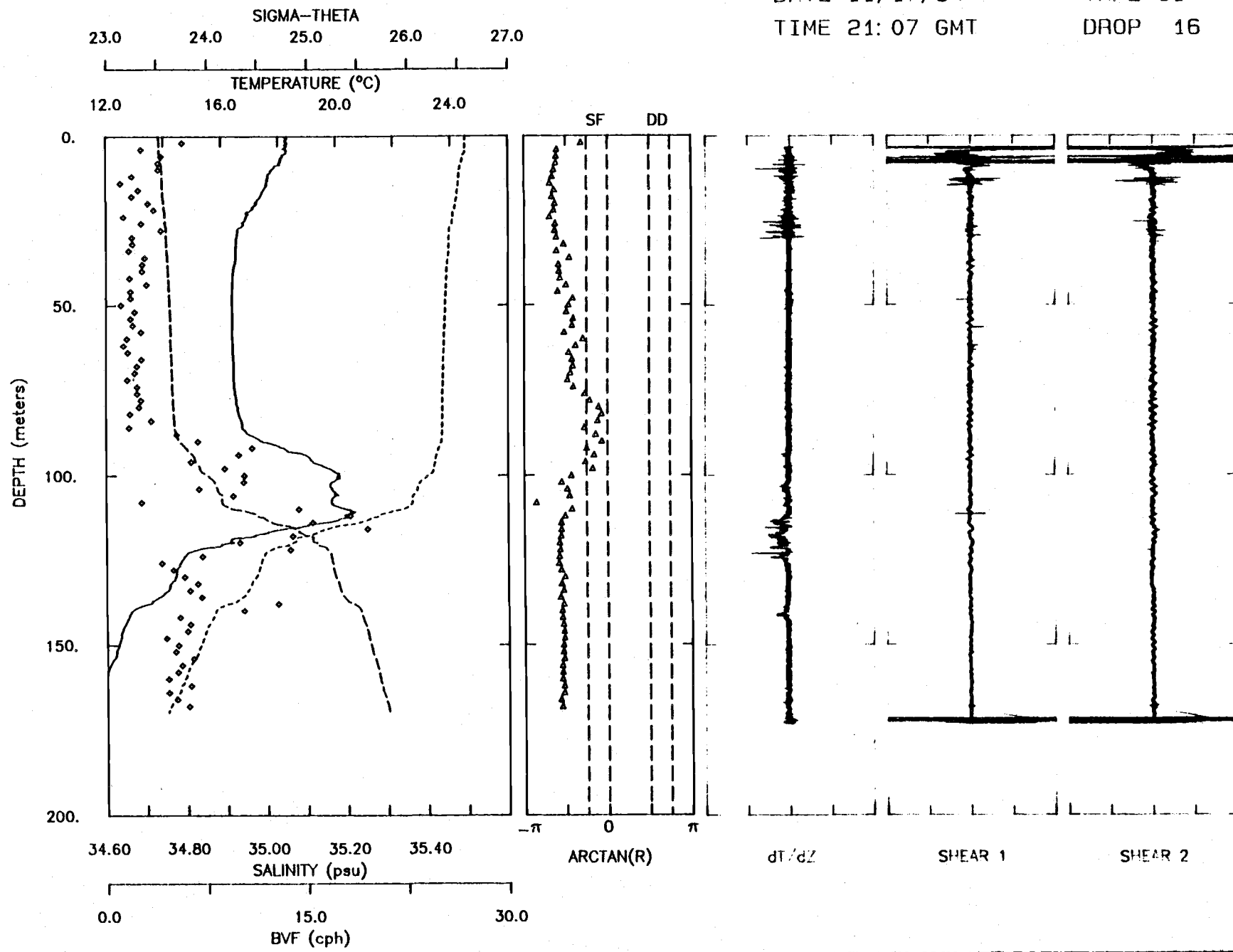
DATE 11/17/84
TIME 20:06 GMT

TAPE 61
DROP 07



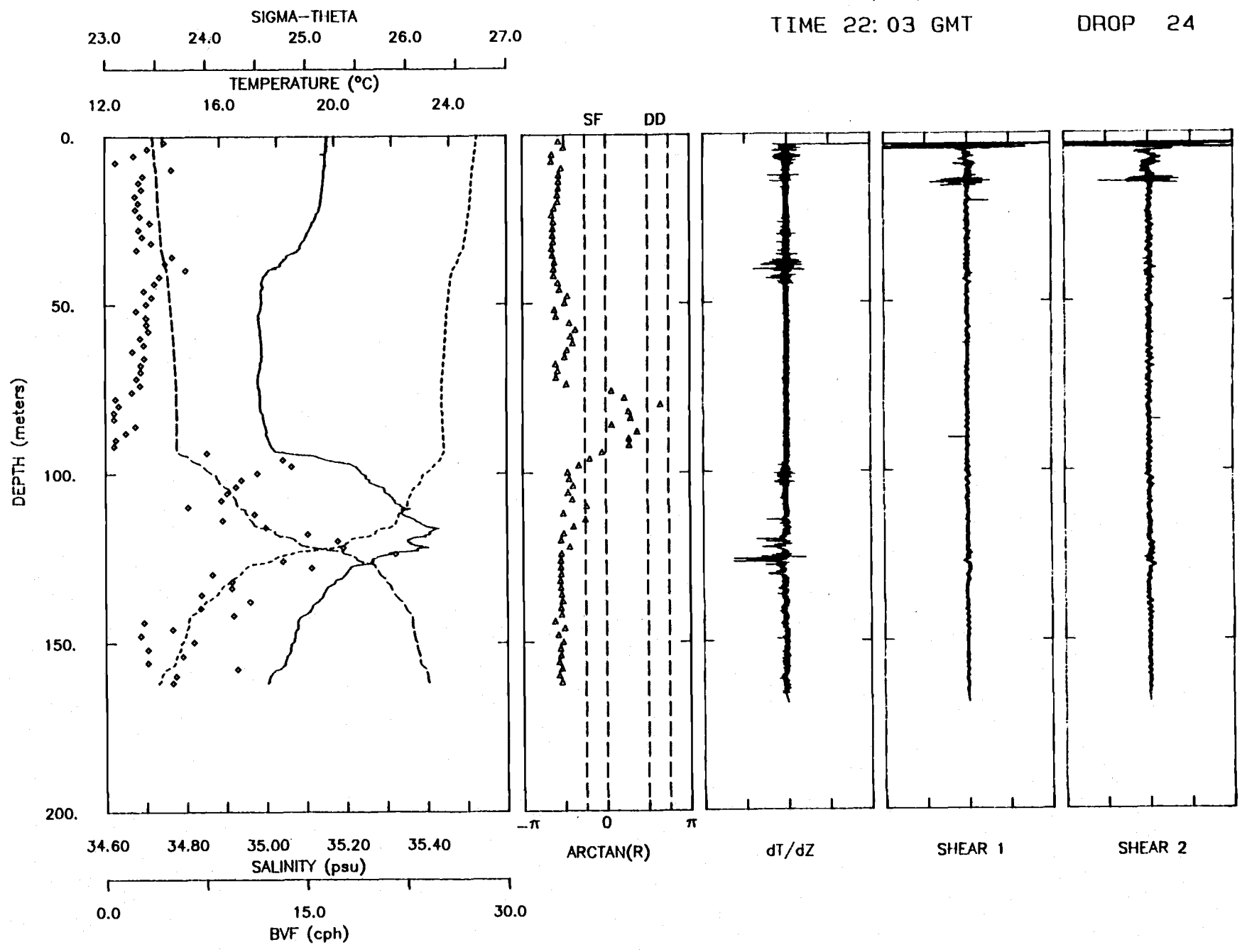
DATE 11/17/84
TIME 21:07 GMT

TAPE 61
DROP 16



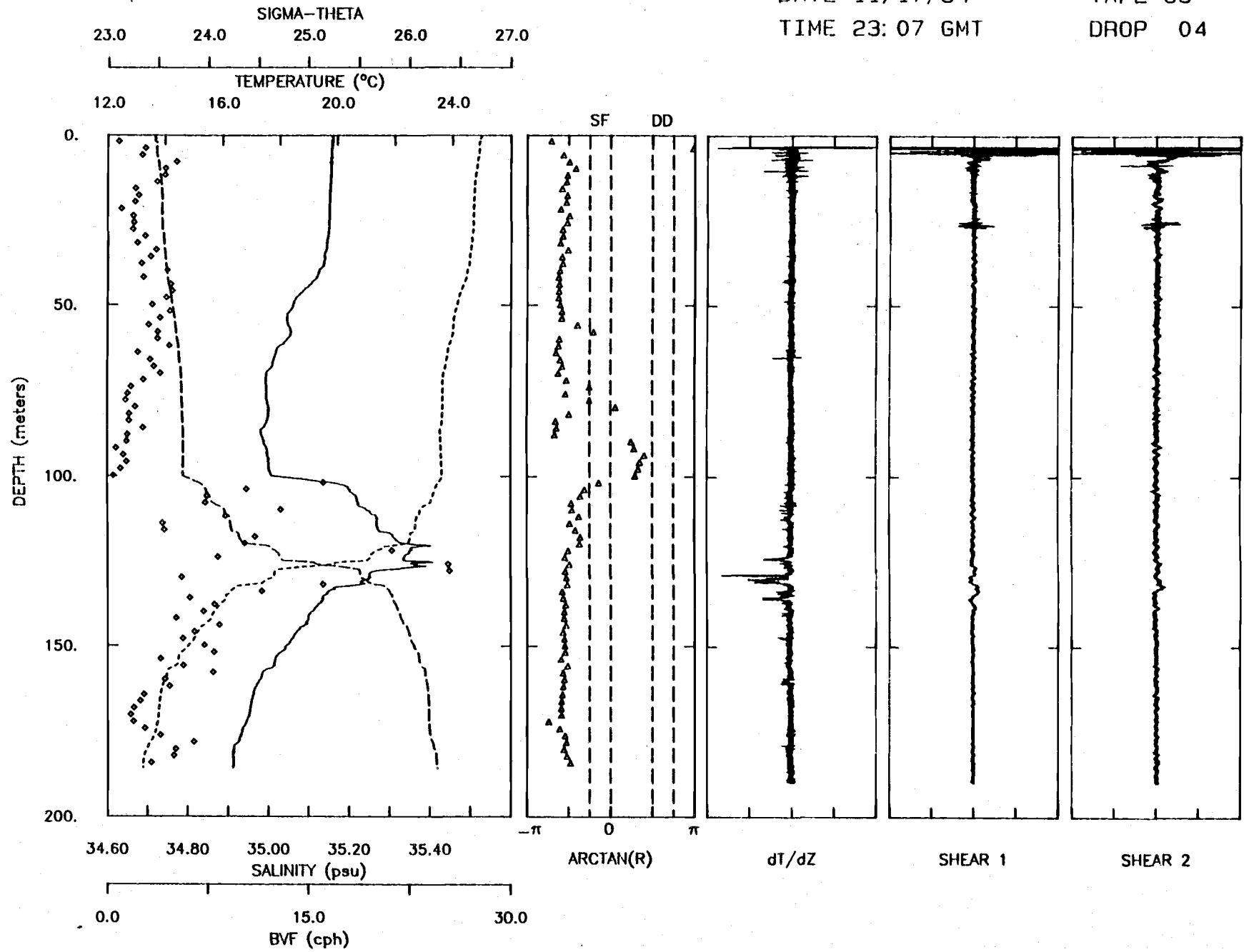
DATE 11/17/84
TIME 22:03 GMT

TAPE 61
DROP 24



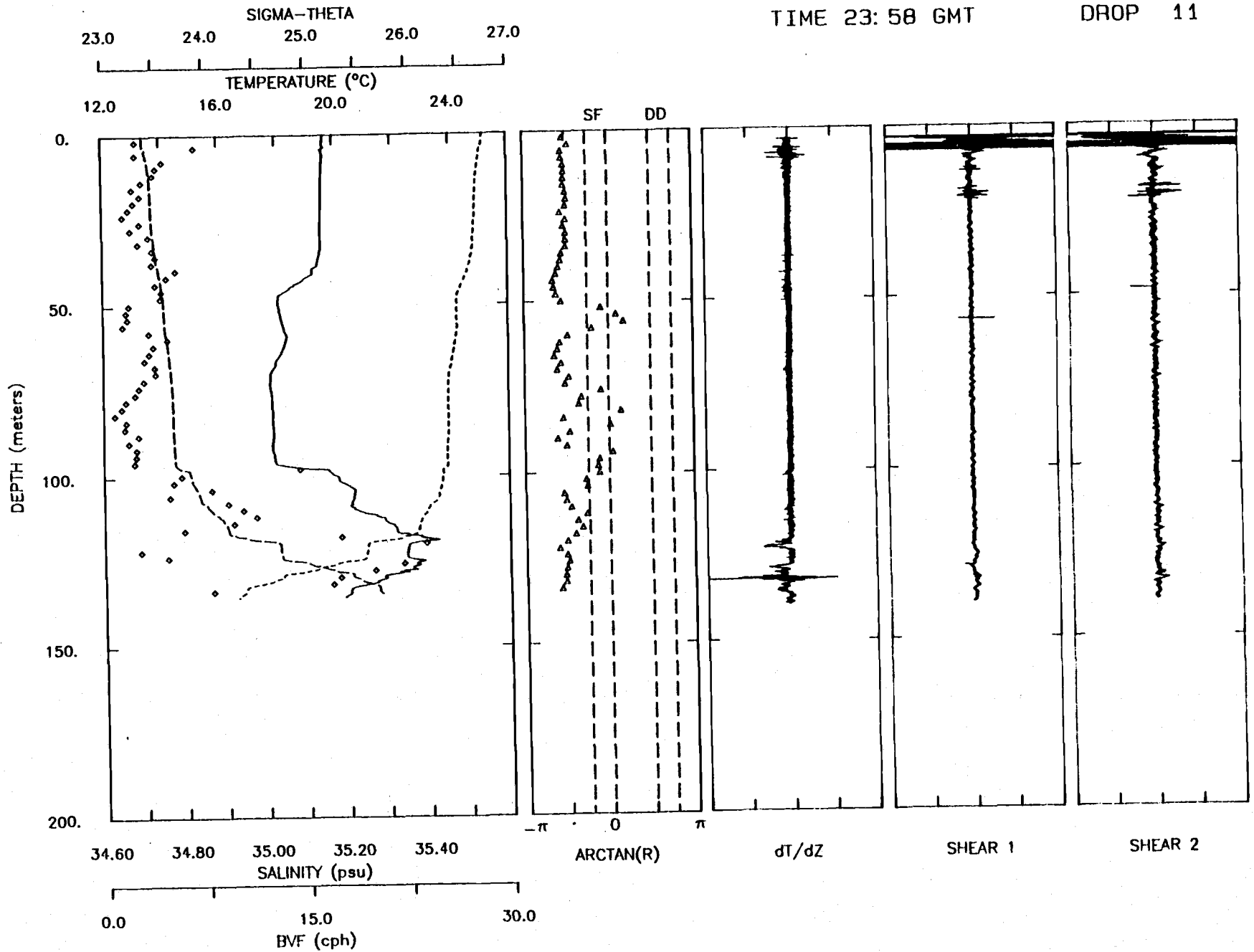
DATE 11/17/84
TIME 23:07 GMT

TAPE 63
DROP 04



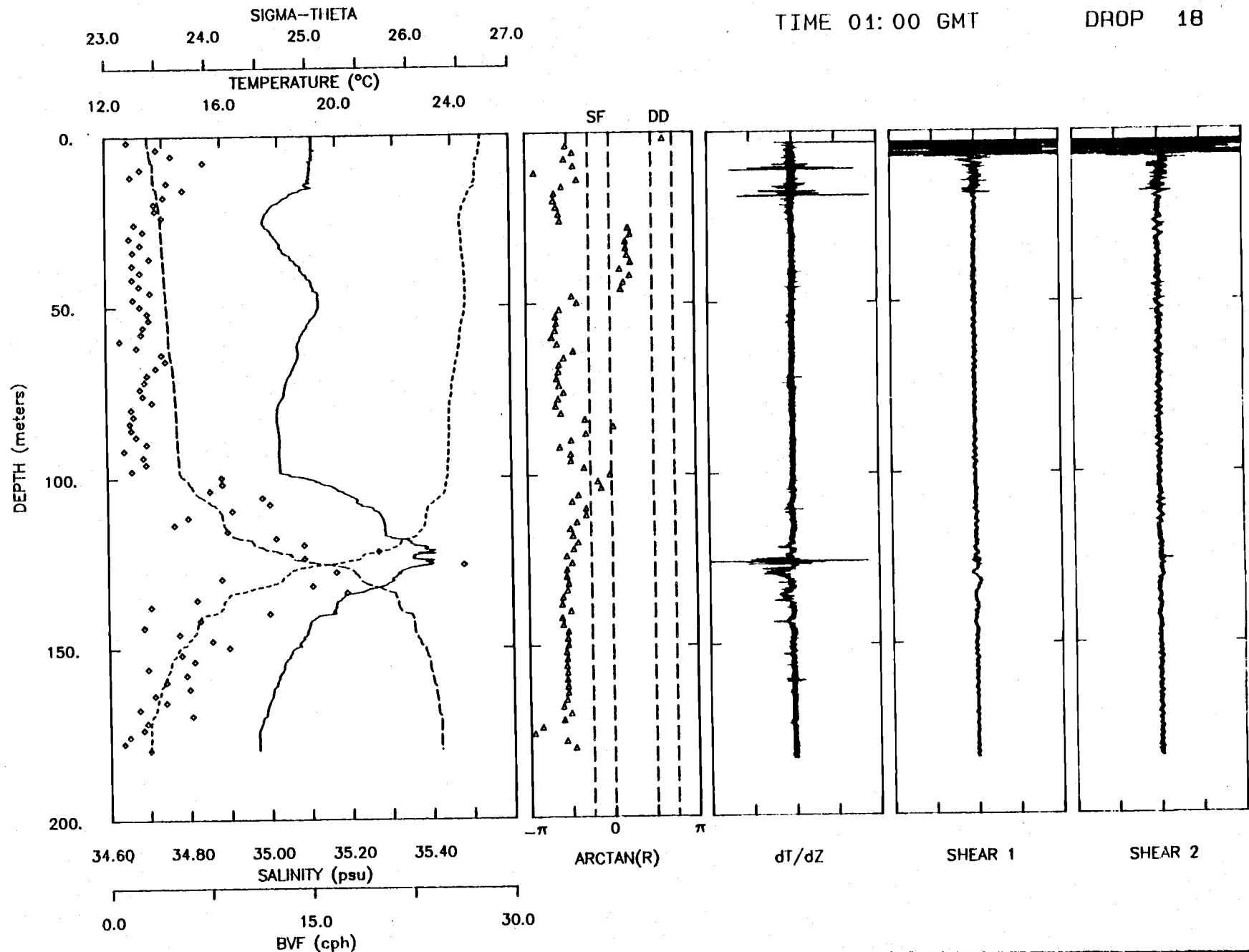
DATE 11/17/84
TIME 23:58 GMT

TAPE 63
DROP 11



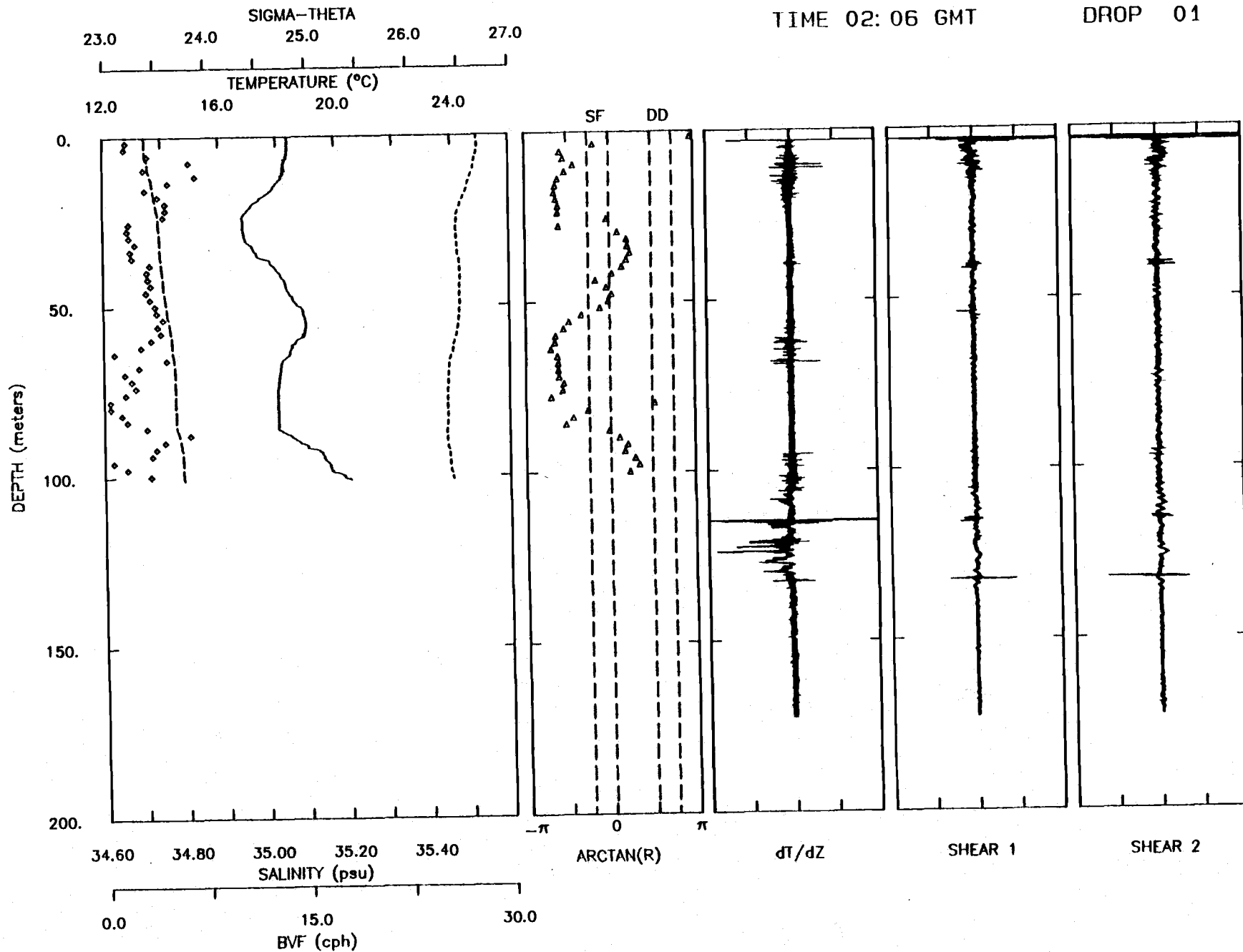
DATE 11/18/84
TIME 01:00 GMT

TAPE 63
DROP 18



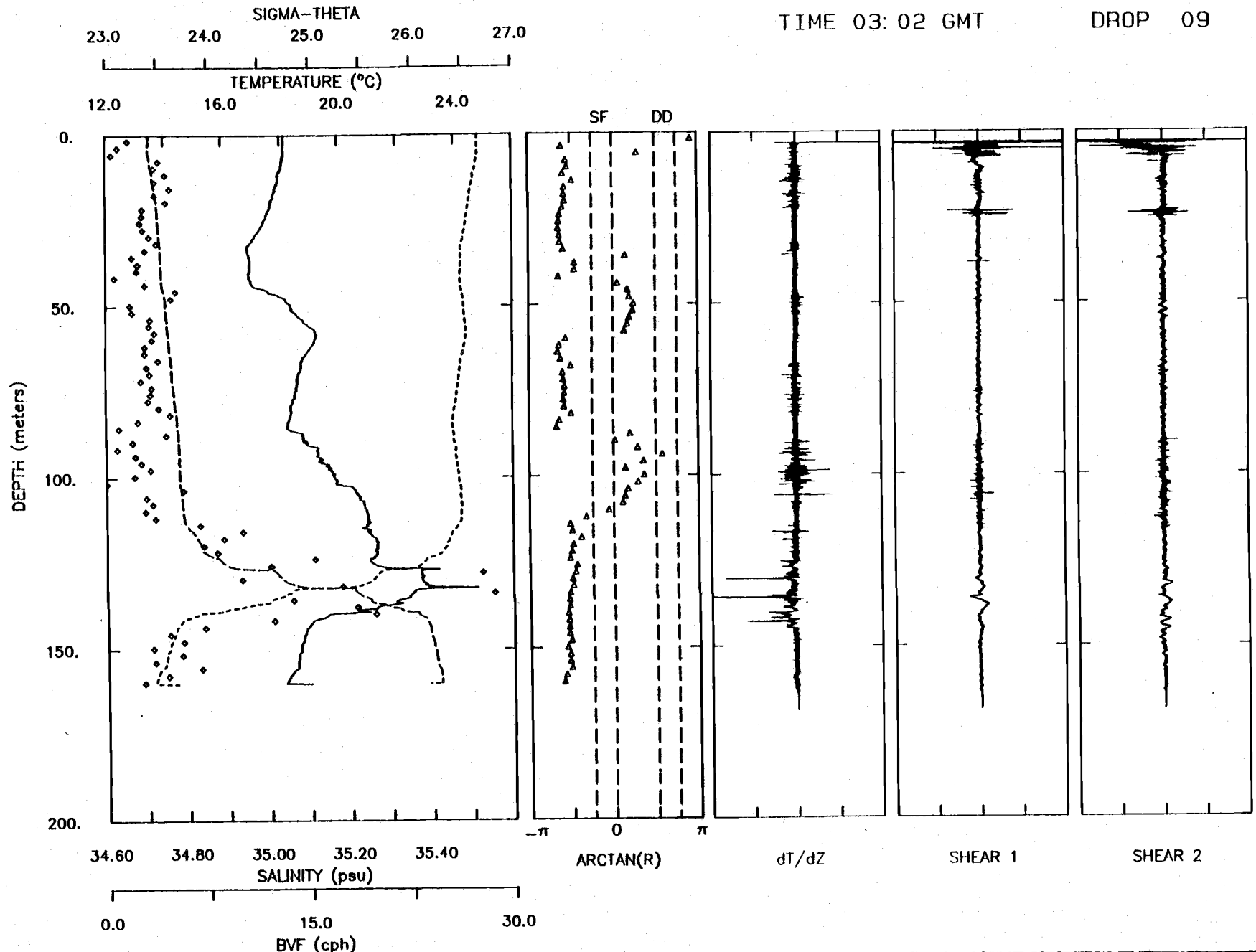
DATE 11/18/84
TIME 02:06 GMT

TAPE 65
DROP 01



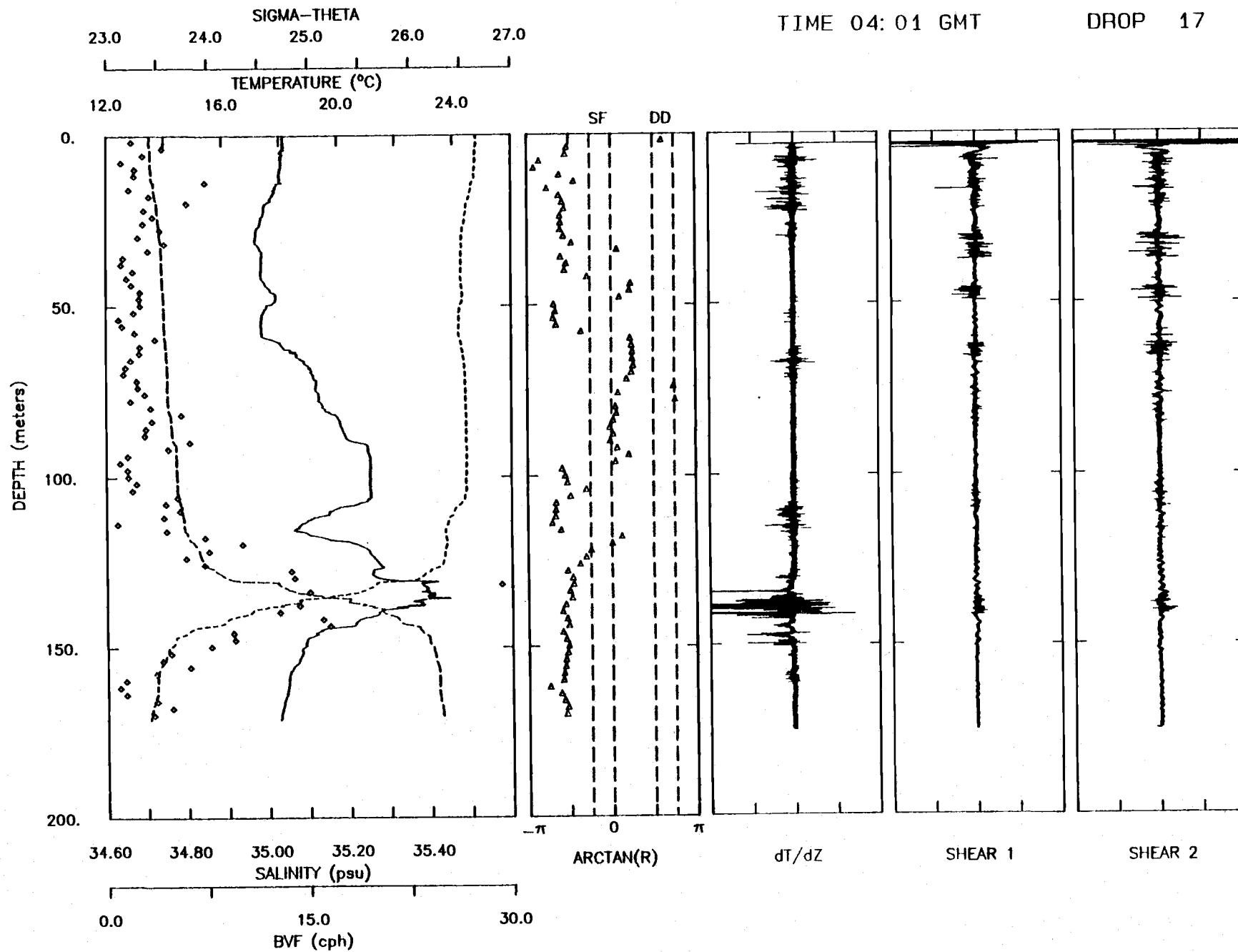
DATE 11/18/84
TIME 03:02 GMT

TAPE 65
DROP 09



DATE 11/18/84
TIME 04:01 GMT

TAPE 65
DROP 17

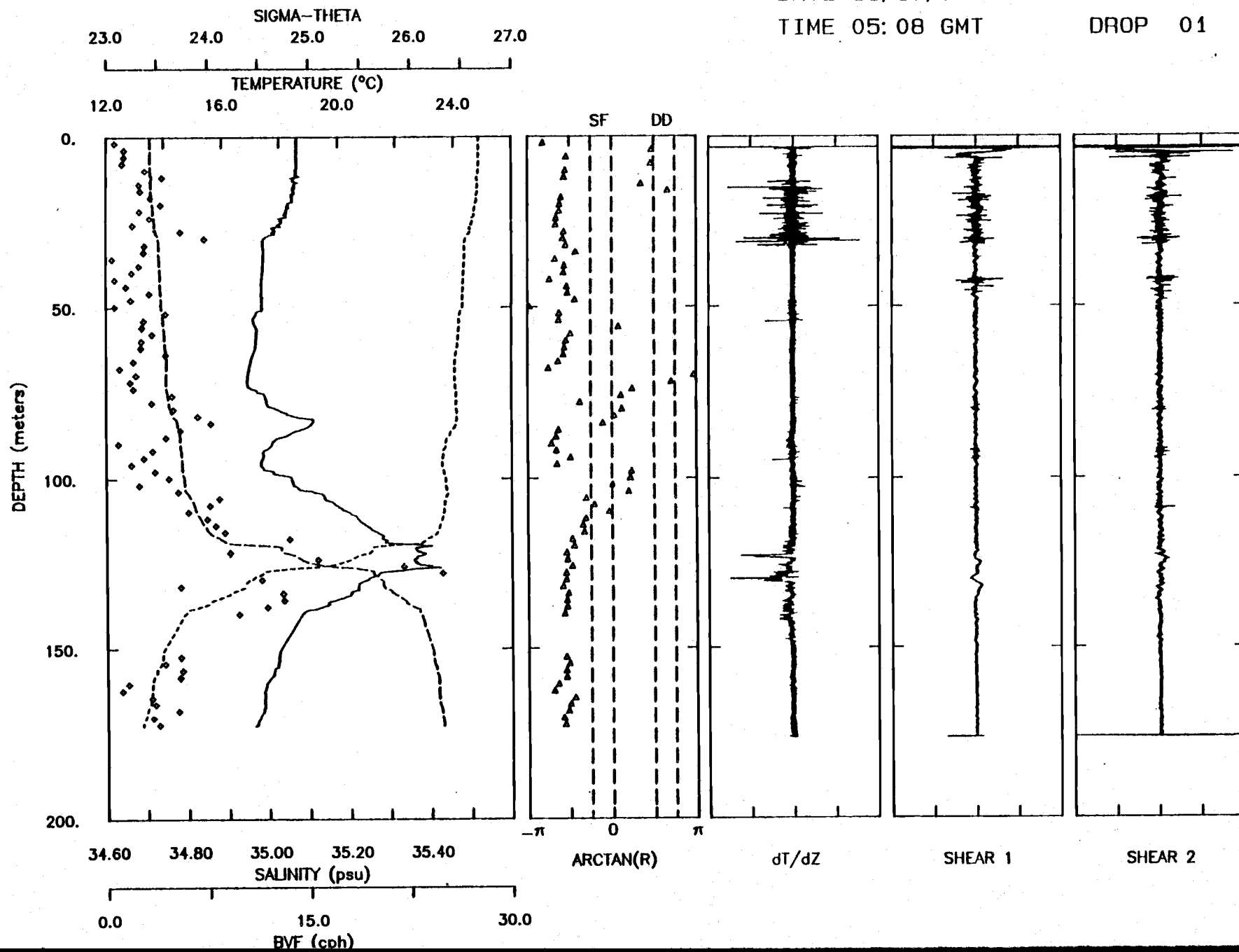


DATE 11/18/84

TAPE 66

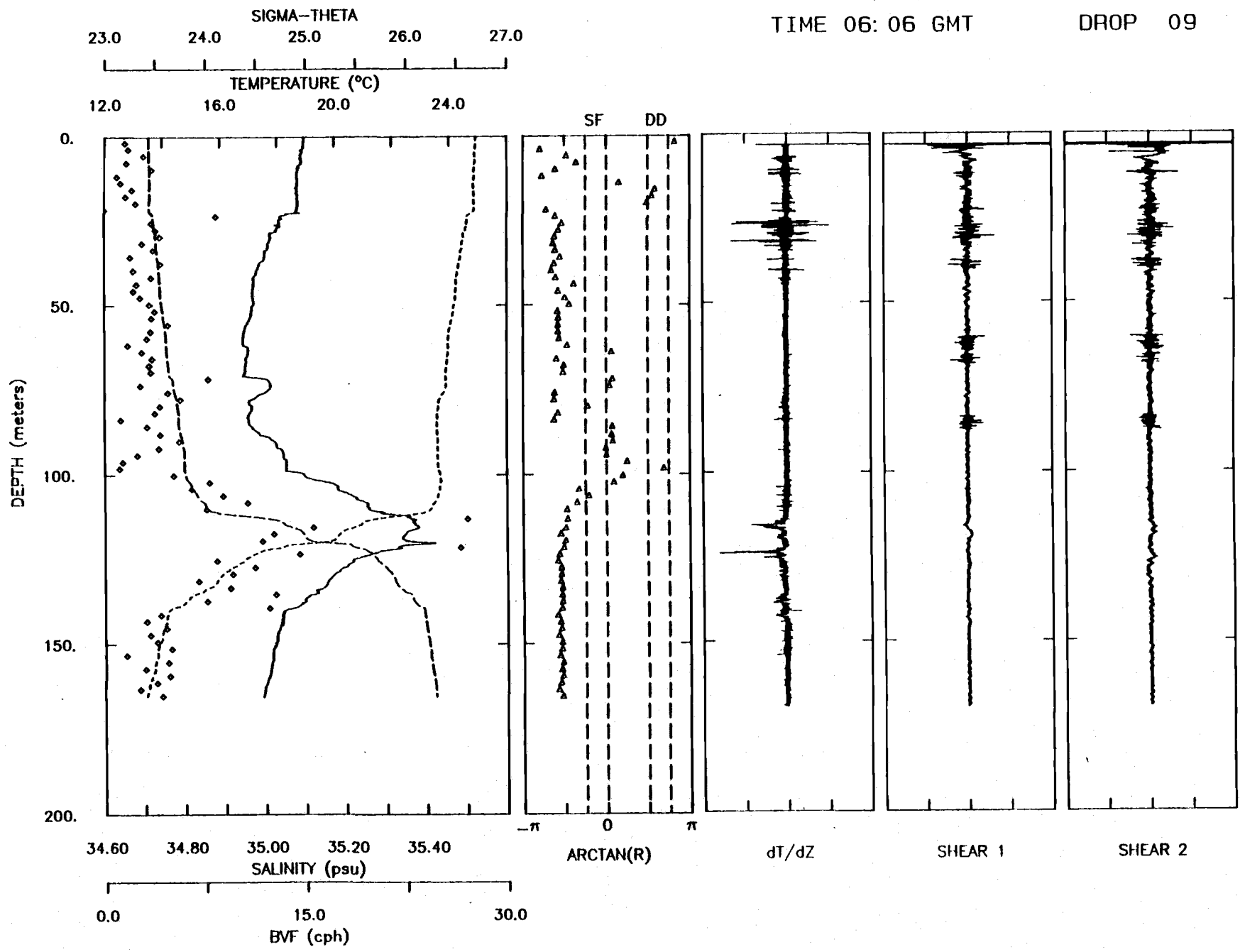
TIME 05:08 GMT

DROP 01



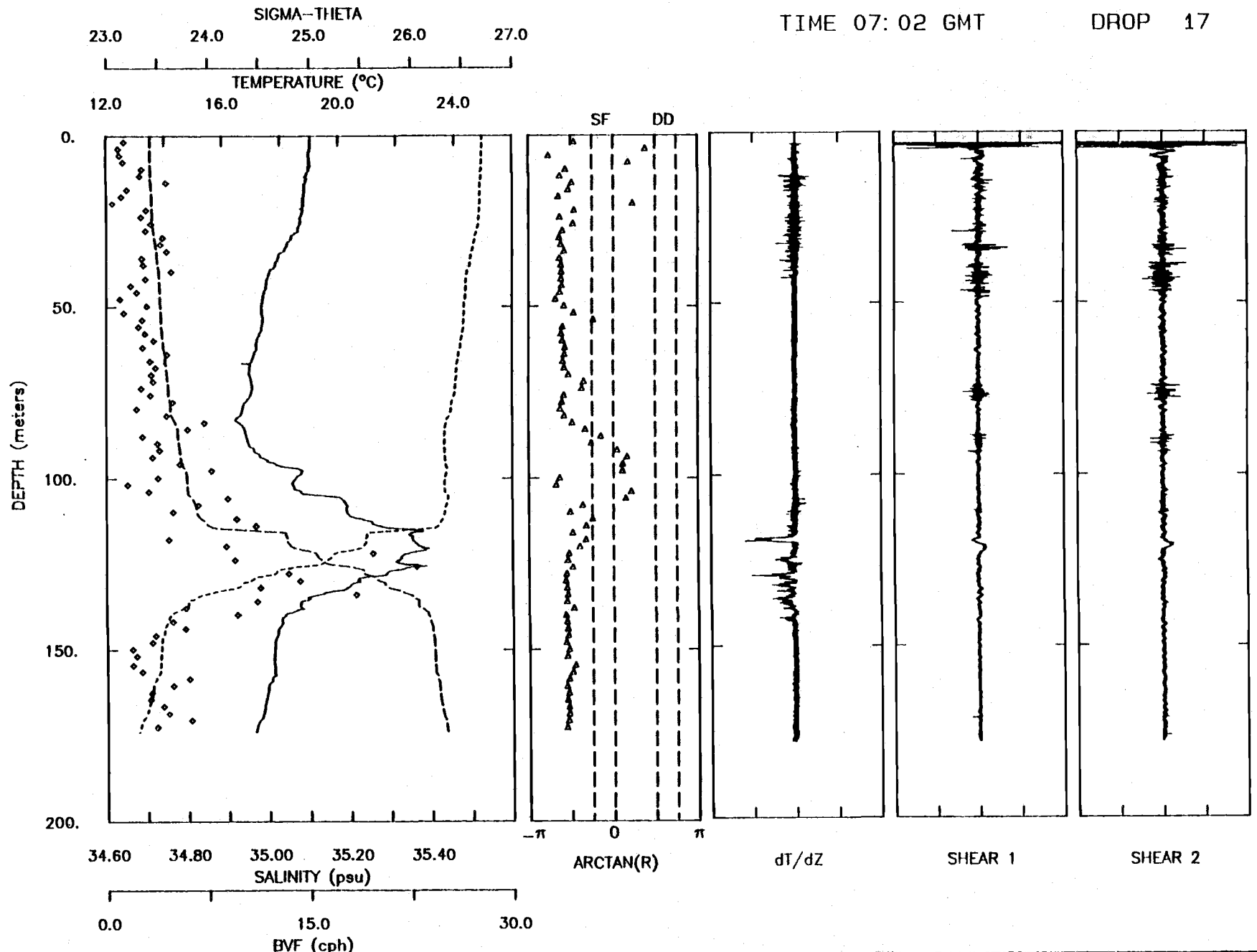
DATE 11/18/84
TIME 06:06 GMT

TAPE 66
DROP 09



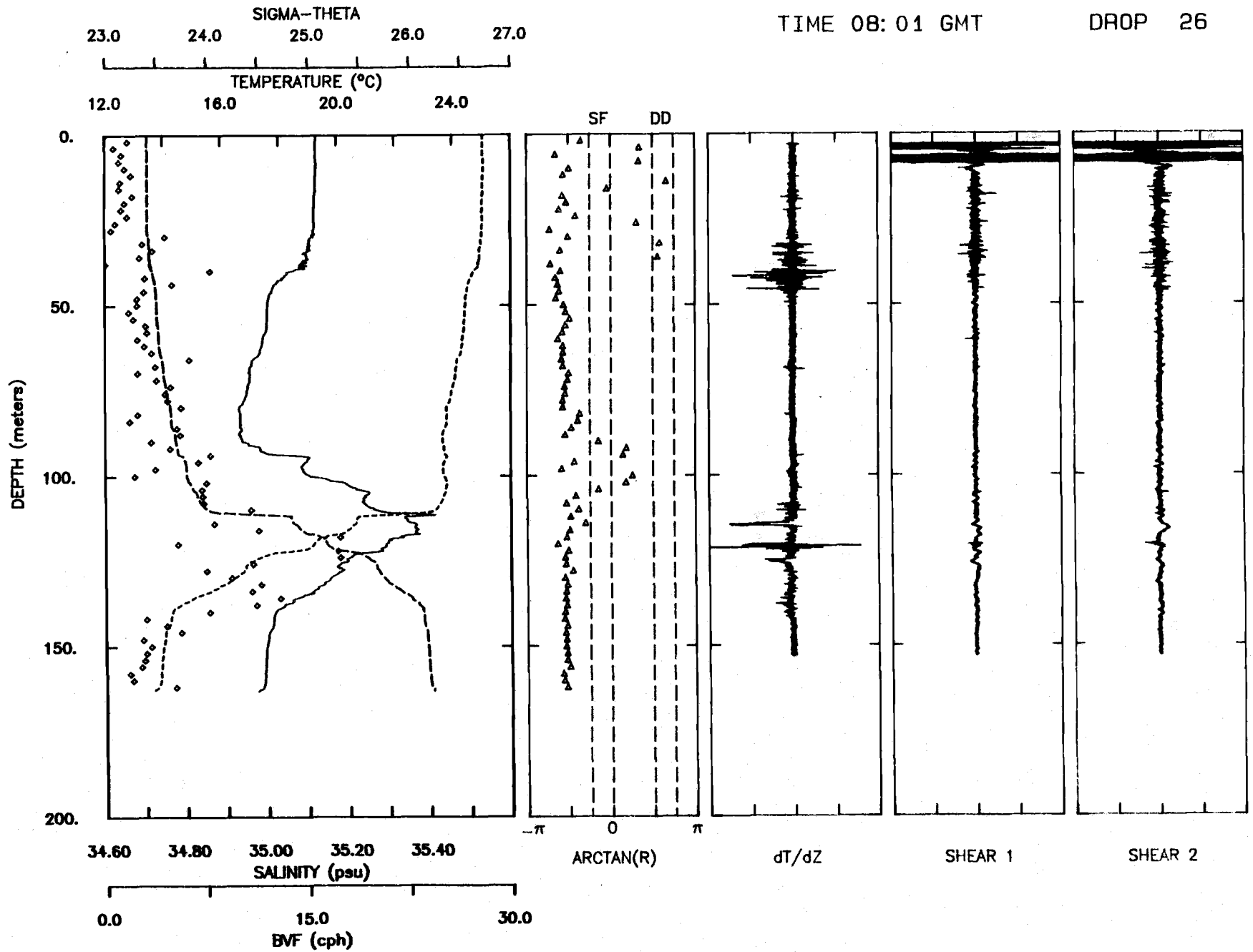
DATE 11/18/84
TIME 07:02 GMT

TAPE 66
DROP 17



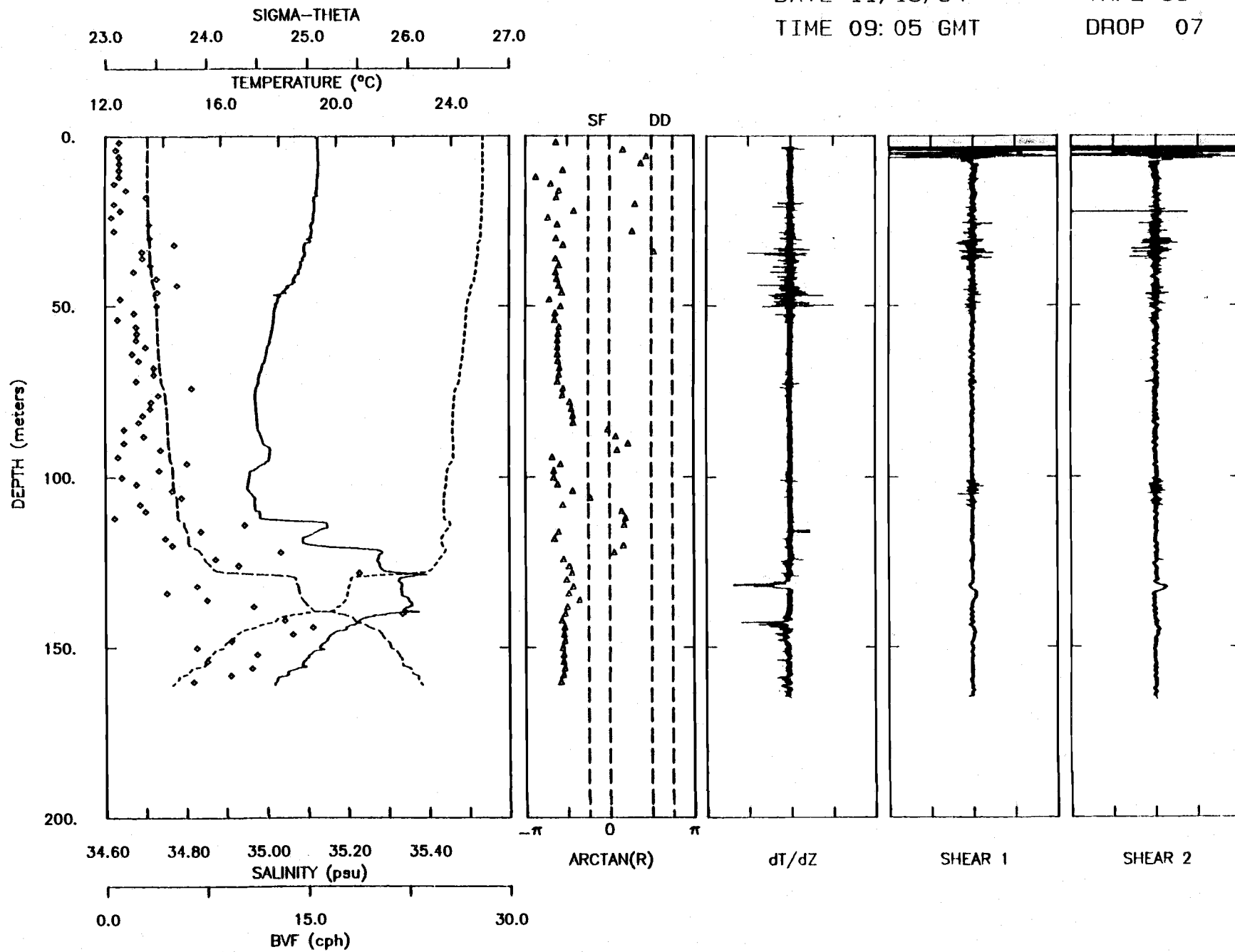
DATE 11/18/84
TIME 08:01 GMT

TAPE 66
DROP 26



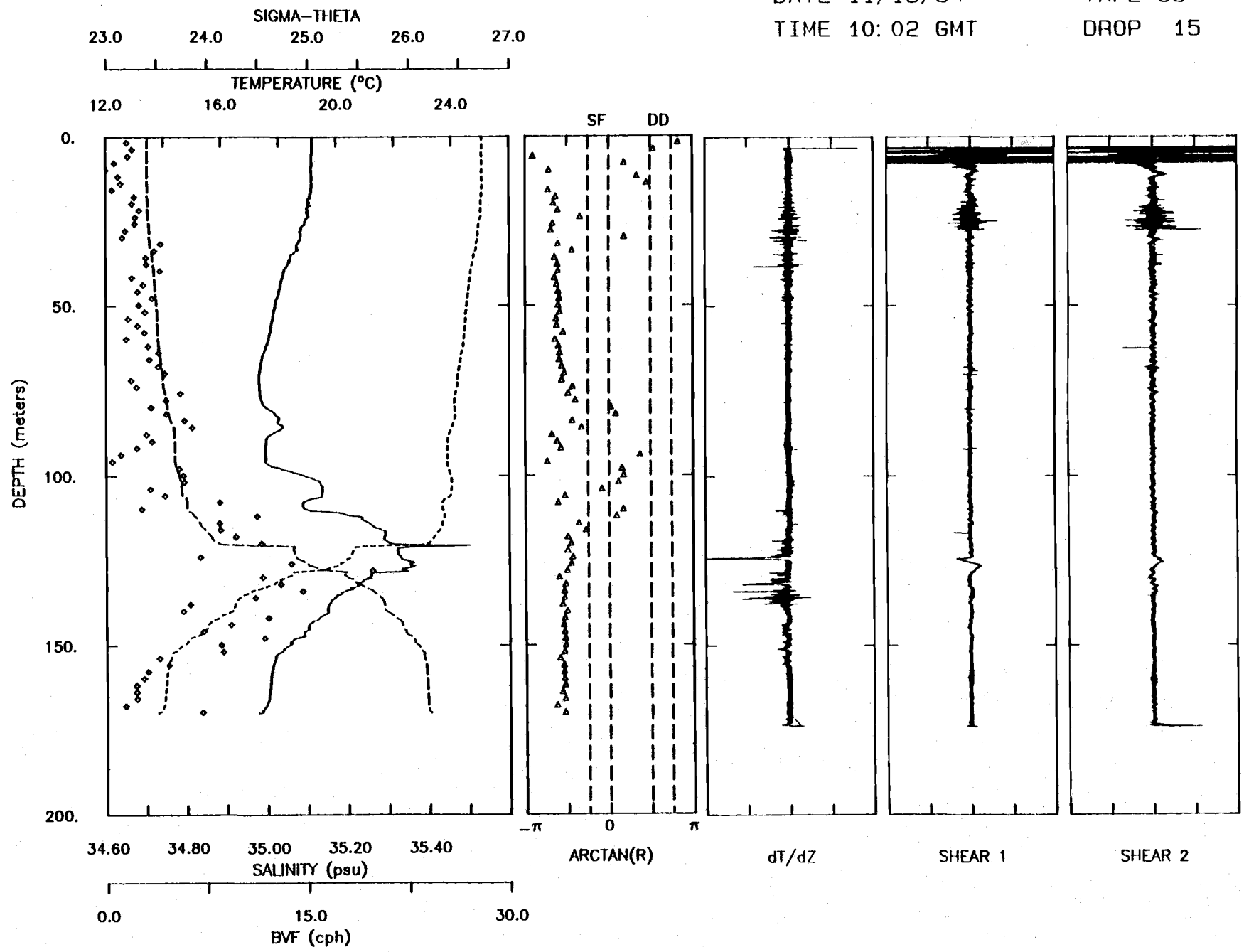
DATE 11/18/84
TIME 09:05 GMT

TAPE 68
DROP 07



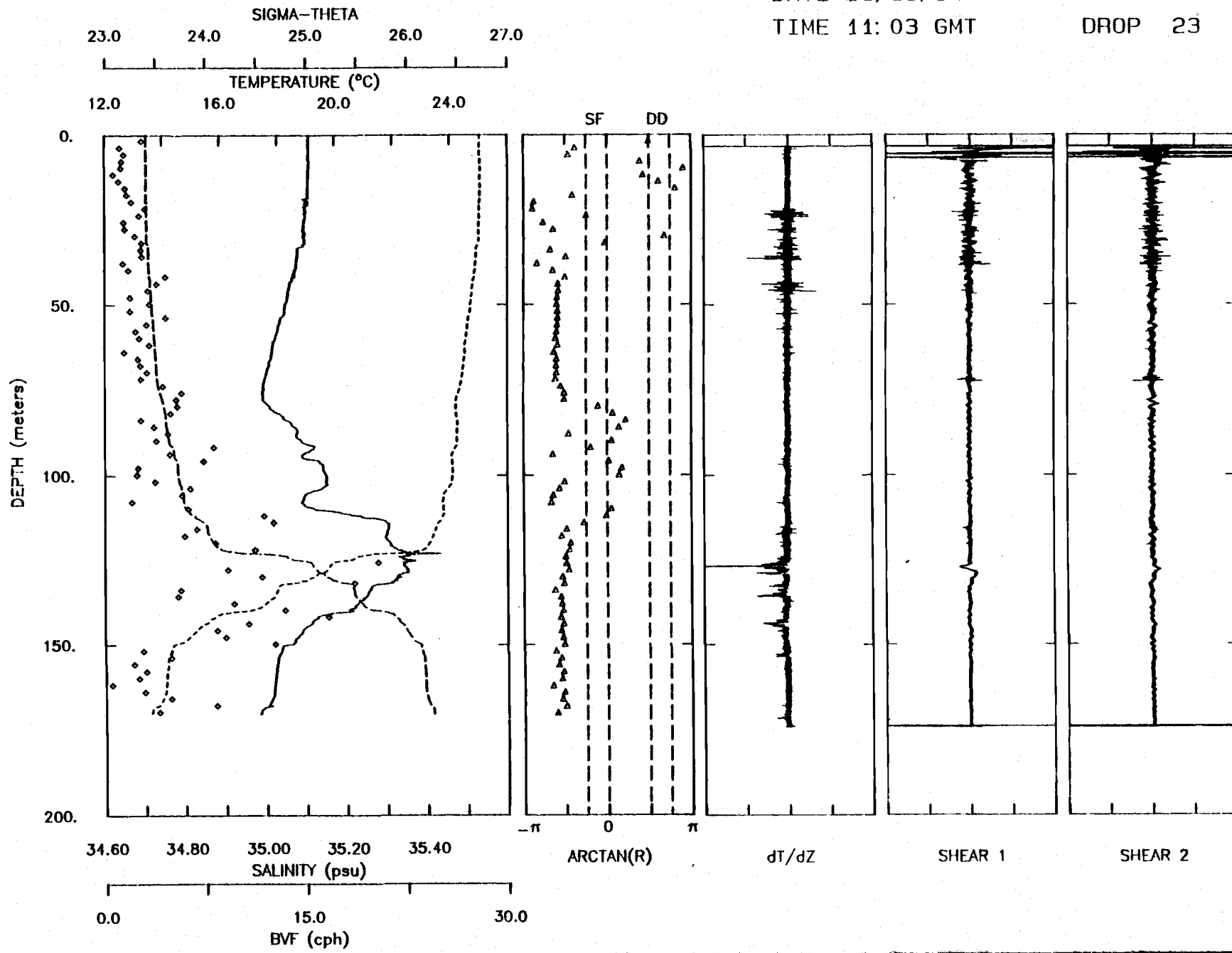
DATE 11/18/84
TIME 10:02 GMT

TAPE 68
DROP 15



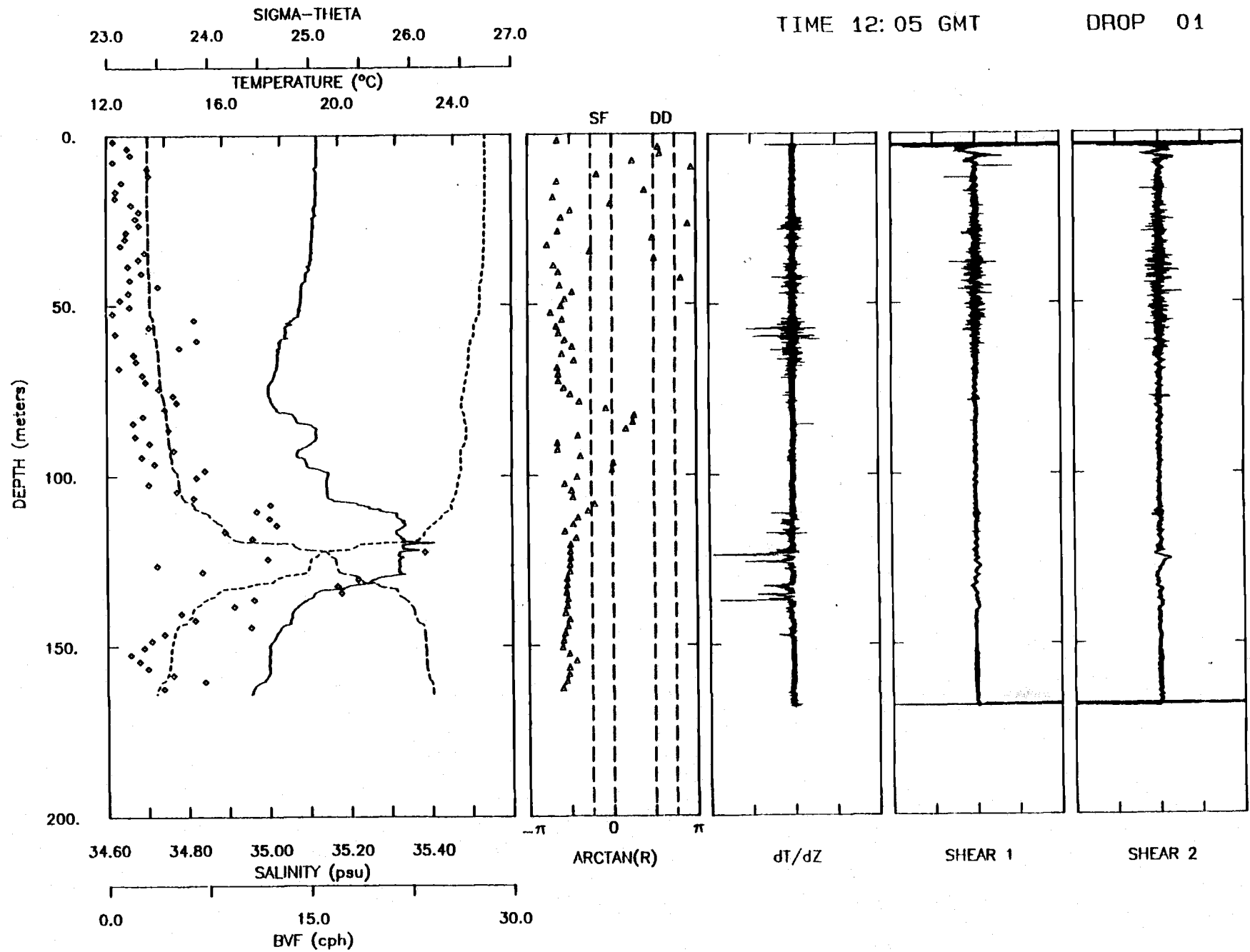
DATE 11/18/84
TIME 11:03 GMT

TAPE 68
DROP 23



DATE 11/18/84
TIME 12:05 GMT

TAPE 71
DROP 01

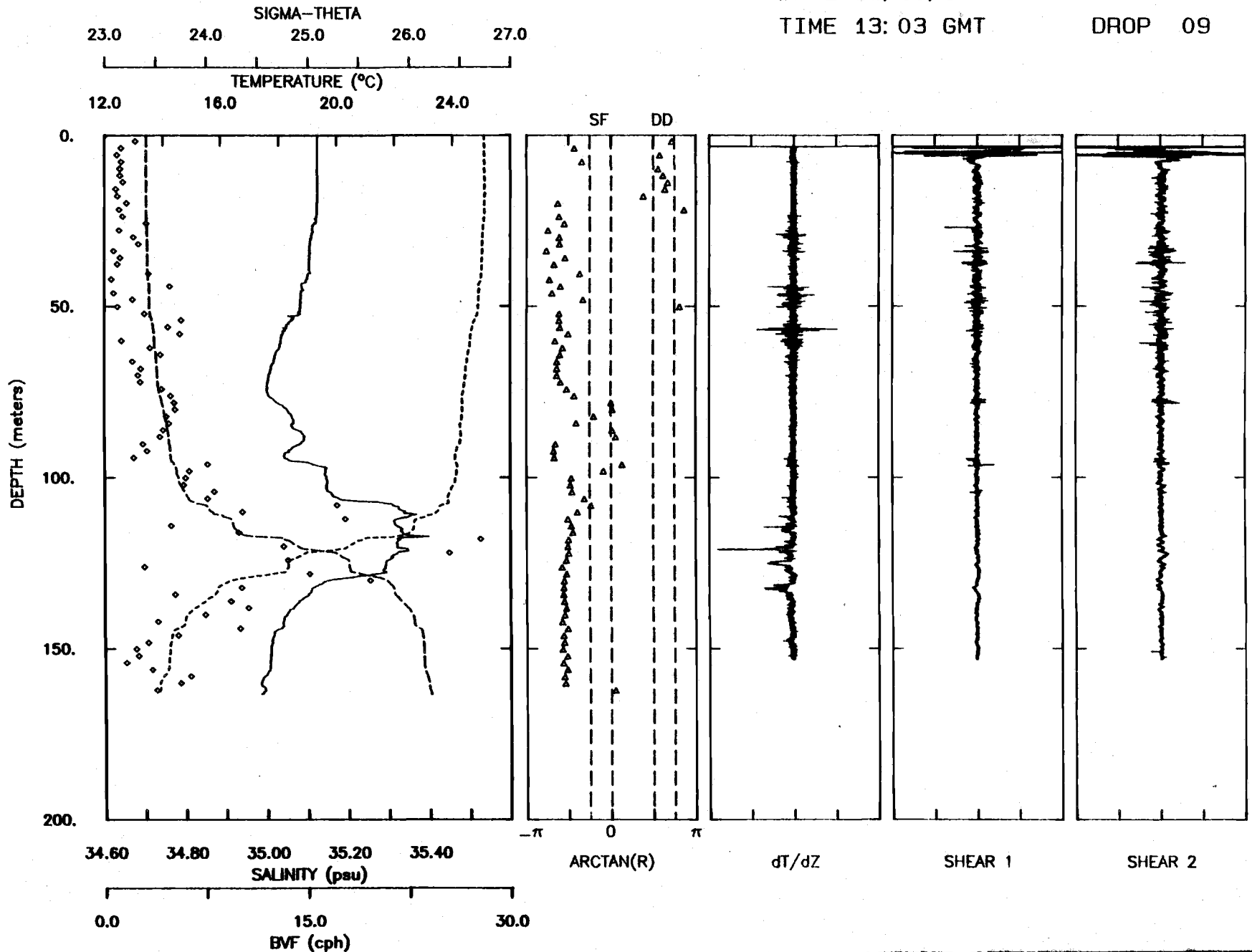


DATE 11/18/84

TAPE 71

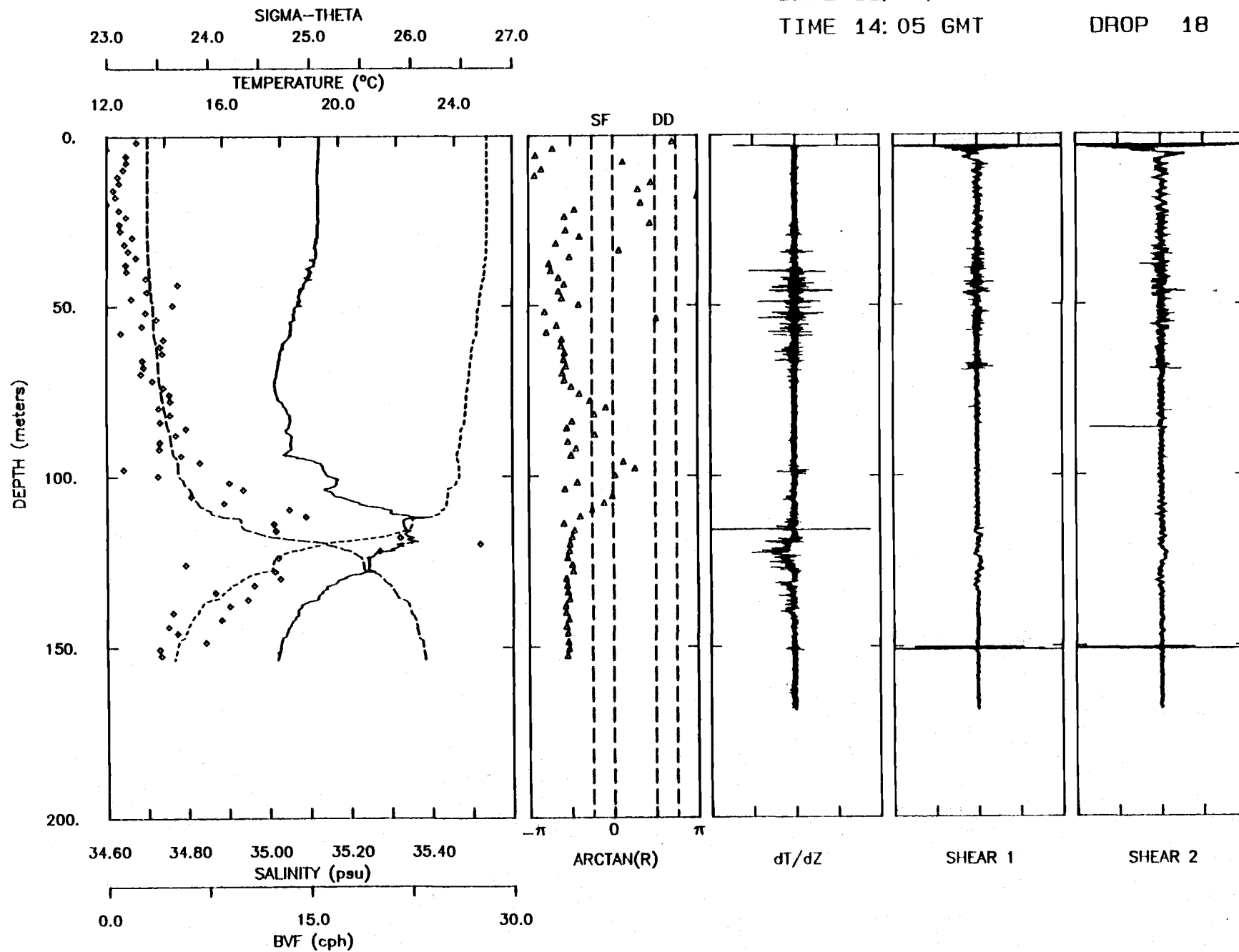
TIME 13:03 GMT

DROP 09



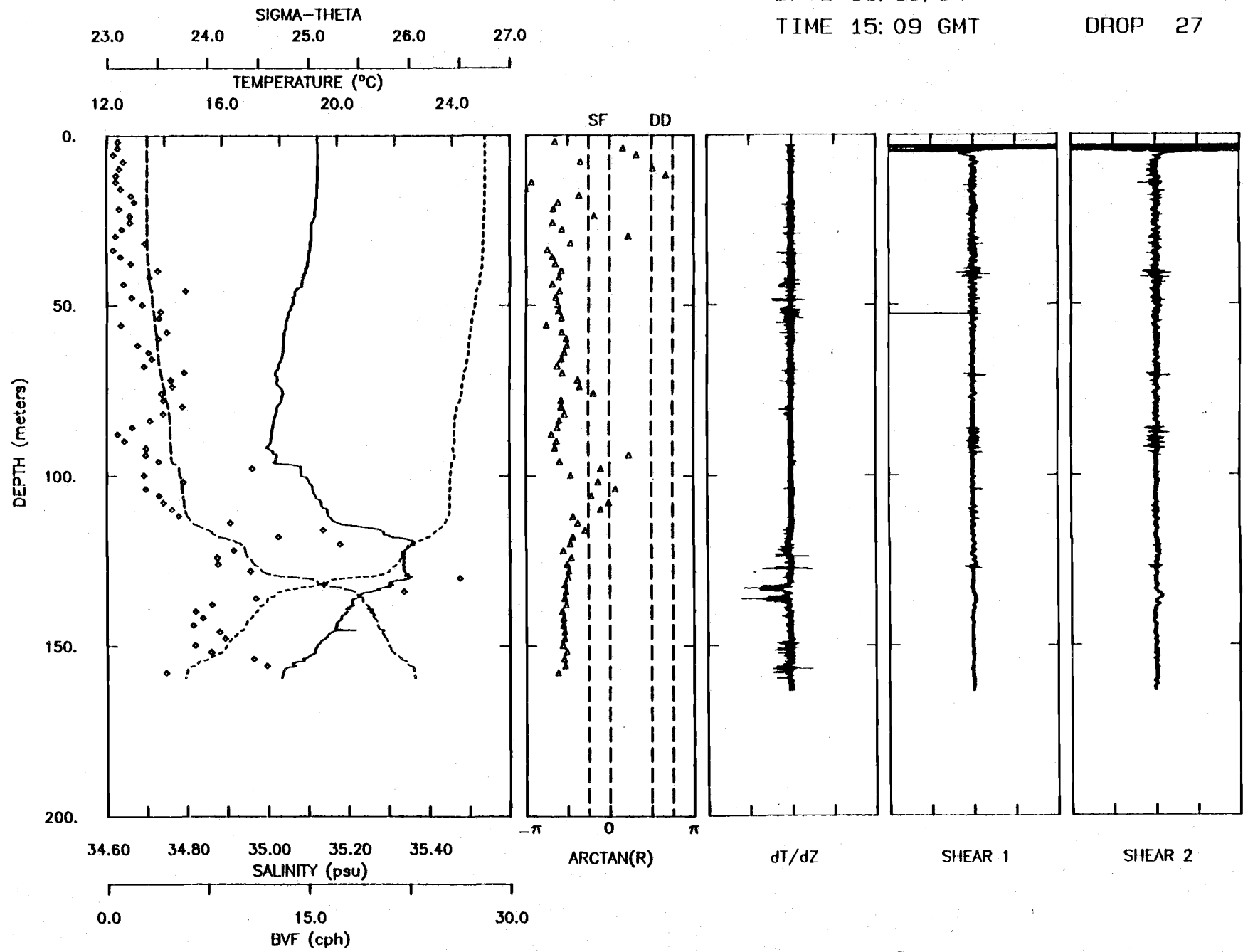
DATE 11/18/84
TIME 14:05 GMT

TAPE 71
DROP 18



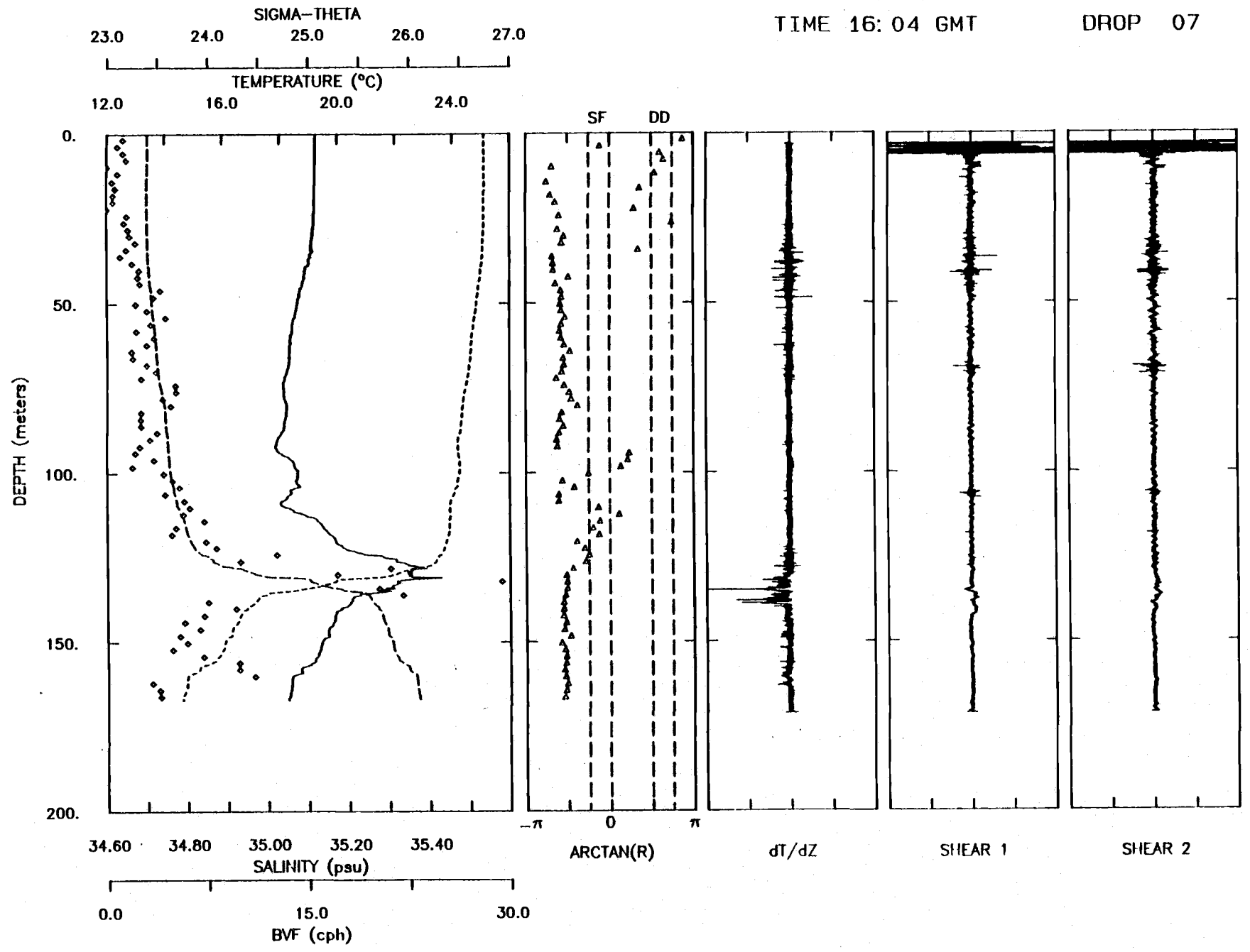
DATE 11/18/84
TIME 15:09 GMT

TAPE 71
DROP 27



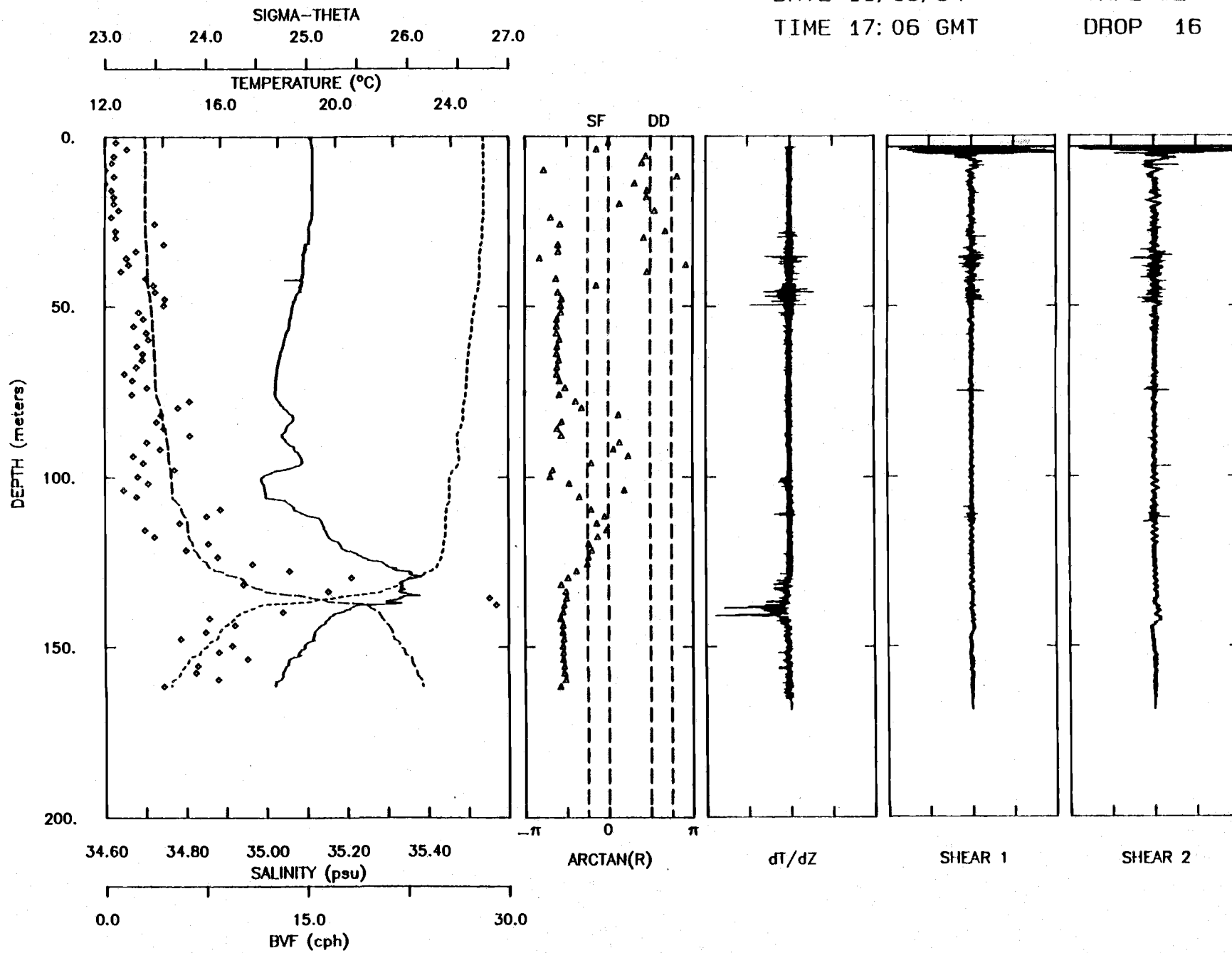
DATE 11/18/84
TIME 16:04 GMT

TAPE 72
DROP 07



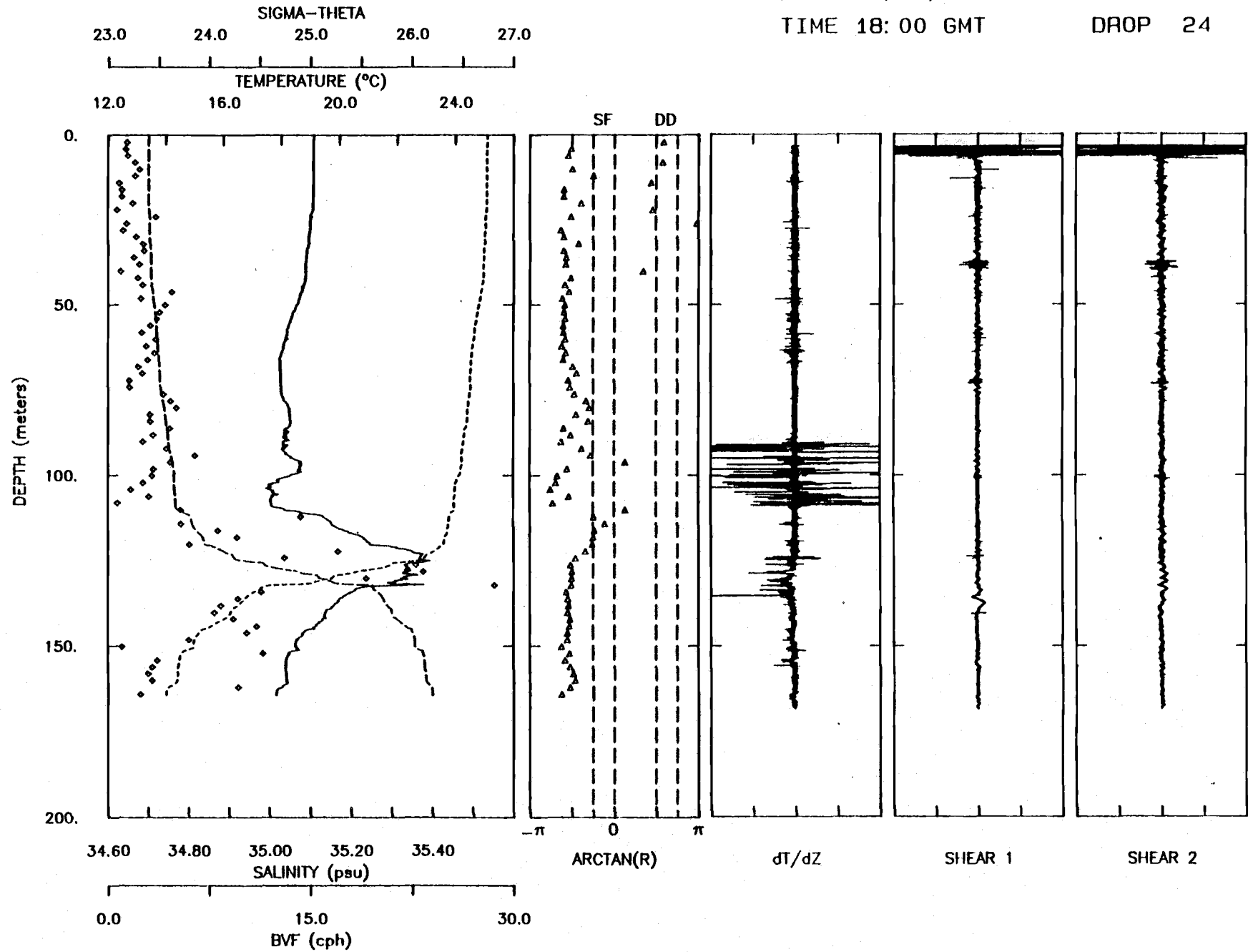
DATE 11/18/84
TIME 17:06 GMT

TAPE 72
DROP 16



DATE 11/18/84
TIME 18:00 GMT

TAPE 72
DROP 24

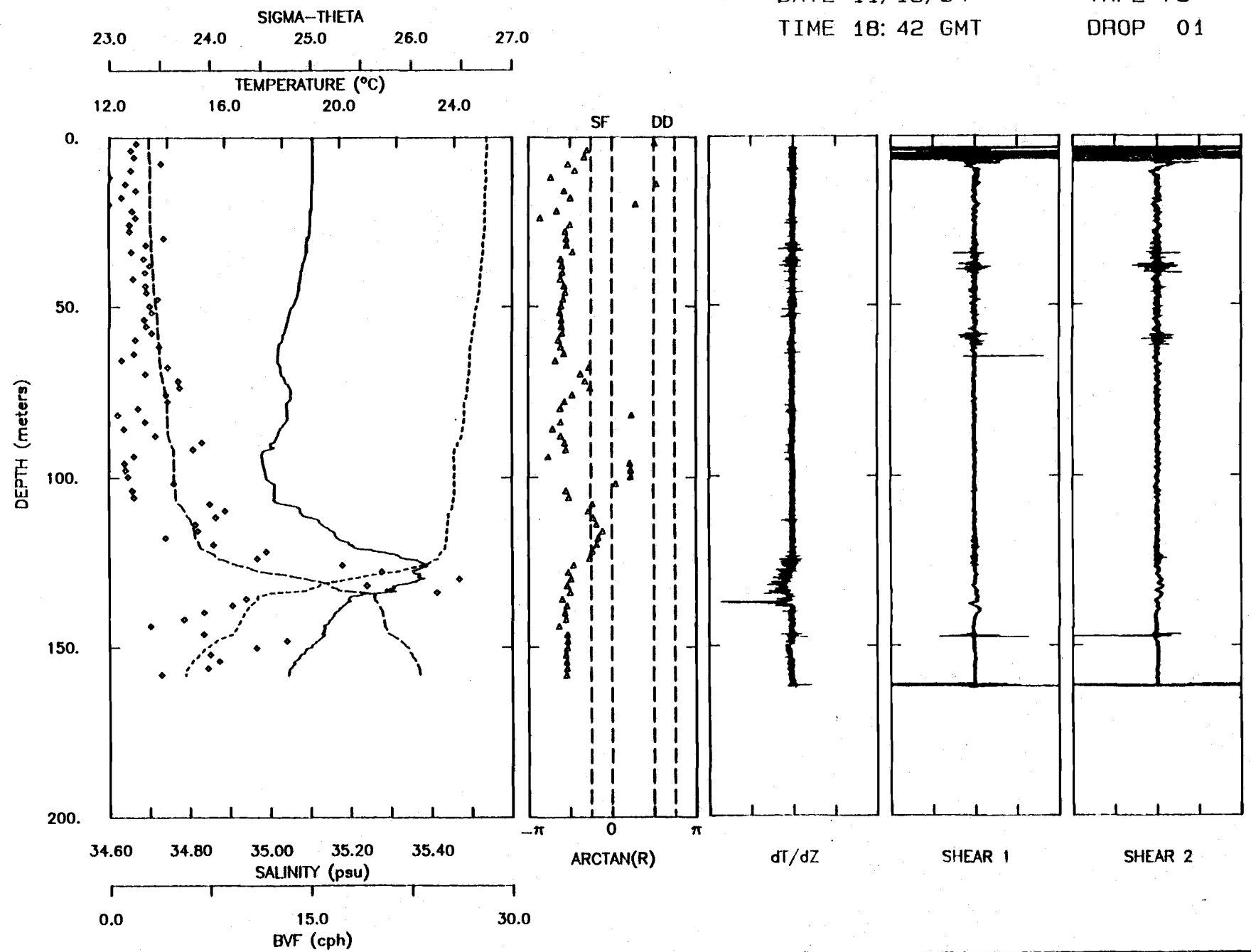


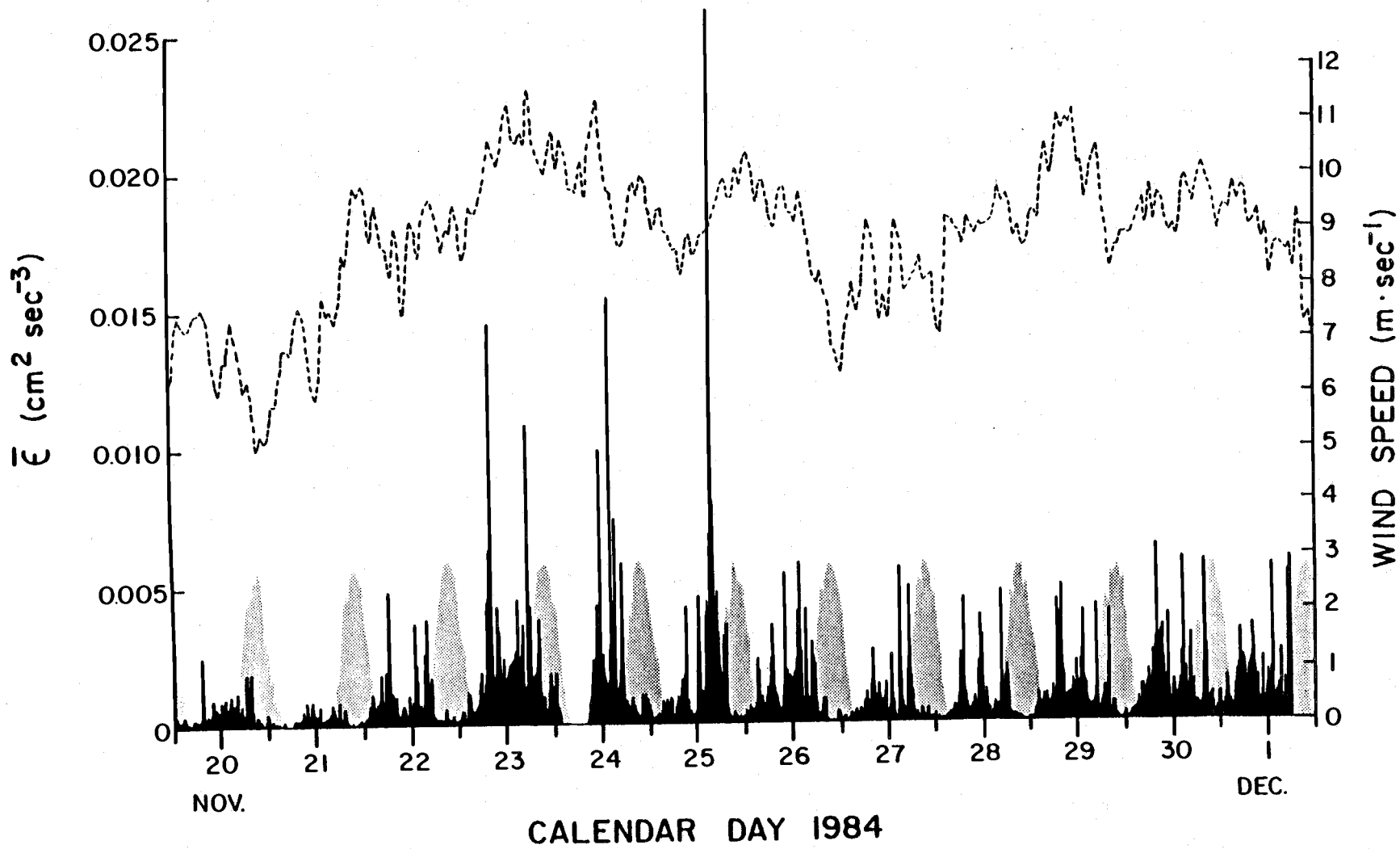
DATE 11/18/84

TAPE 73

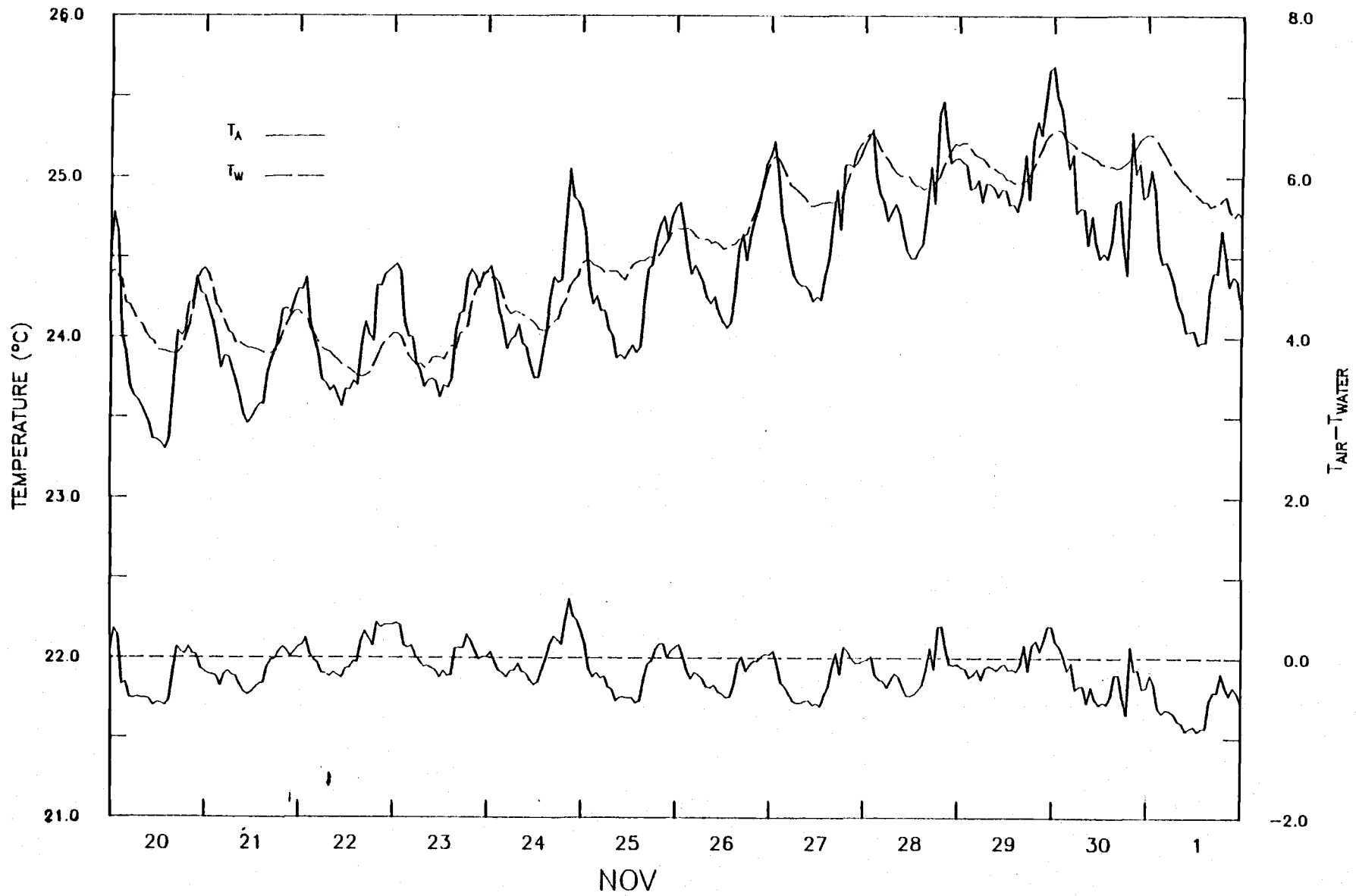
TIME 18:42 GMT

DROP 01

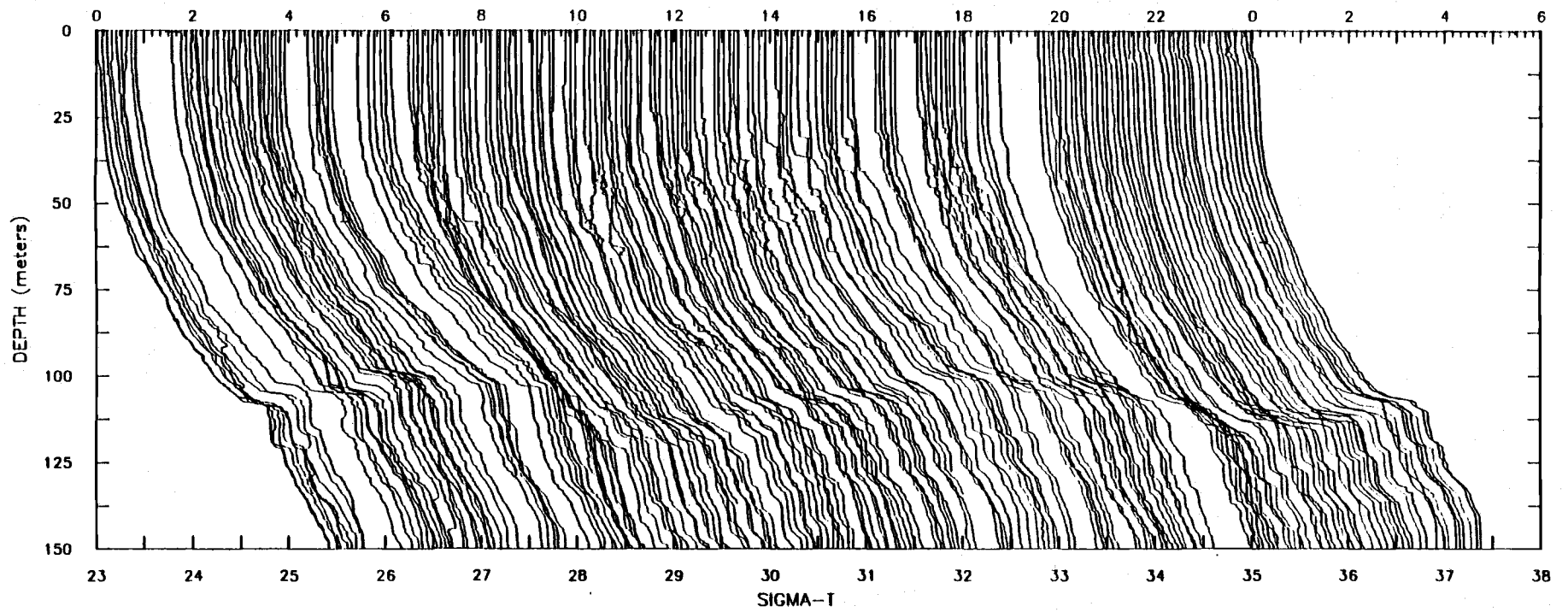




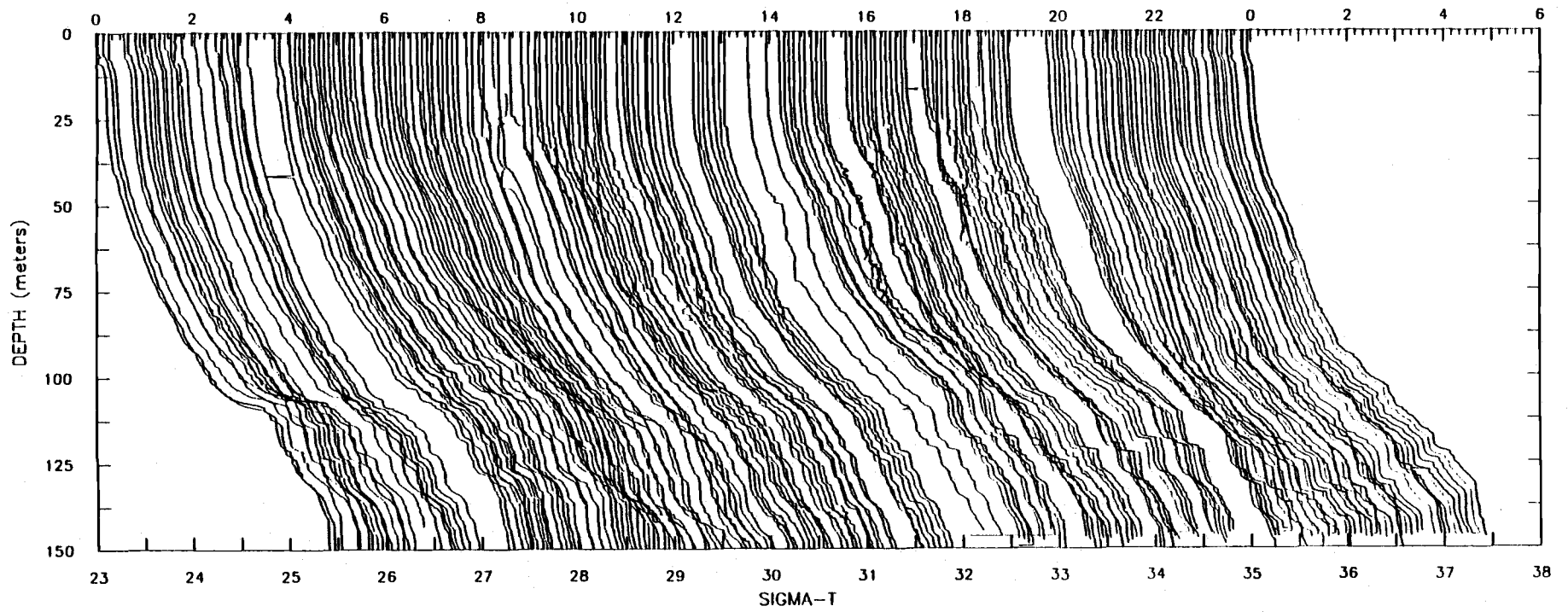
TROPIC HEAT AIR-WATER TEMPERATURE 1984



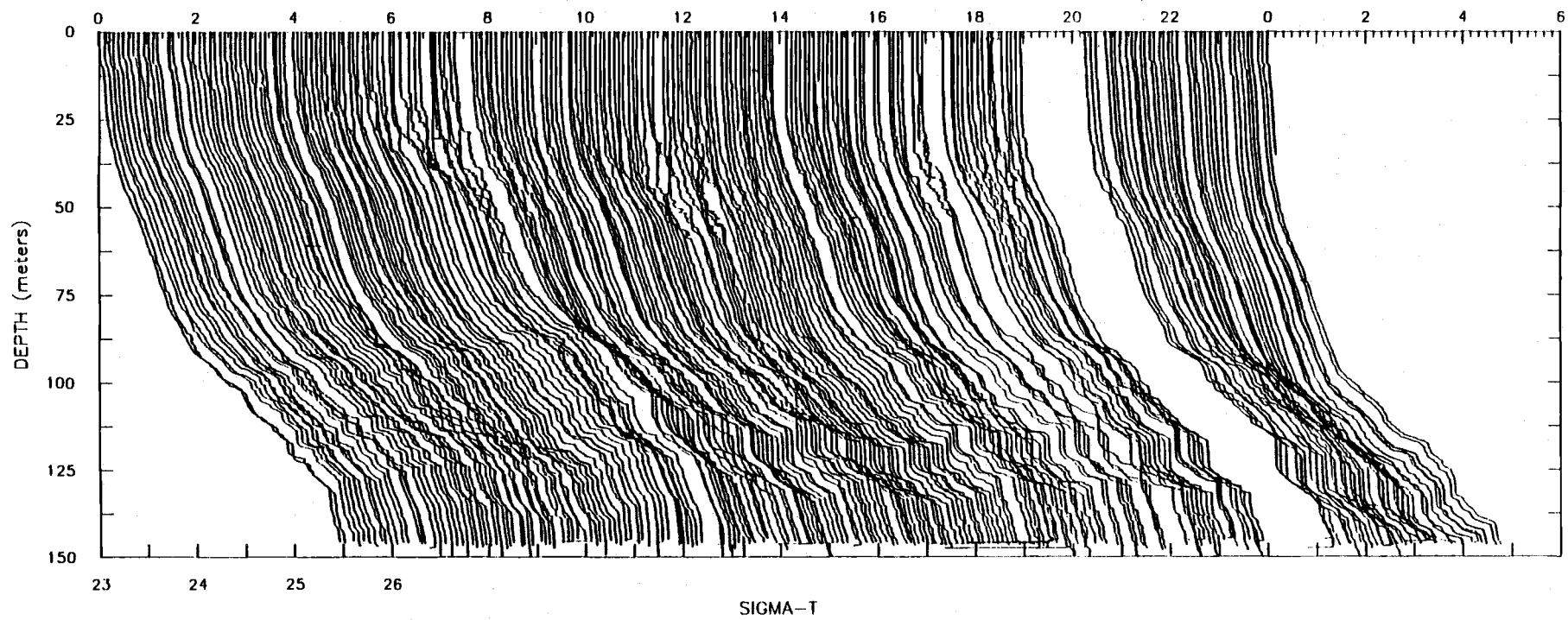
November 26, 1984



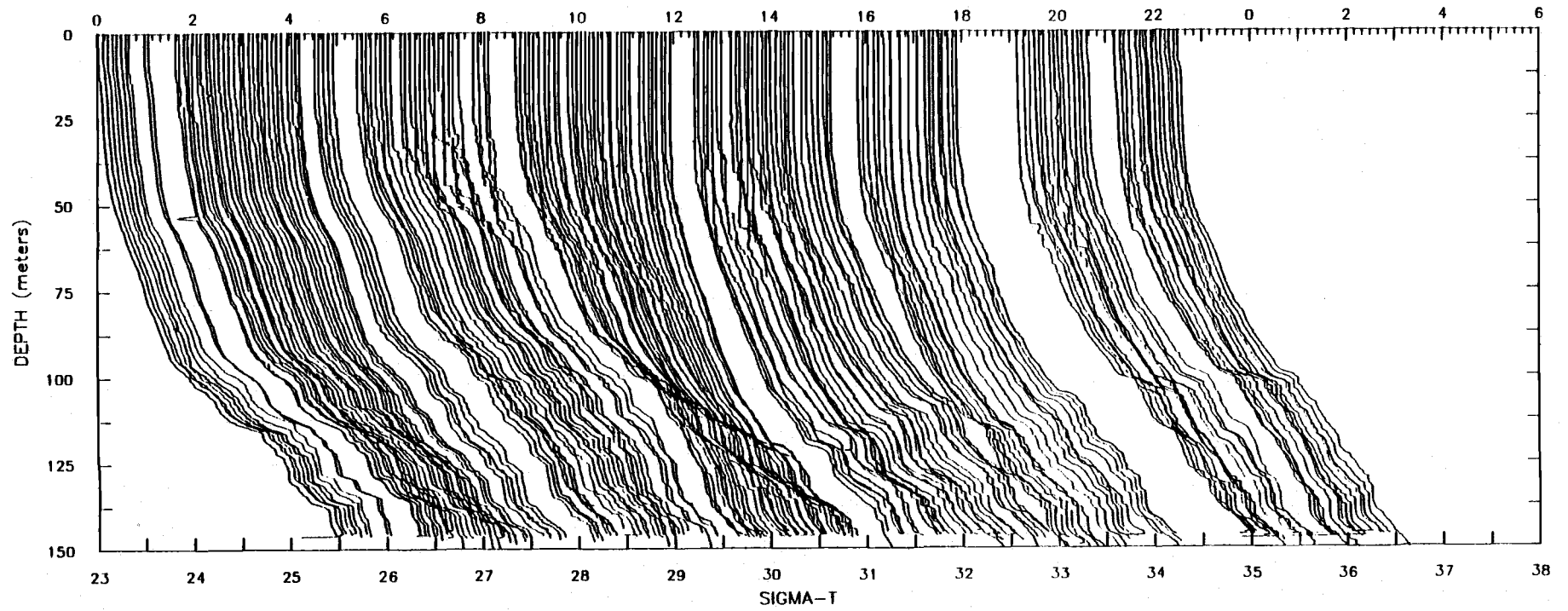
November 27, 1984



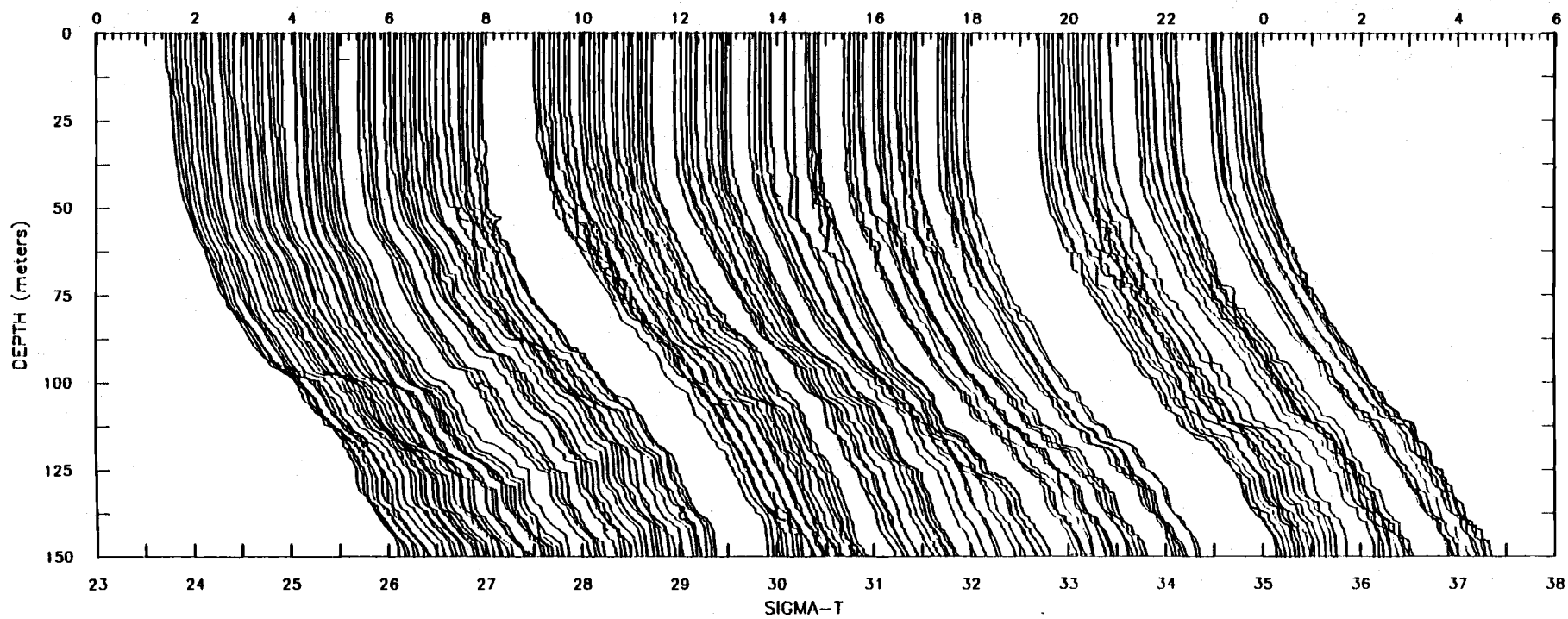
November 28, 1984



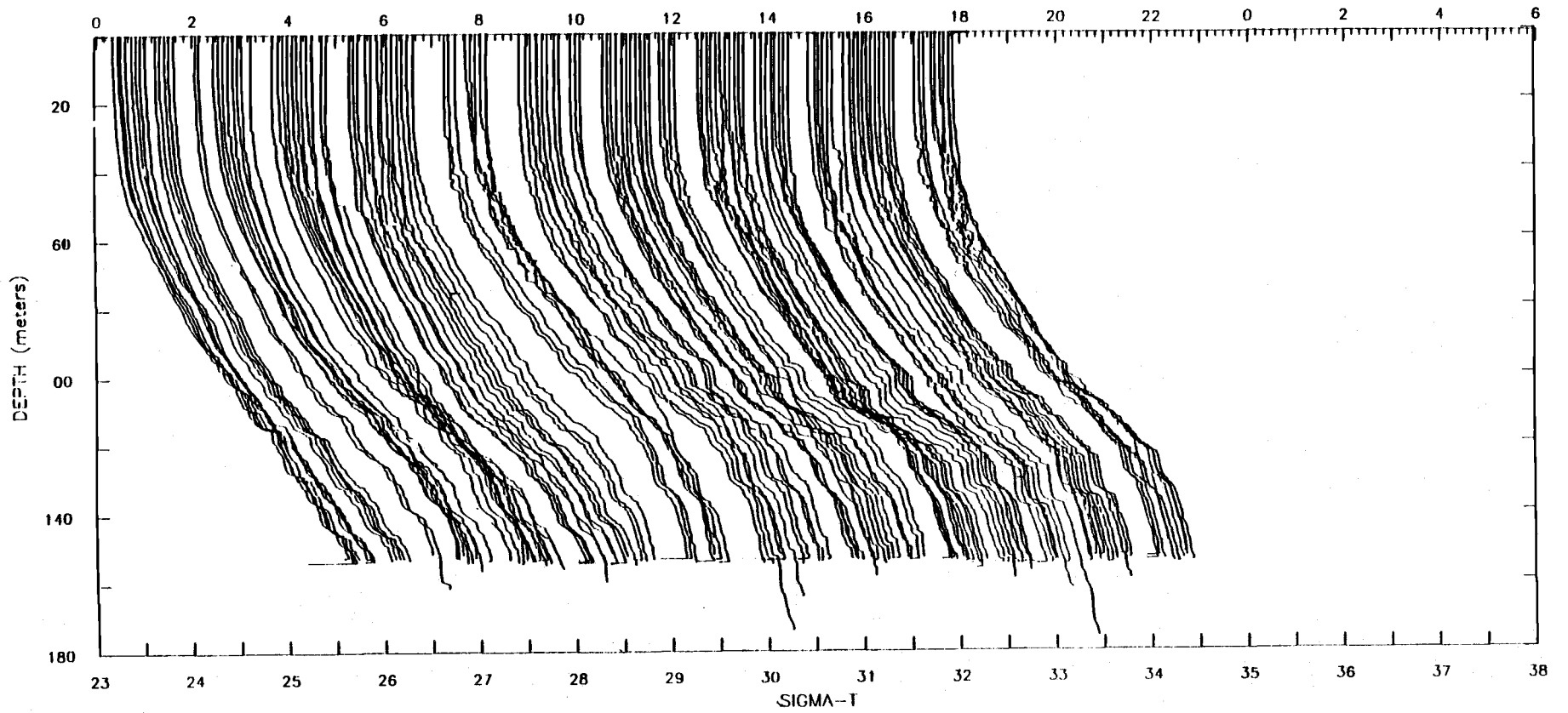
November 29, 1984

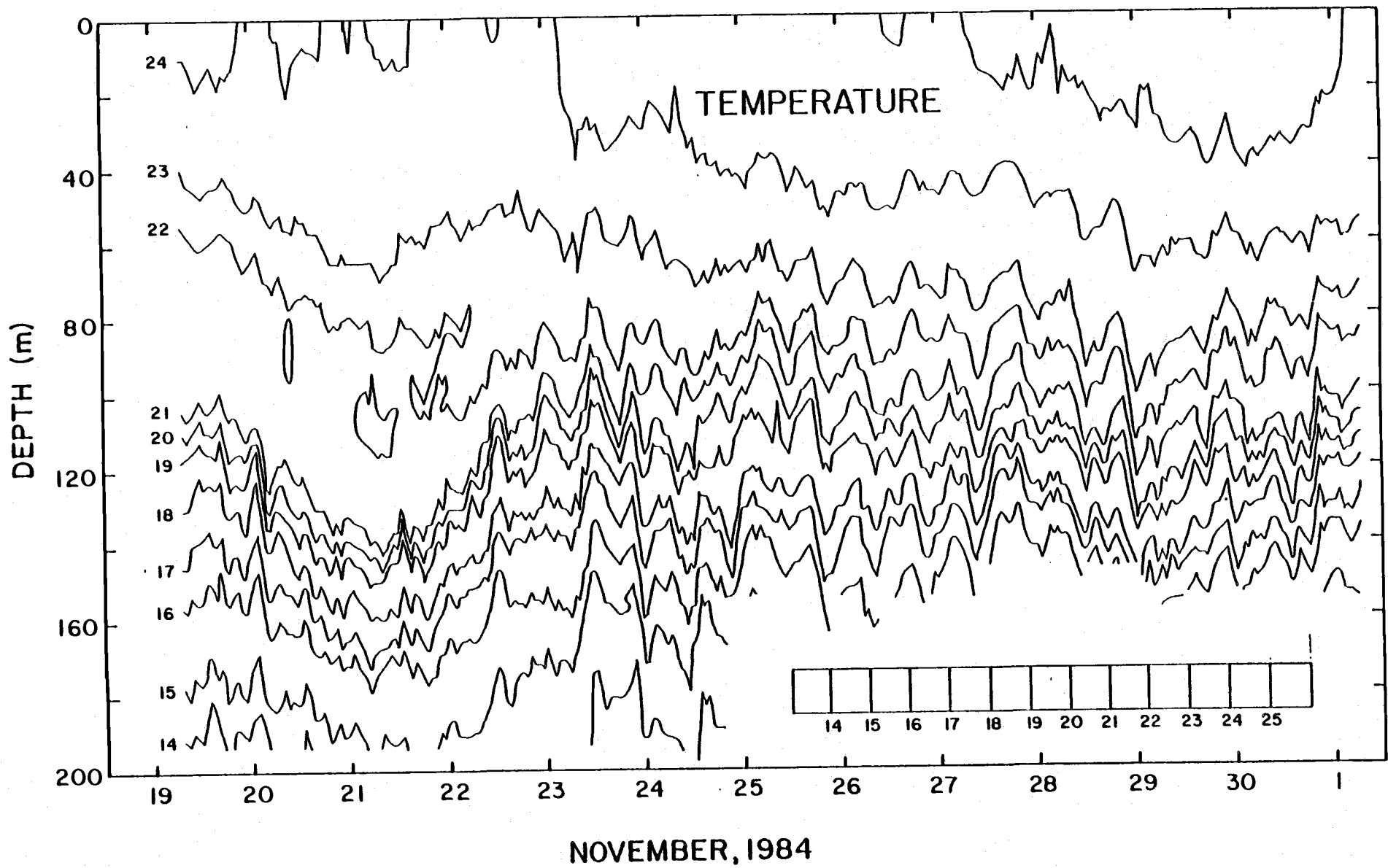


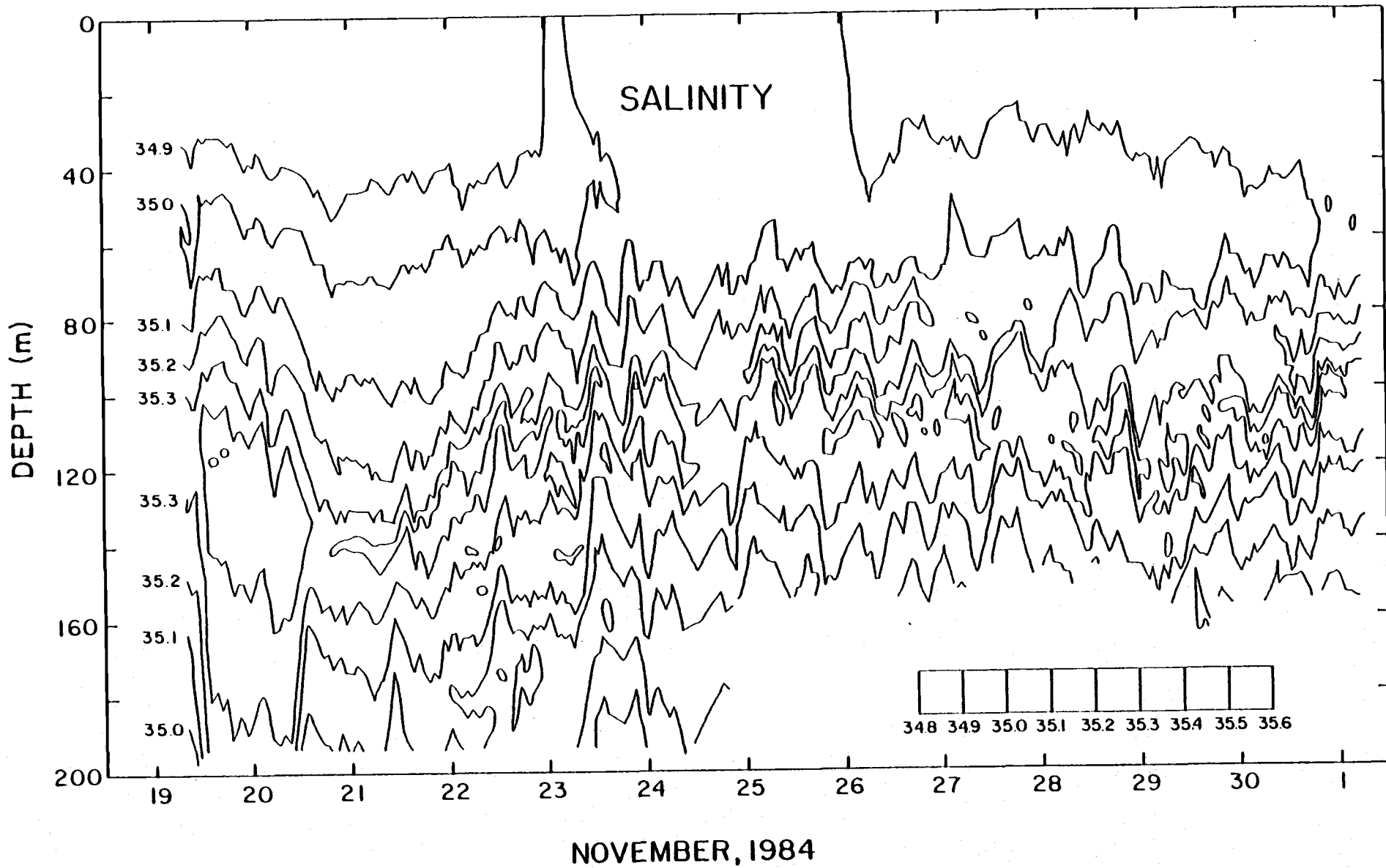
November 30, 1984

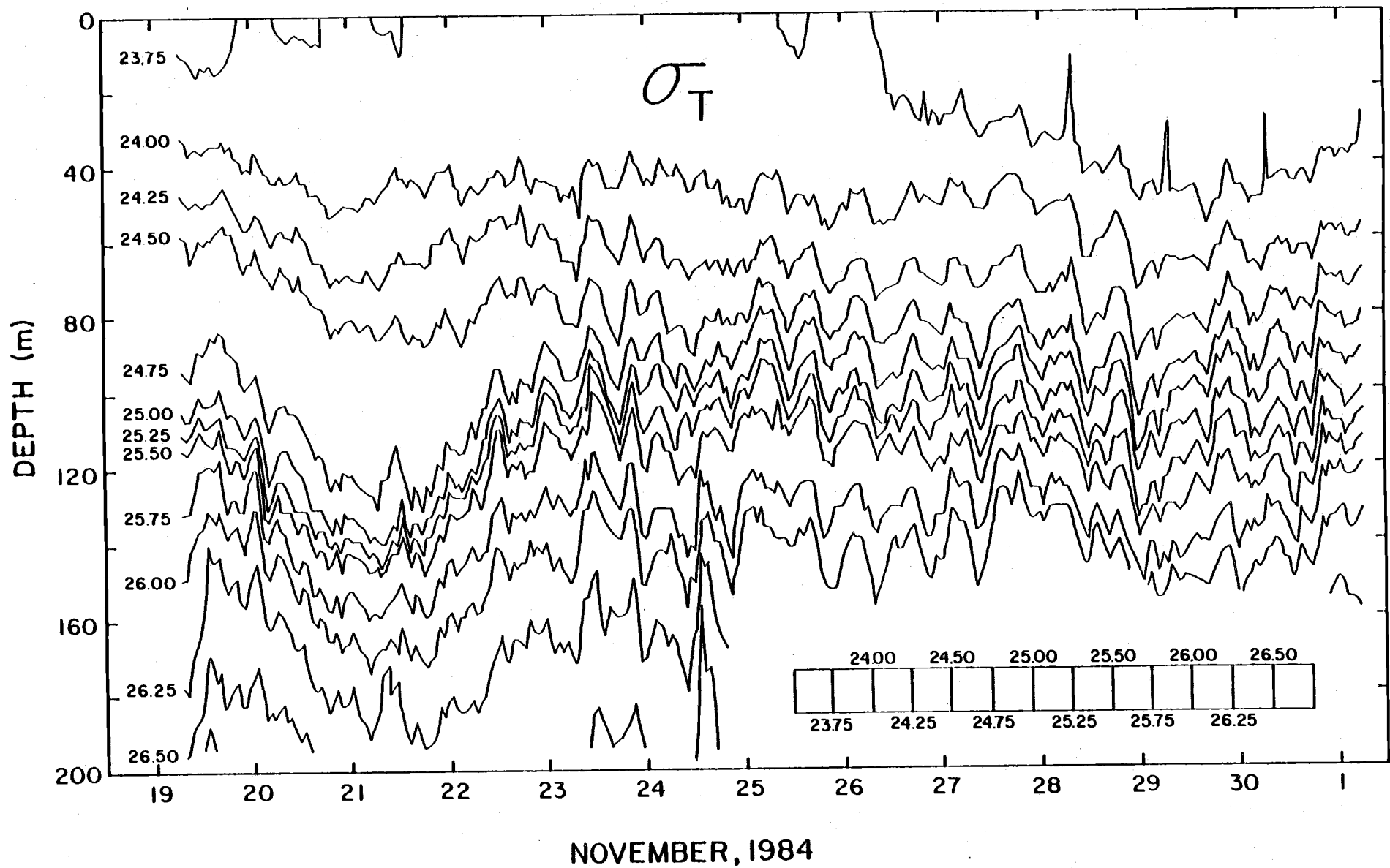


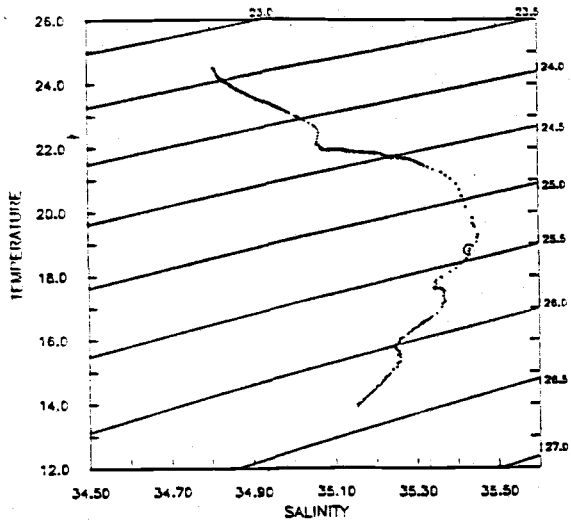
DECEMBER 1, 1984



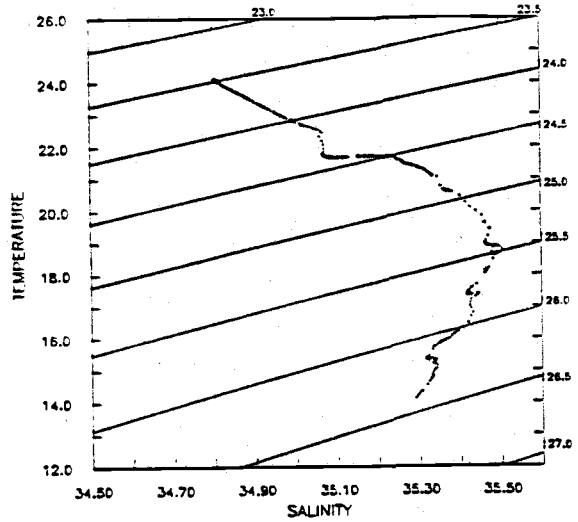




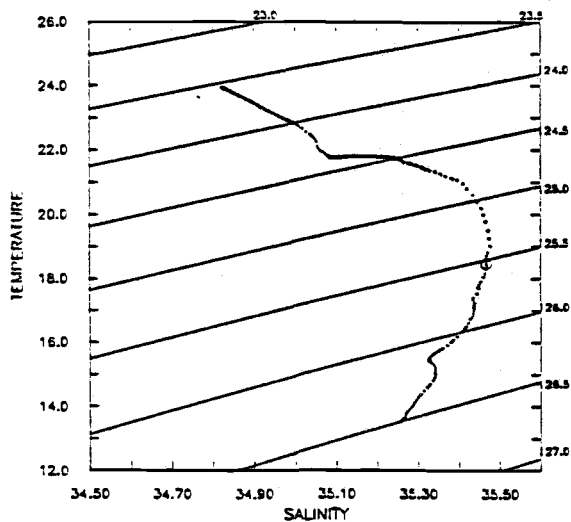




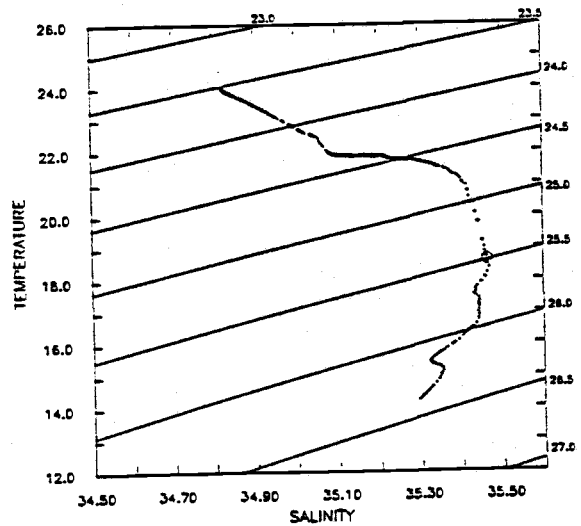
00:30 11/20/84 GMT



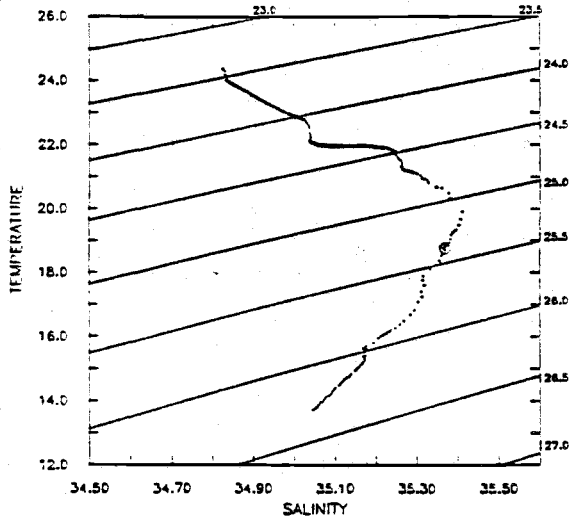
06:30 11/20/84 GMT



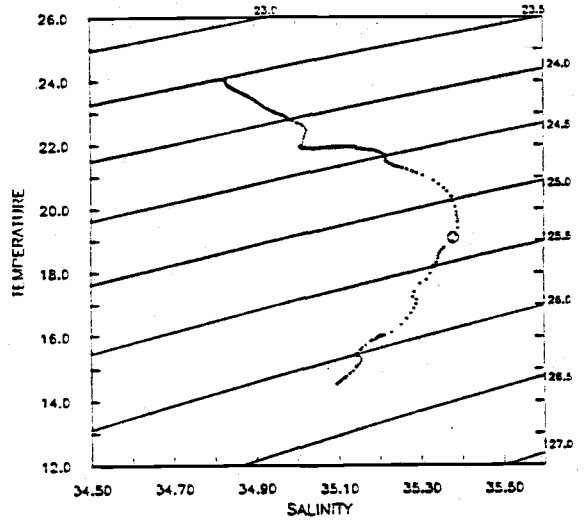
12:30 11/20/84 GMT



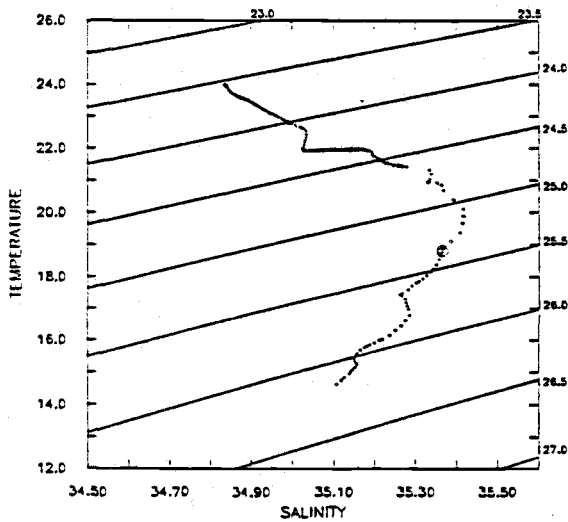
18:30 11/20/84 GMT



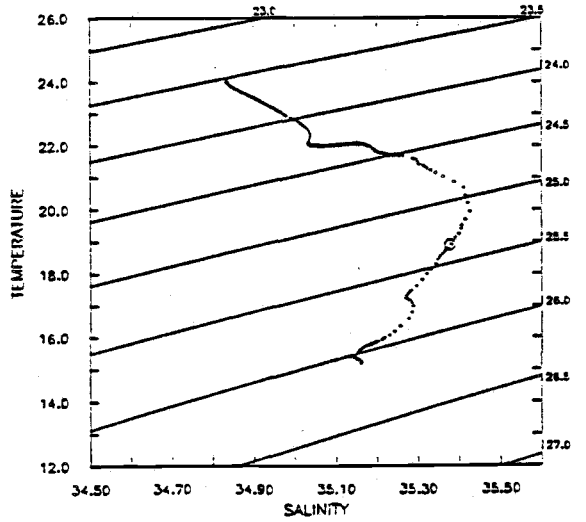
01:30 11/21/84 GMT



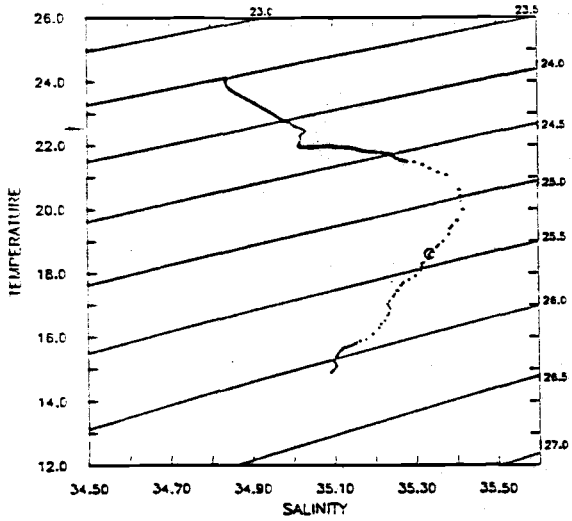
06:30 11/21/84 GMT



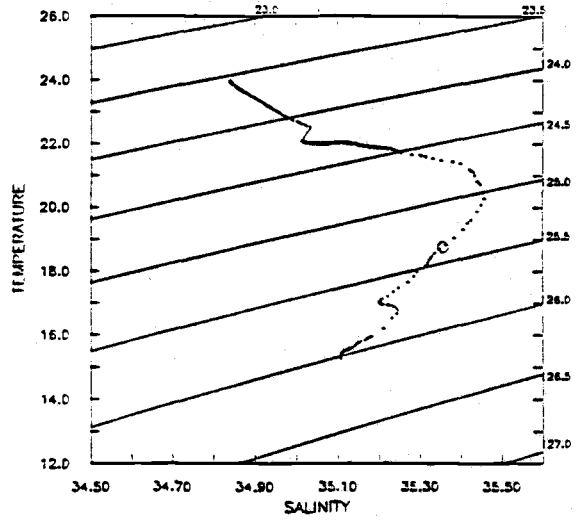
12:30 11/21/84 GMT



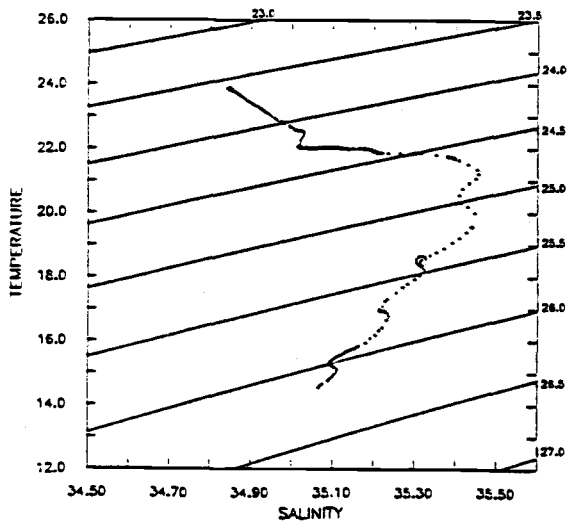
18:30 11/21/84 GMT



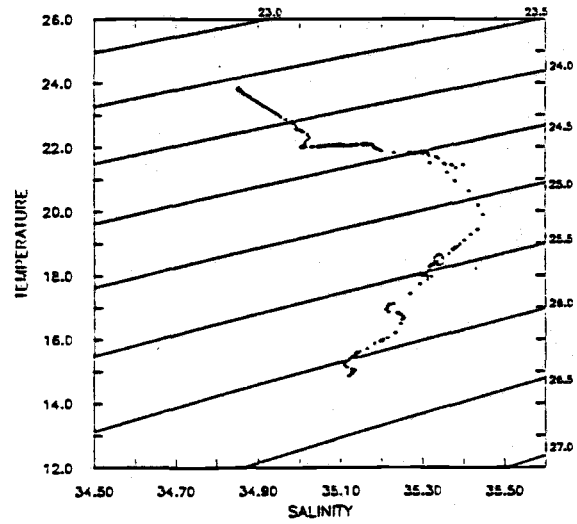
01:30 11/22/84 GMT



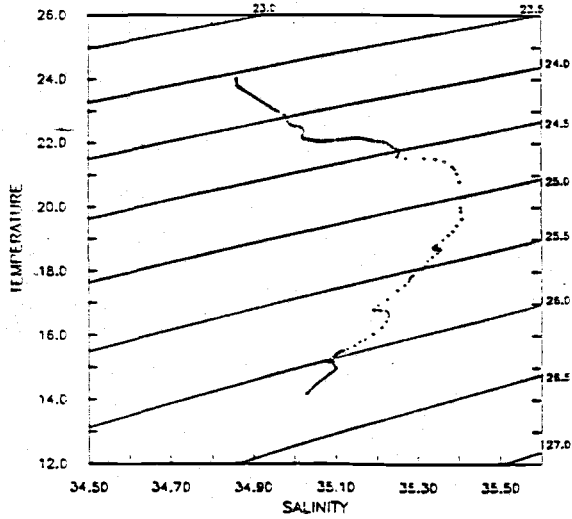
06:30 11/22/84 GMT



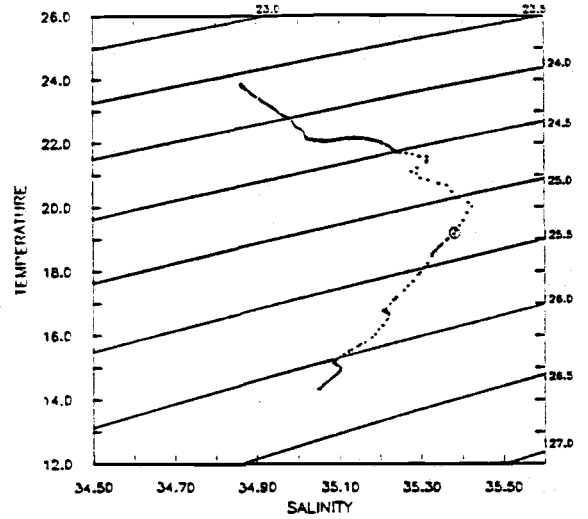
12:30 11/22/84 GMT



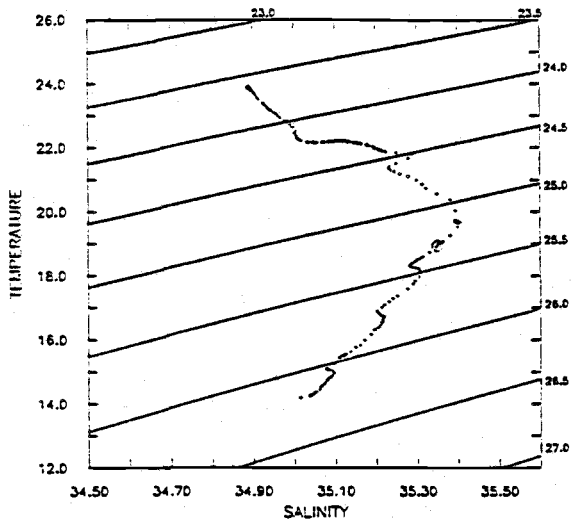
18:30 11/22/84 GMT



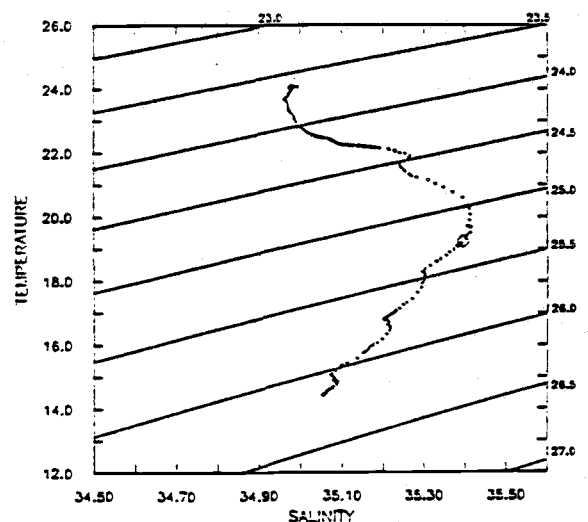
00:30 11/23/84 GMT



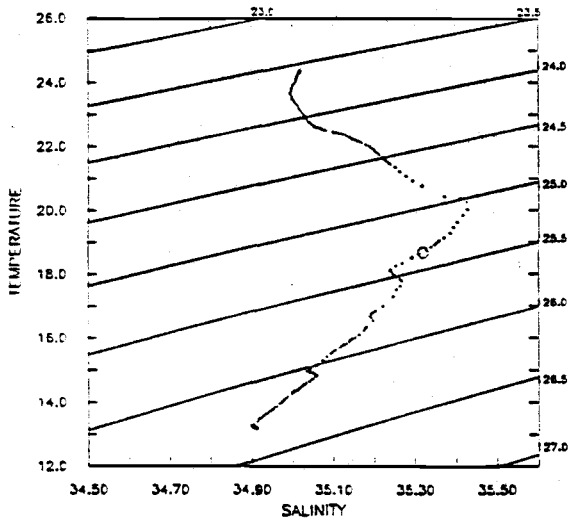
06:30 11/23/84 GMT



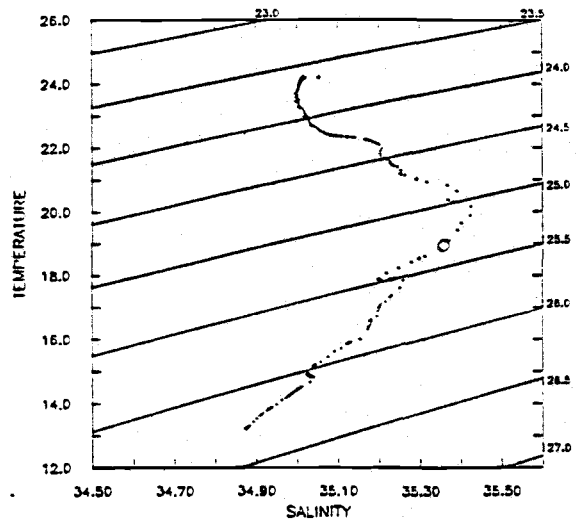
12:30 11/23/84 GMT



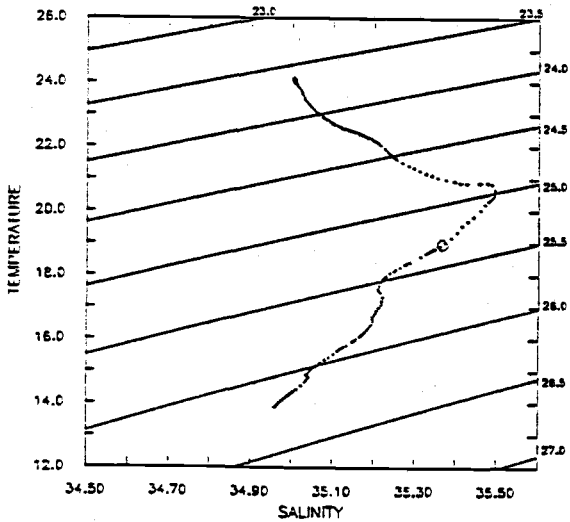
18:30 11/23/84 GMT



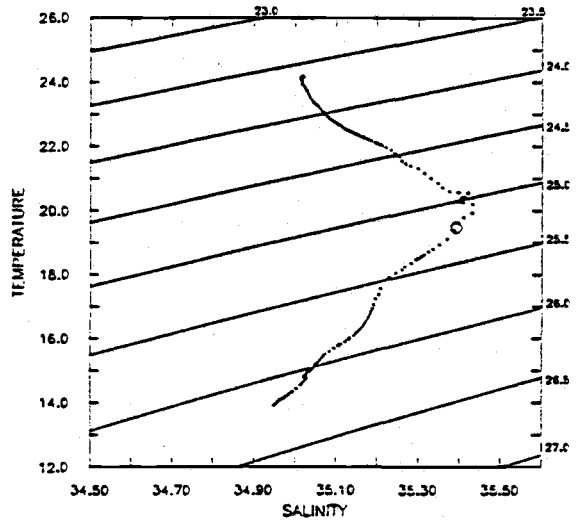
00:30 11/24/84 GMT



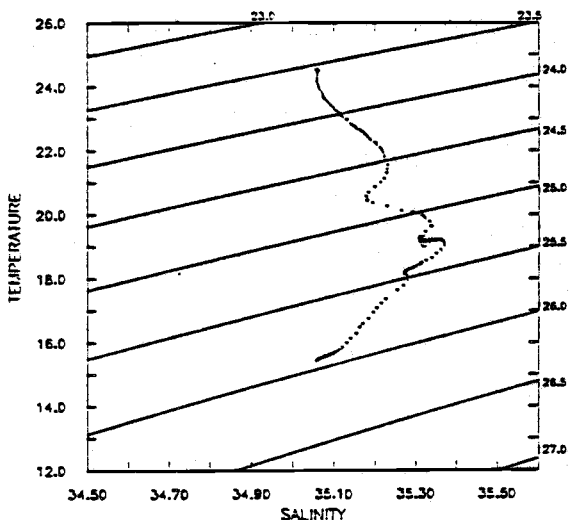
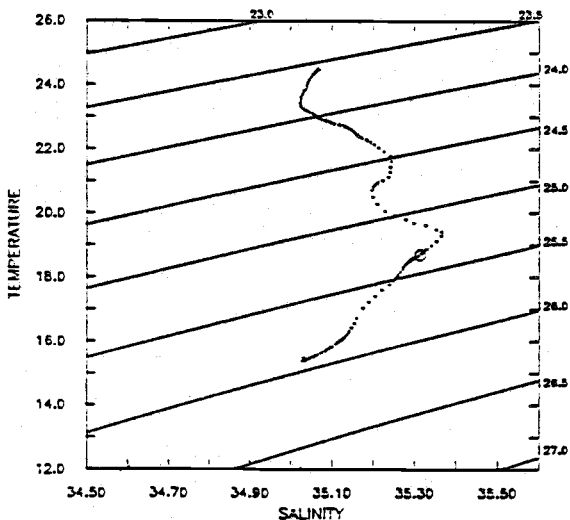
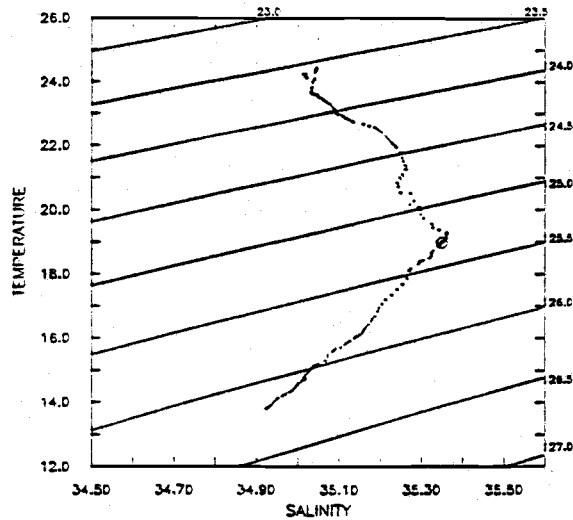
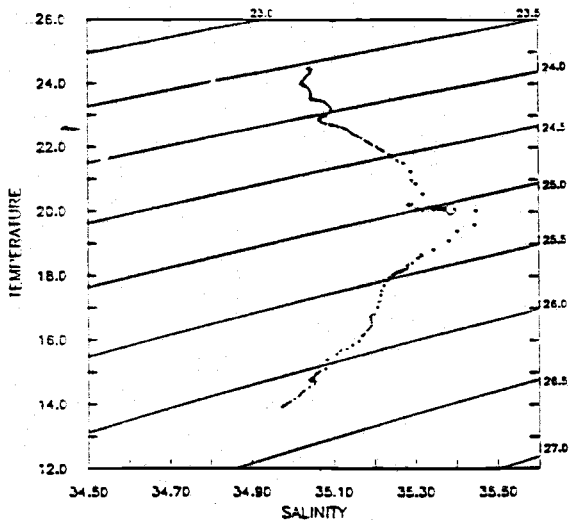
06:30 11/24/84 GMT

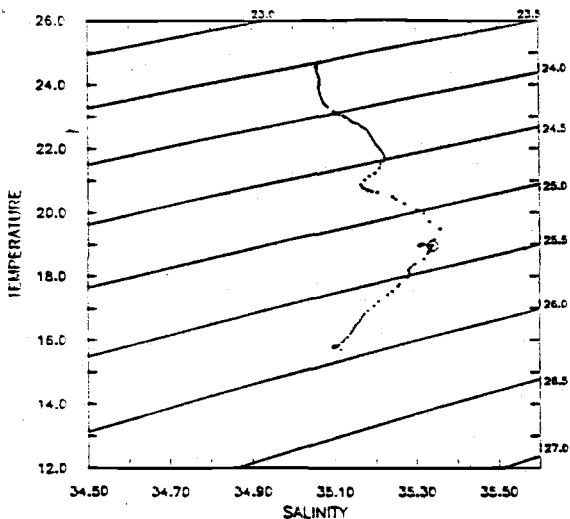


12:30 11/24/84 GMT

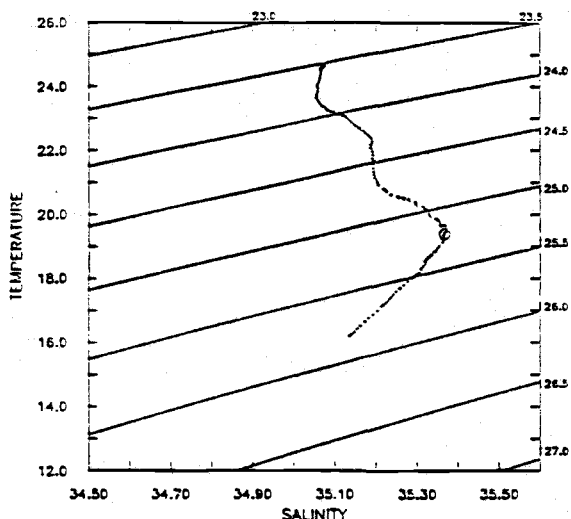


18:30 11/24/84 GMT

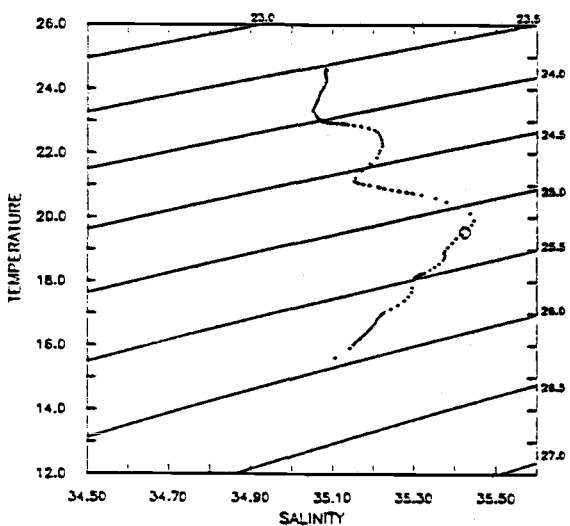




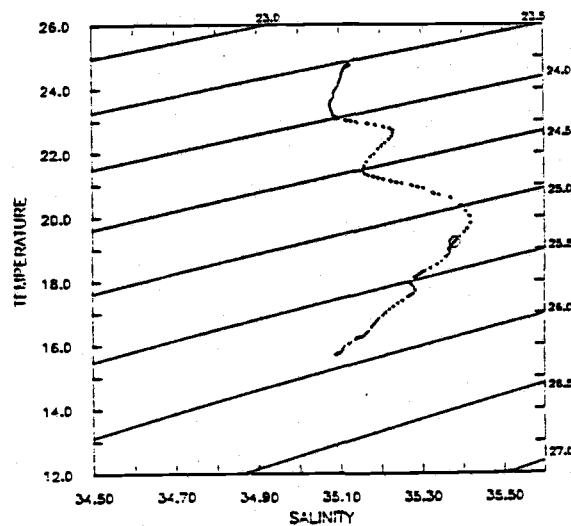
00:30 11/26/84 GMT



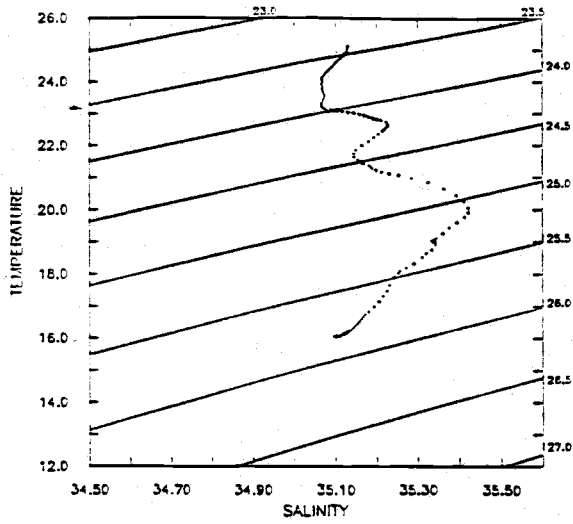
06:30 11/26/84 GMT



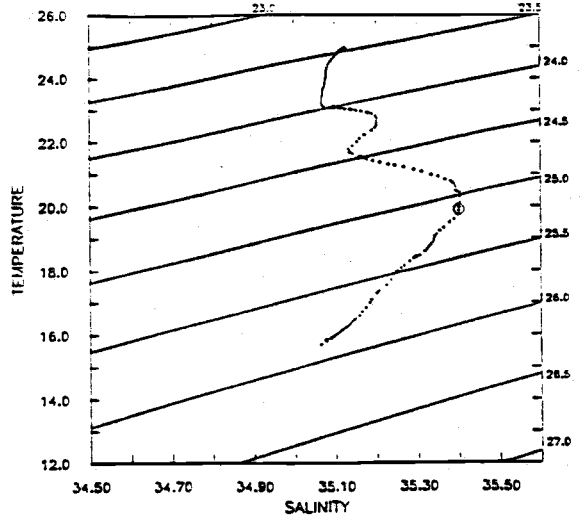
12:30 11/26/84 GMT



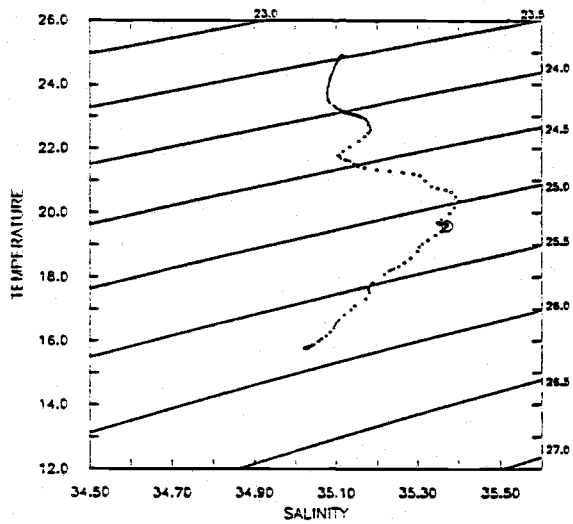
18:30 11/26/84 GMT



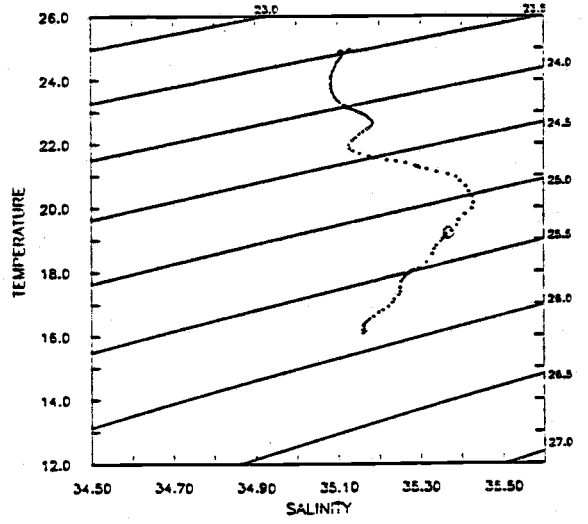
00:30 11/27/84 GMT



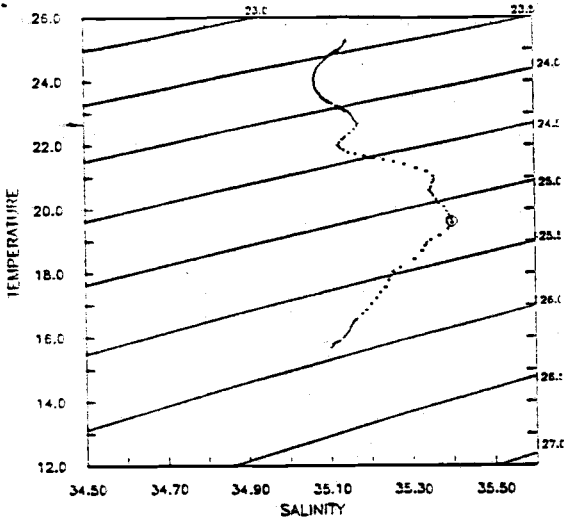
06:30 11/27/84 GMT



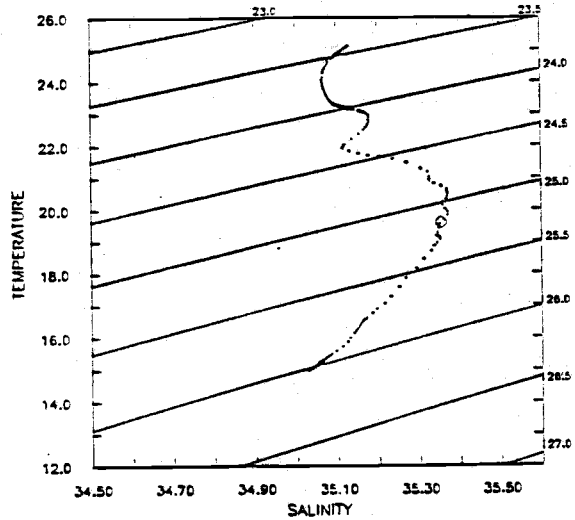
12:30 11/27/84 GMT



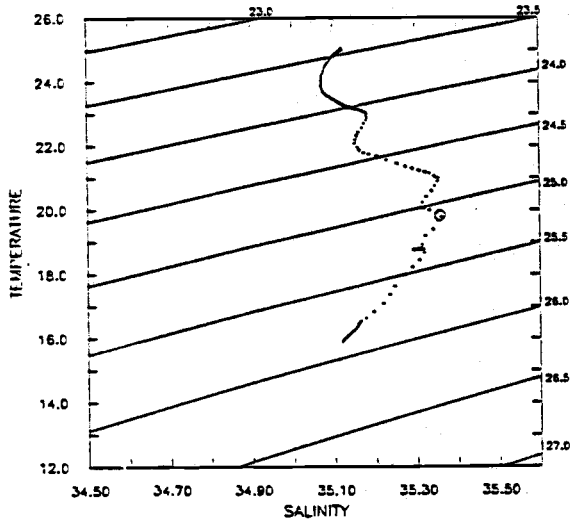
18:30 11/27/84 GMT



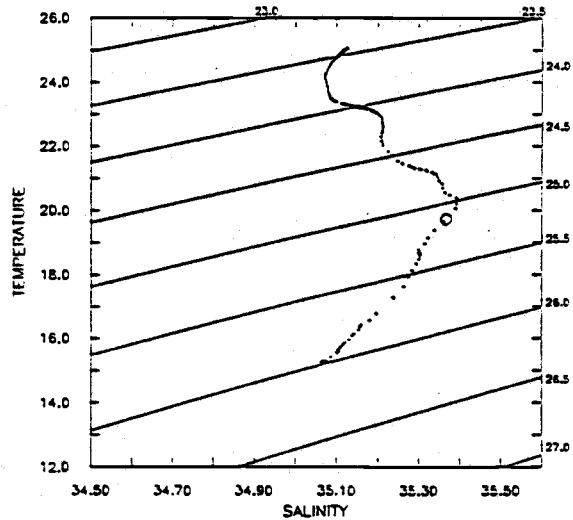
00:30 11/28/84 GMT



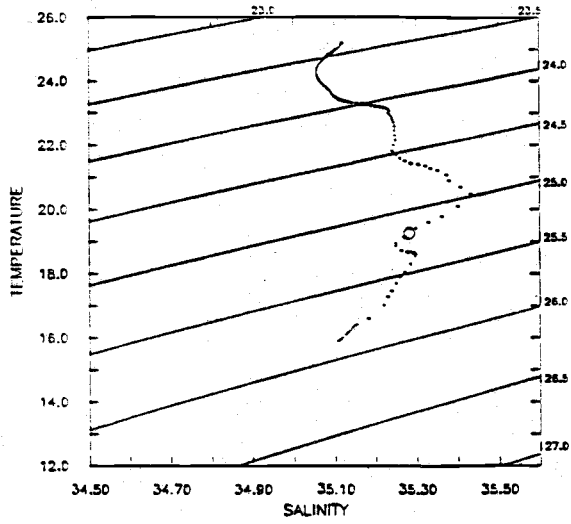
06:30 11/28/84 GMT



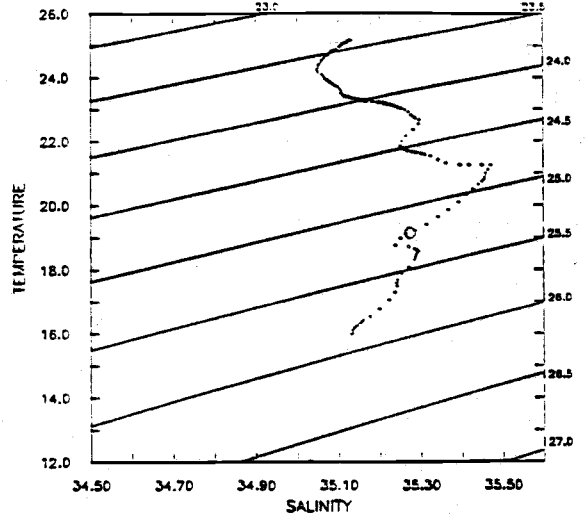
12:30 11/28/84 GMT



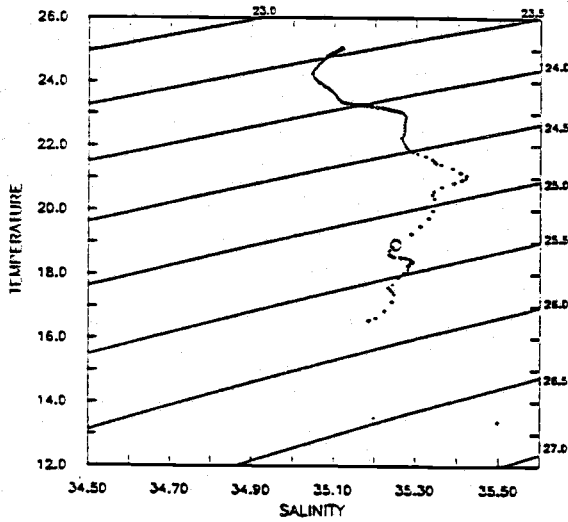
18:30 11/28/84 GMT



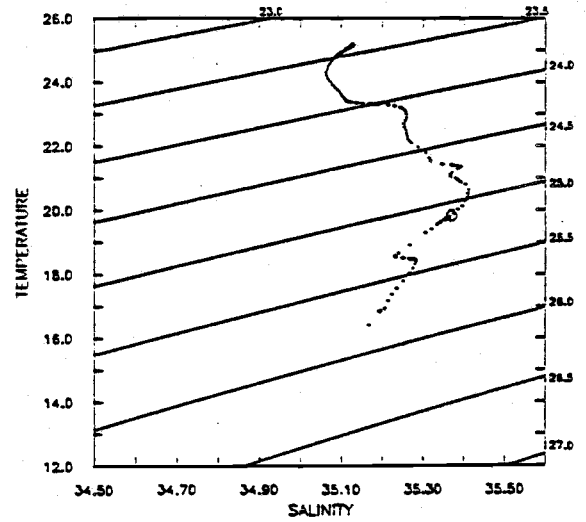
00:30 11/29/84 GMT



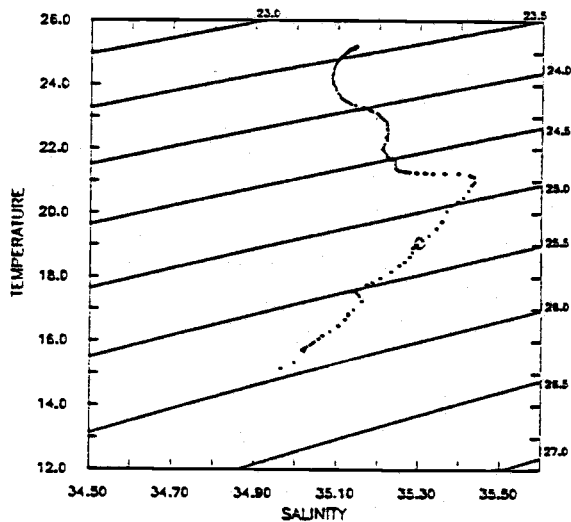
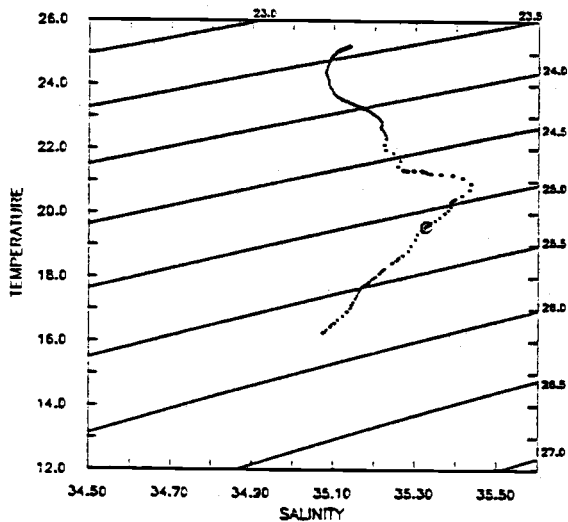
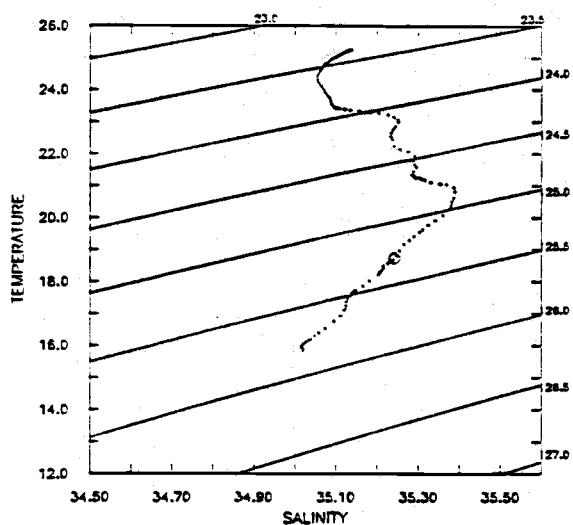
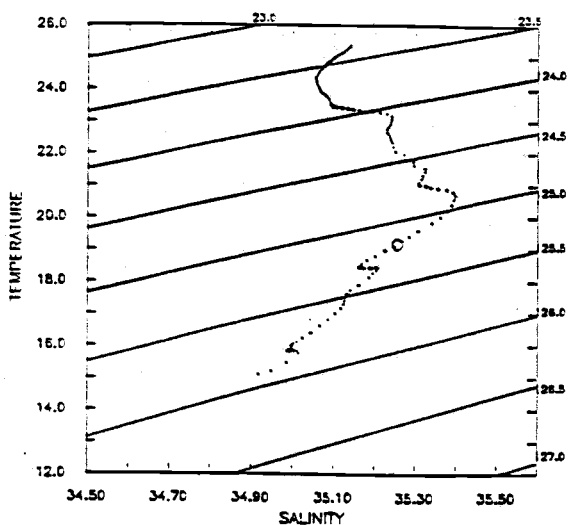
06:30 11/29/84 GMT

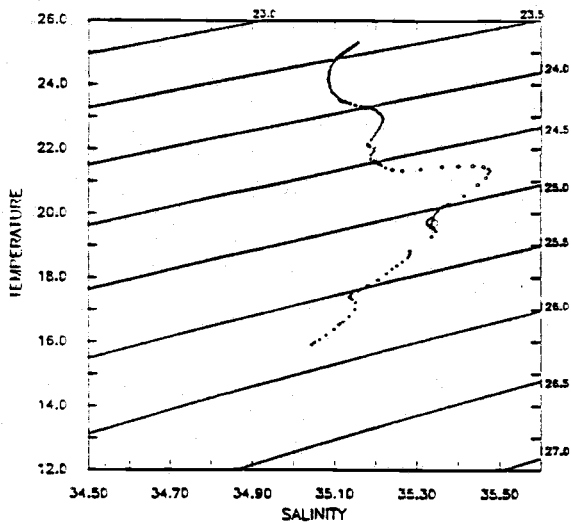


12:30 11/29/84 GMT

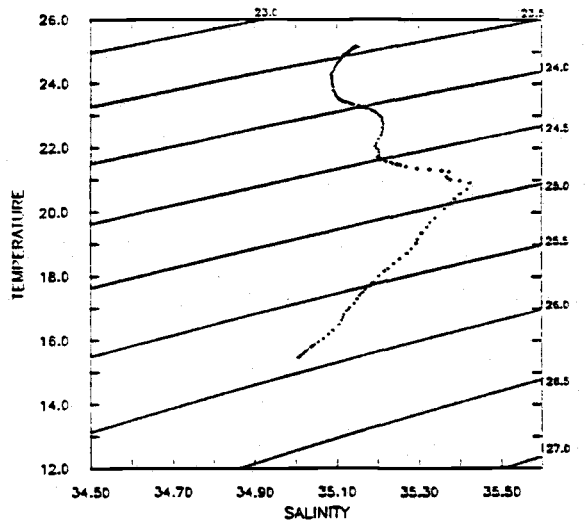


19:30 11/29/84 GMT

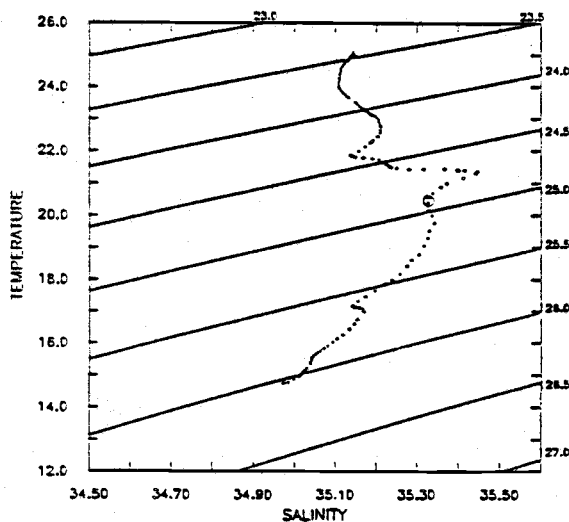




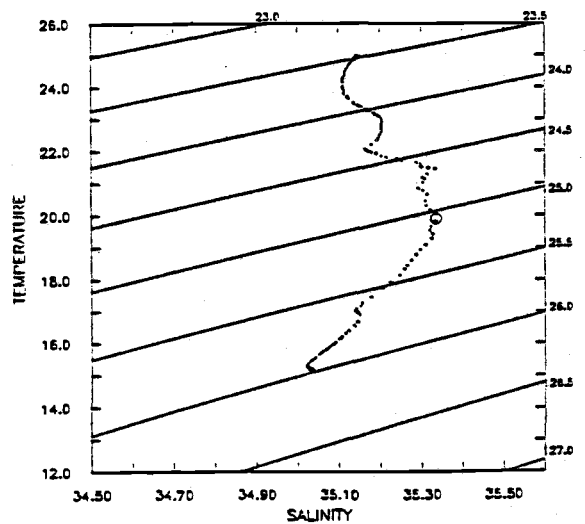
00:30 12/01/84 GMT



06:30 12/01/84 GMT



12:30 12/01/84 GMT

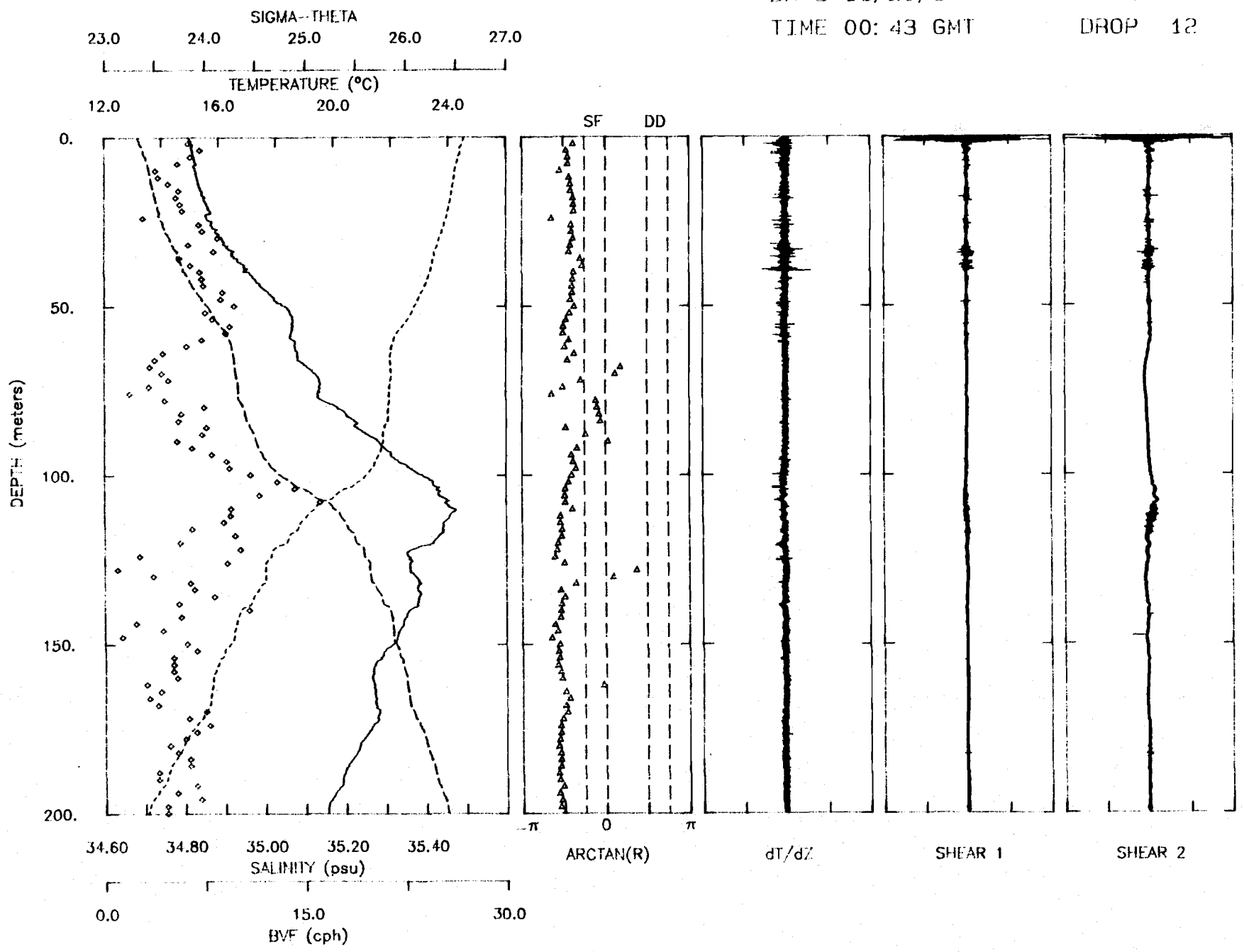


17:30 12/01/84 GMT

The following section contains one plot for every hour that data was collected during the station.

DATE 11/20/84
TIME 00:43 GMT

TAPE 74
DROP 12

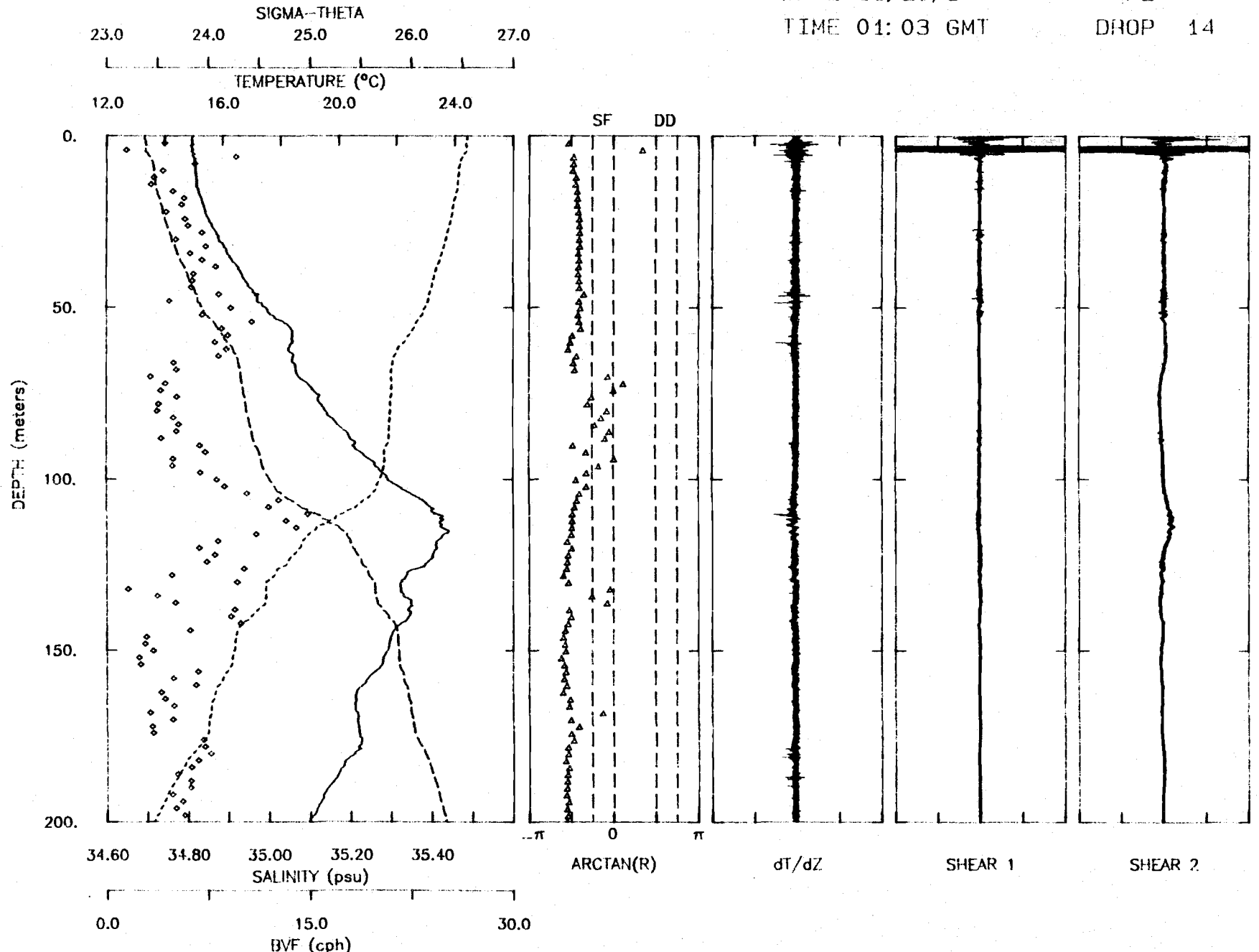


DATE 11/20/84

TAPE 74

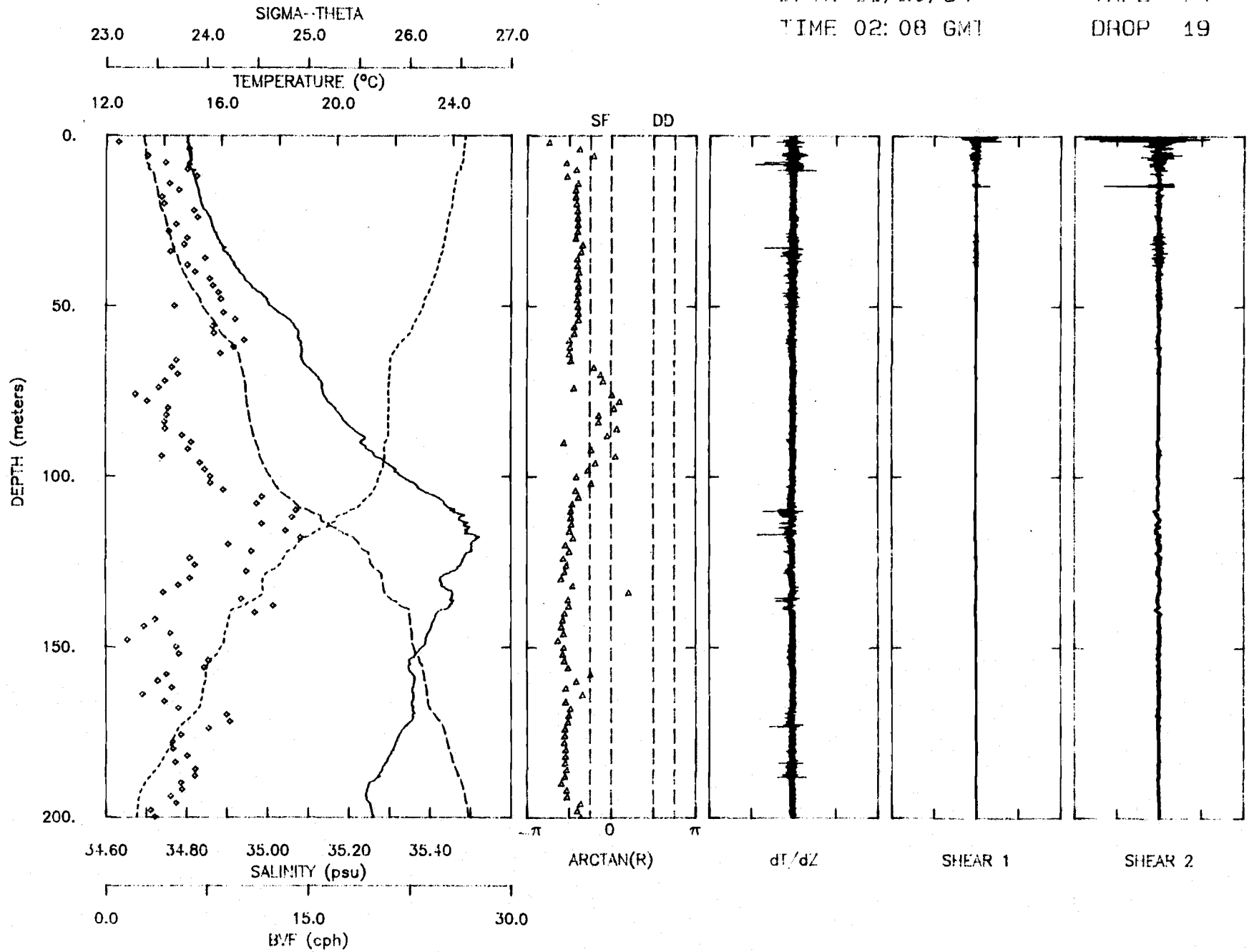
TIME 01:03 GMT

DROP 14



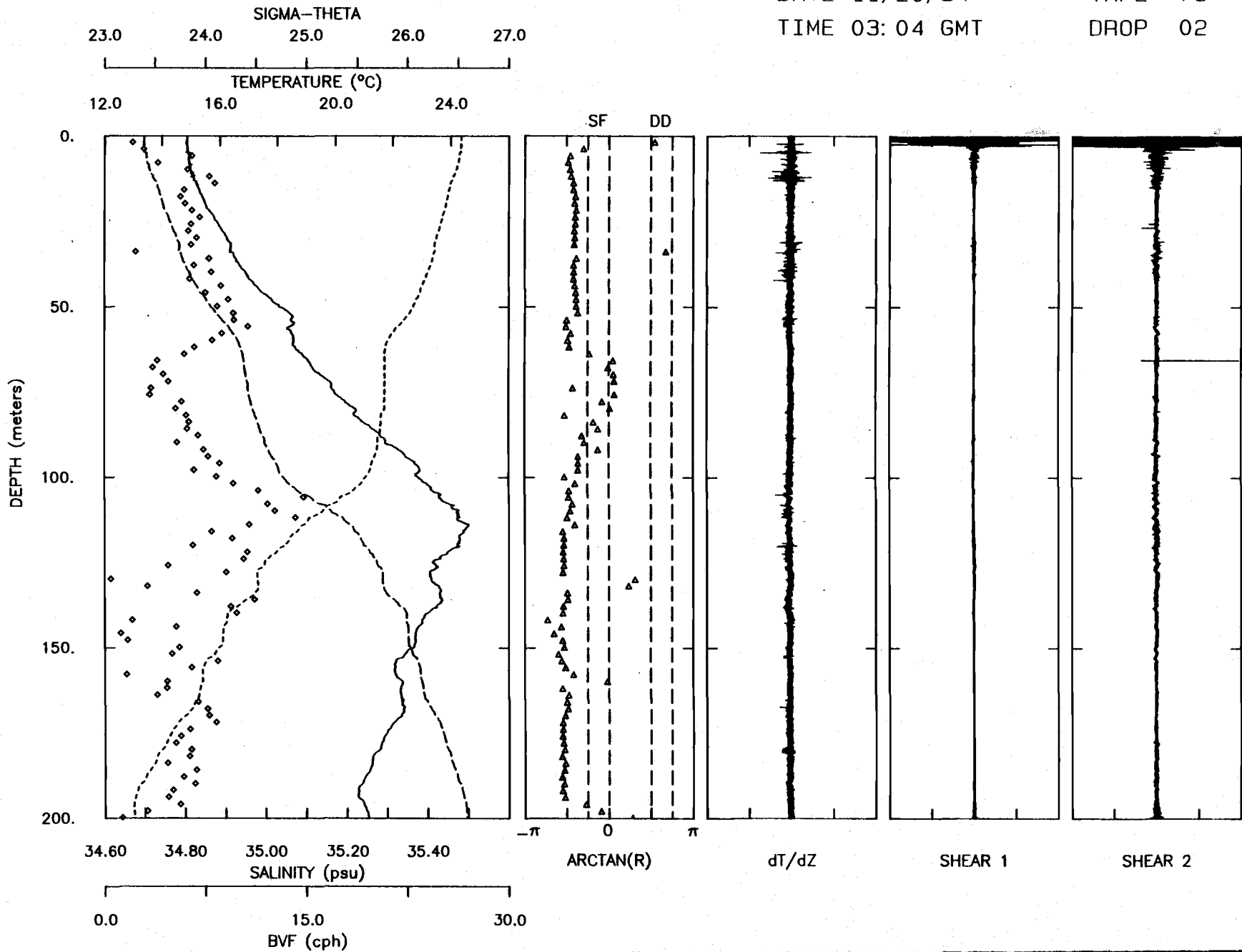
DATE 11/20/84
TIME 02:08 GMT

TAPE 74
DROP 19



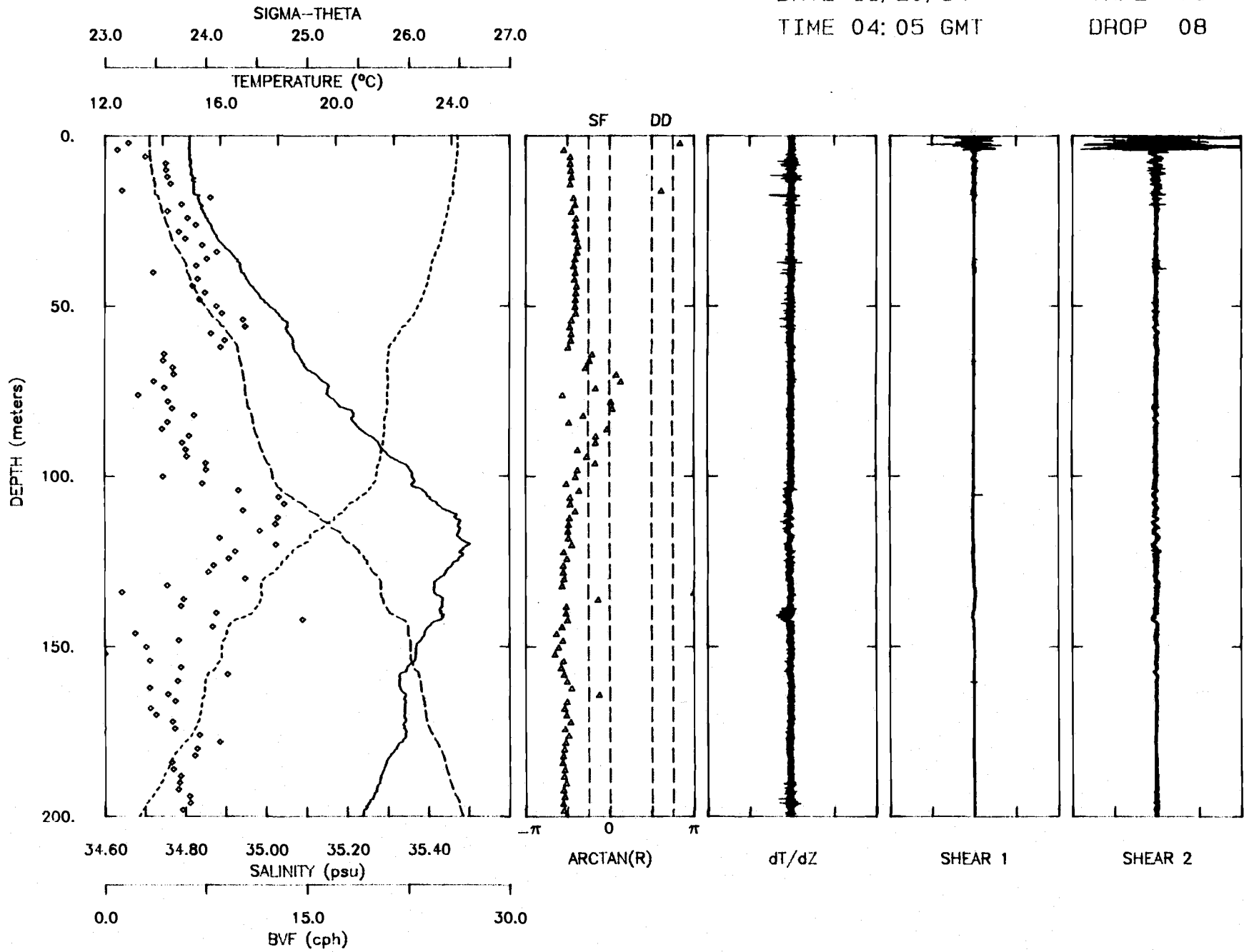
DATE 11/20/84
TIME 03:04 GMT

TAPE 75
DROP 02



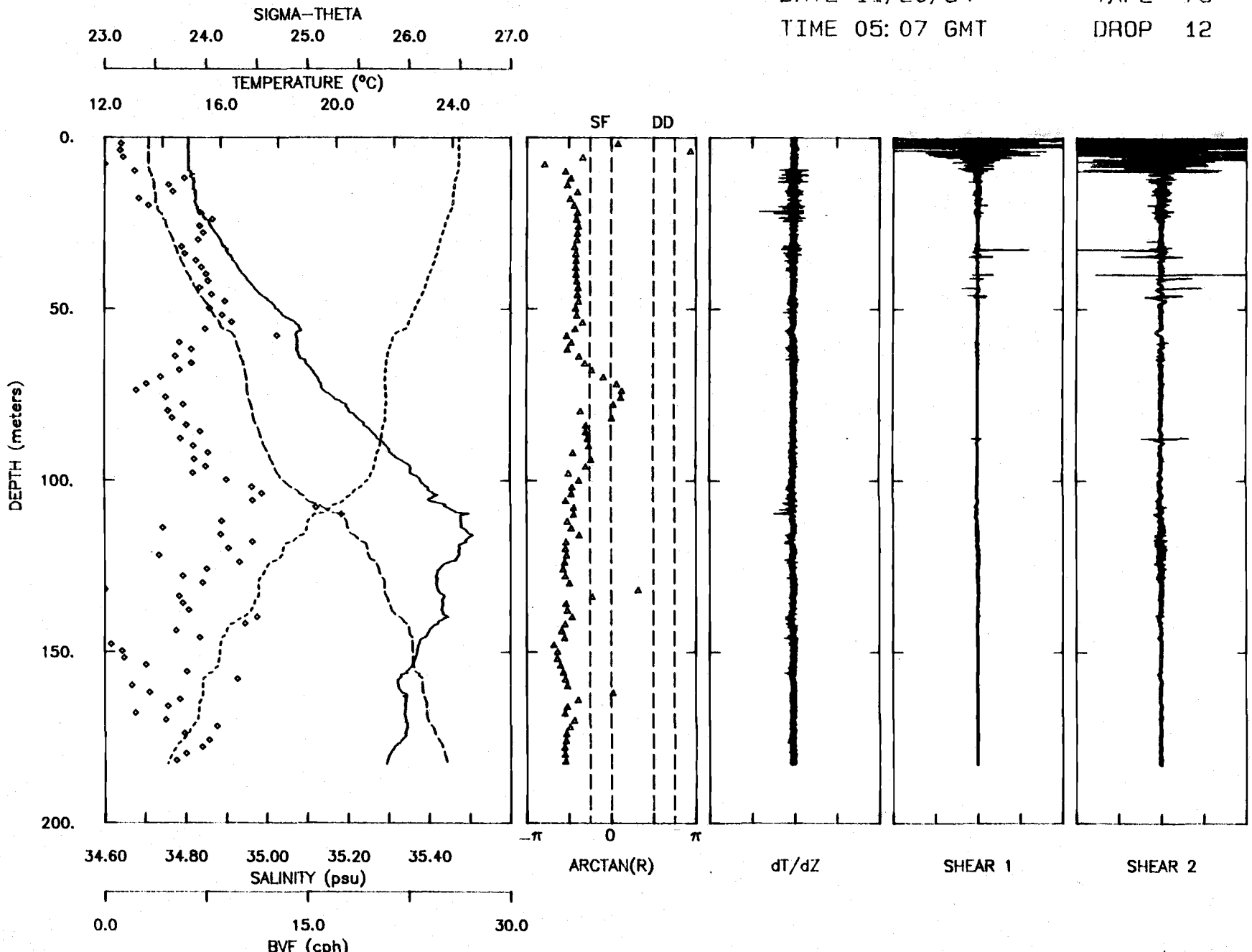
DATE 11/20/84
TIME 04:05 GMT

TAPE 75
DROP 08



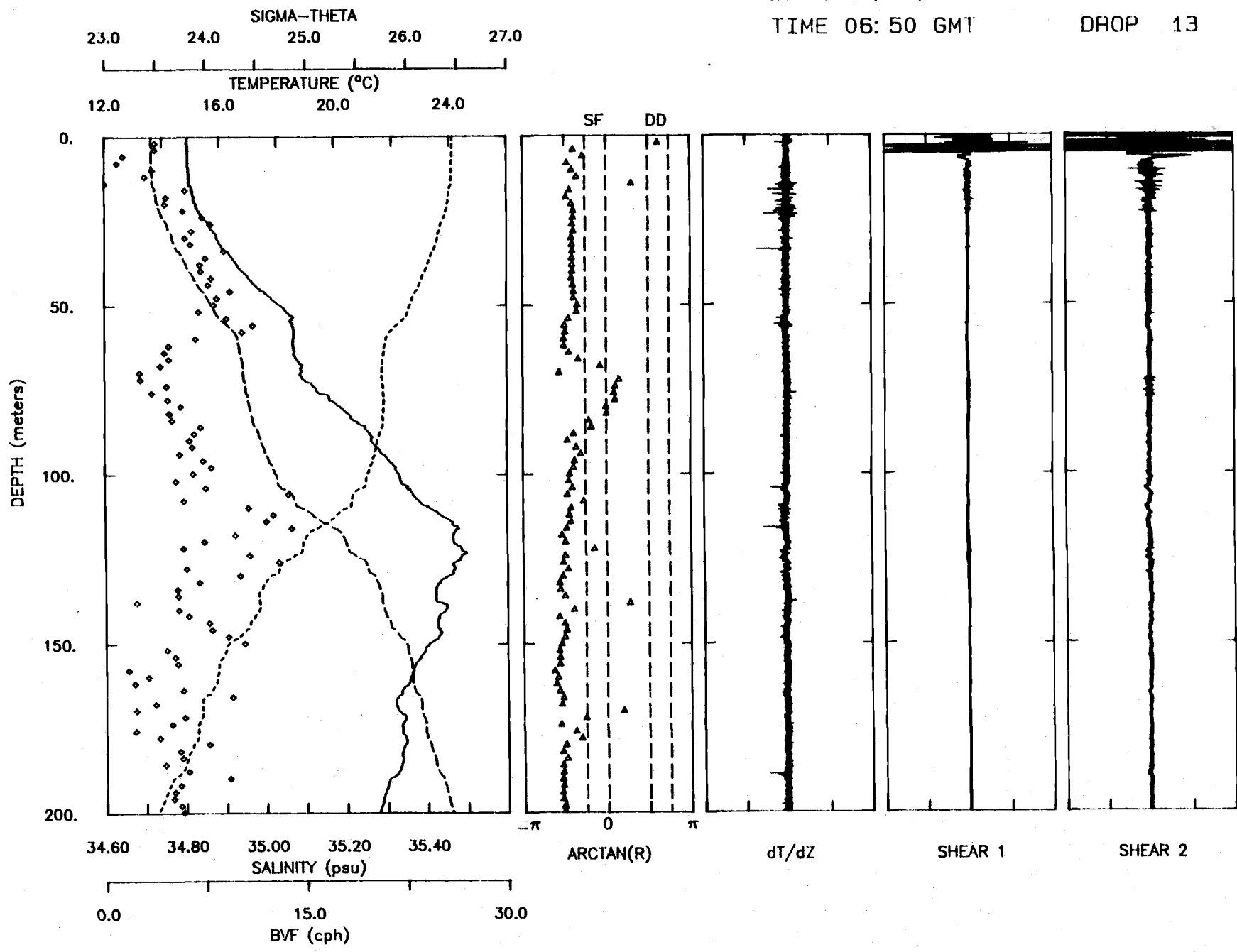
DATE 11/20/84
TIME 05:07 GMT

TAPE 75
DROP 12



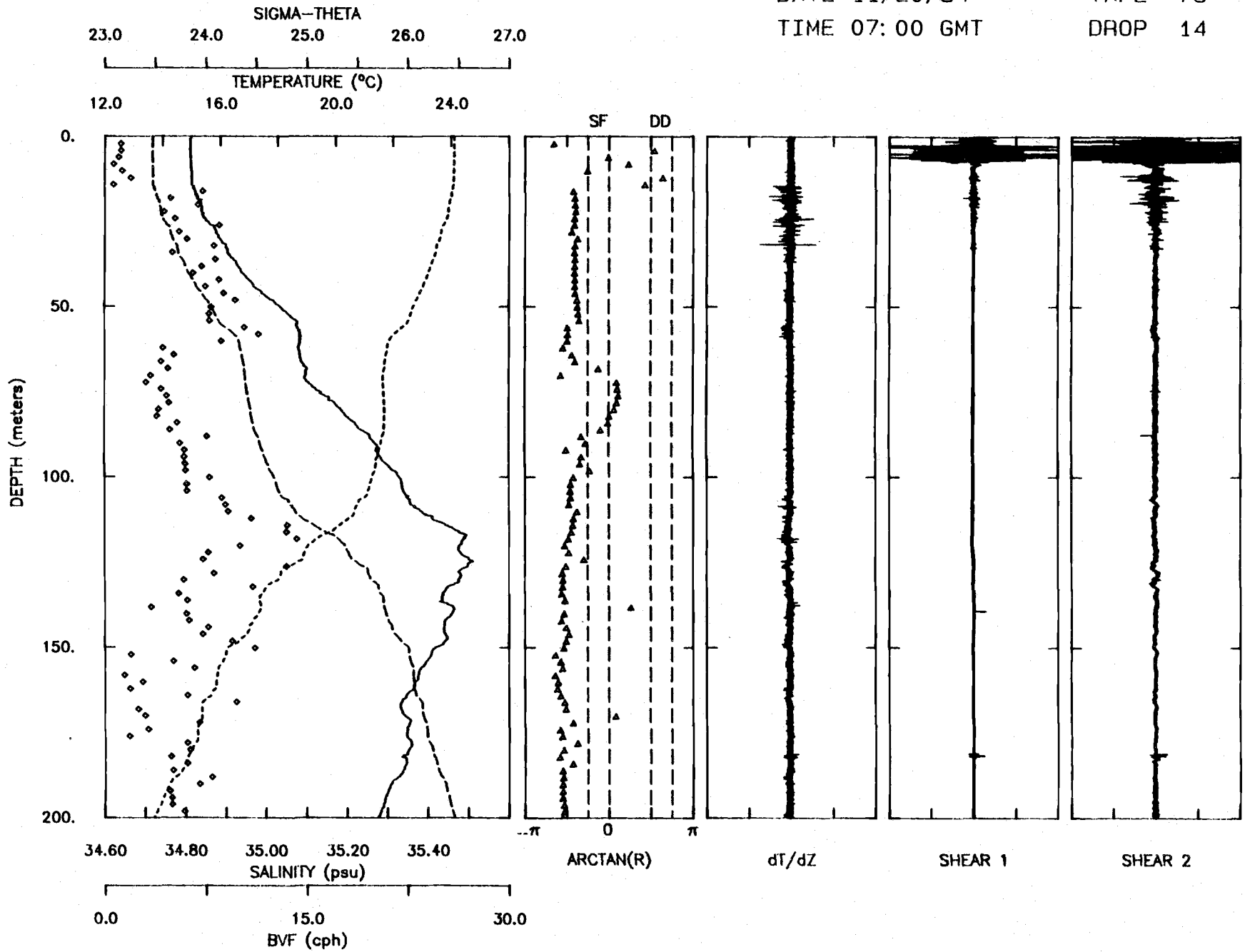
DATE 11/20/84
TIME 06:50 GMT

TAPE 75
DROP 13



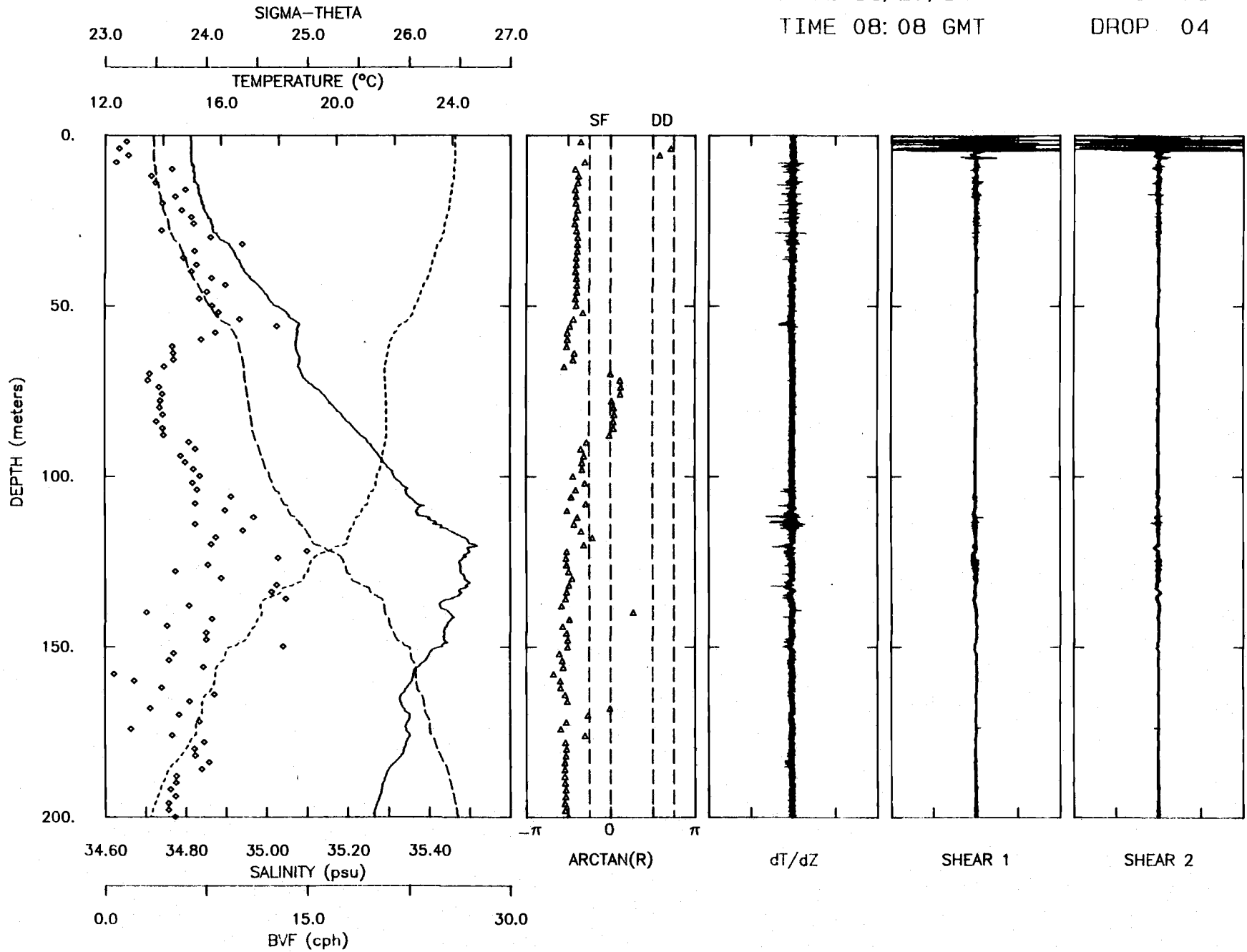
DATE 11/20/84
TIME 07:00 GMT

TAPE 75
DROP 14



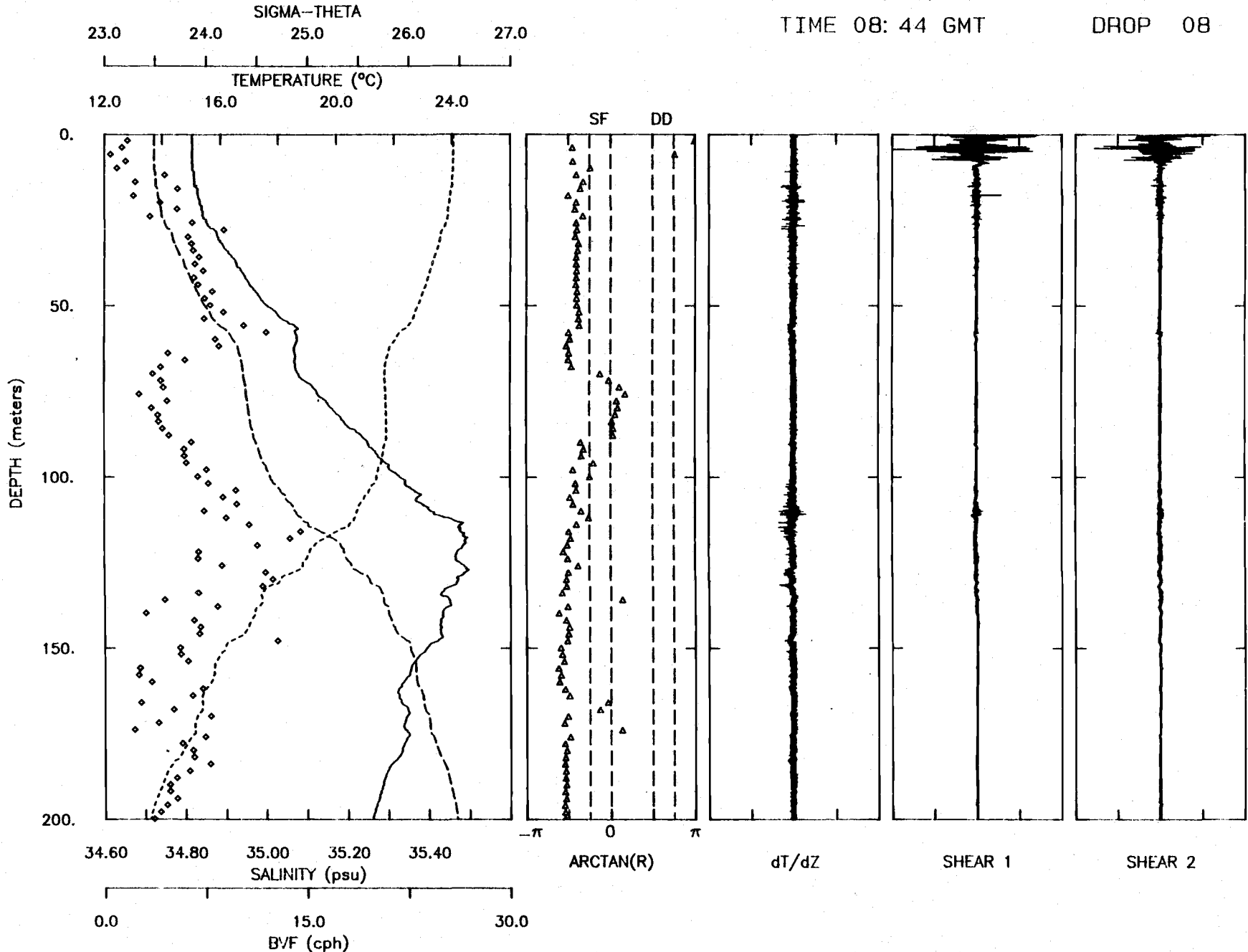
DATE 11/20/84
TIME 08:08 GMT

TAPE 76
DROP 04



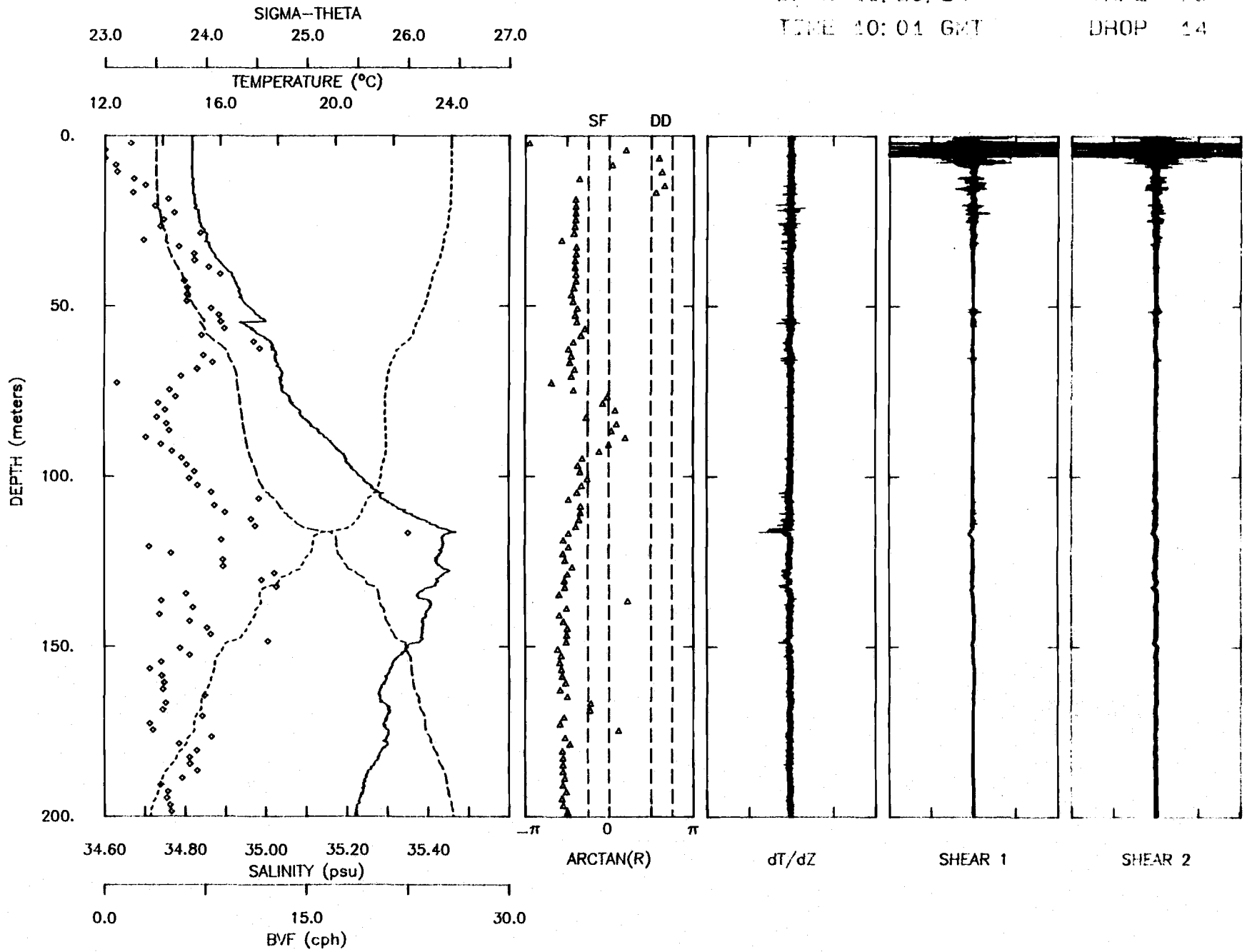
DATE 11/20/84
TIME 08:44 GMT

TAPE 76
DROP 08



DATE 11.20.84
TIME 10:01 GMT

TAPE 76
DRIP 14

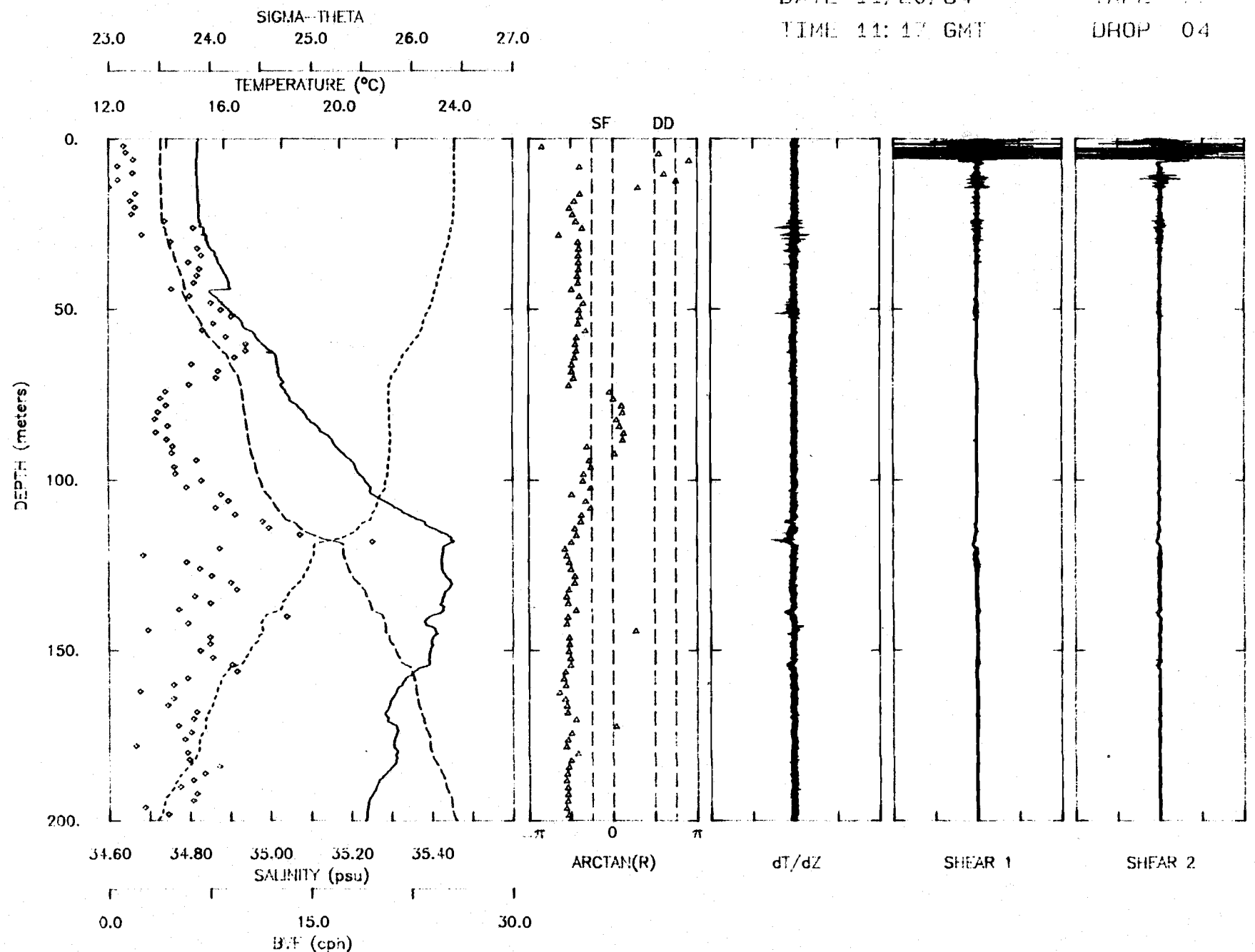


DATE 11/20/84

TAPE 77

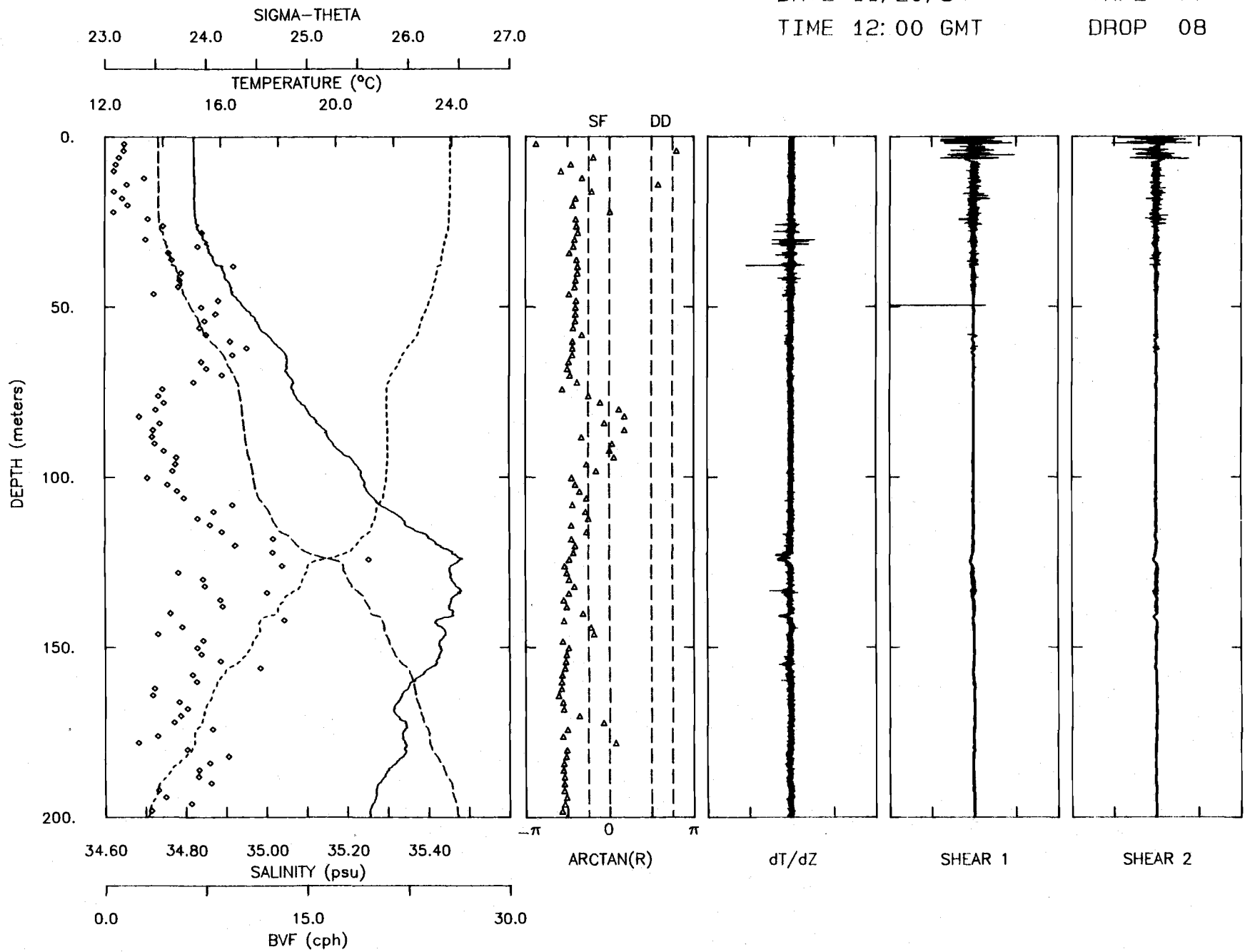
TIME 11:17 GMT

DROP 04



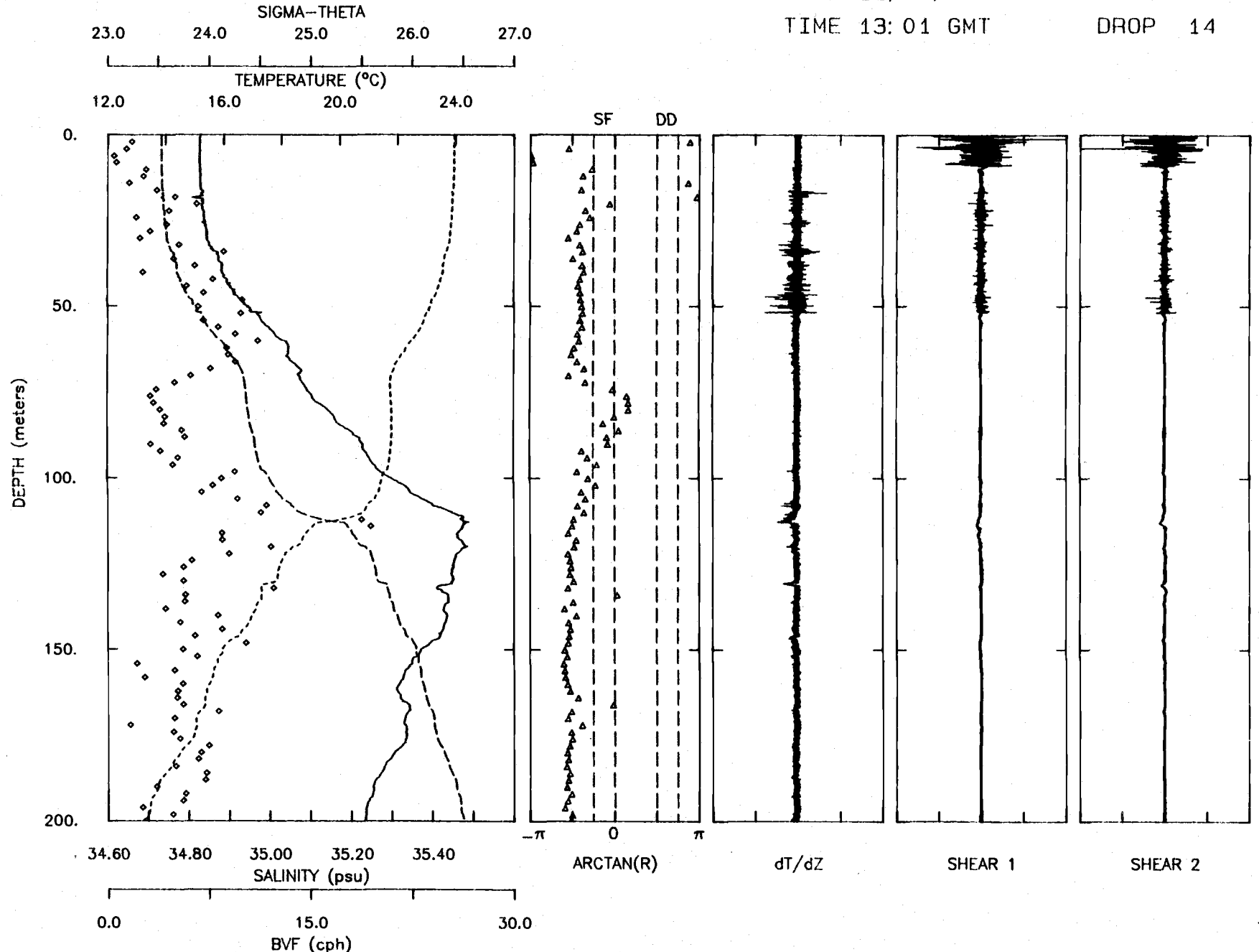
DATE 11/20/84
TIME 12:00 GMT

TAPE 77
DROP 08



DATE 11/20/84
TIME 13:01 GMT

TAPE 77
DROP 14

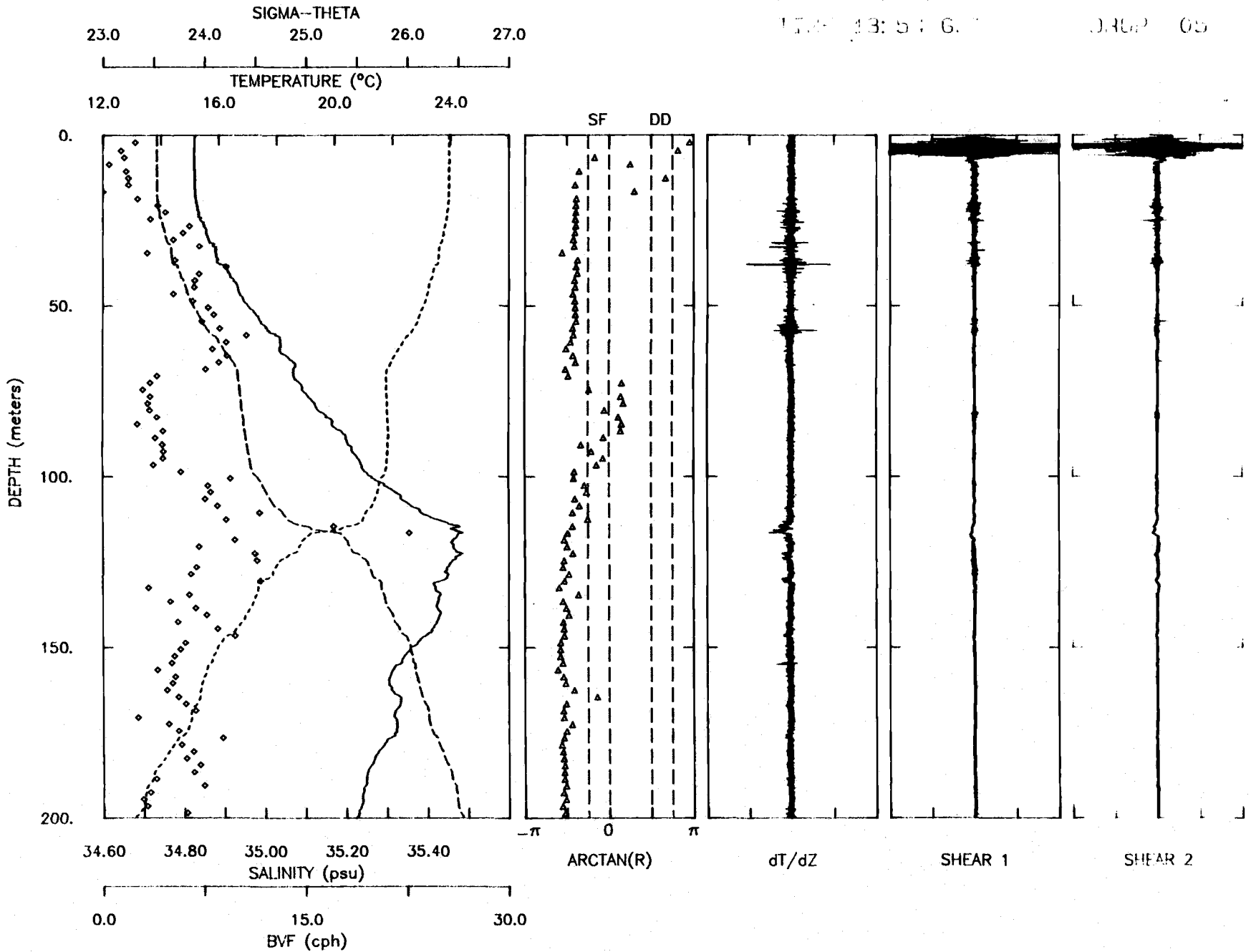


DATE: 11, 20, 87

TIME: 13:54.6

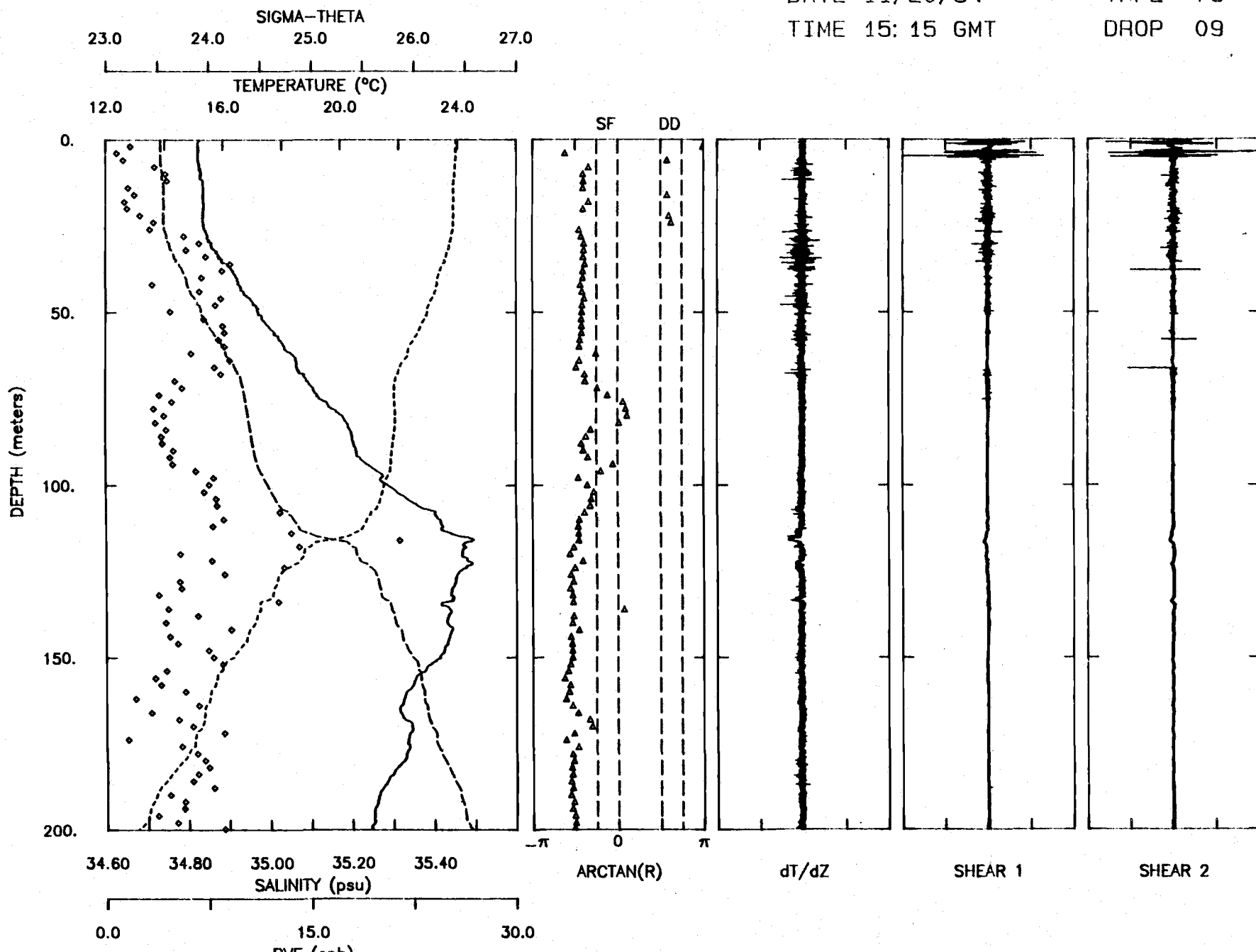
DRIP: 05

DRIP: 05



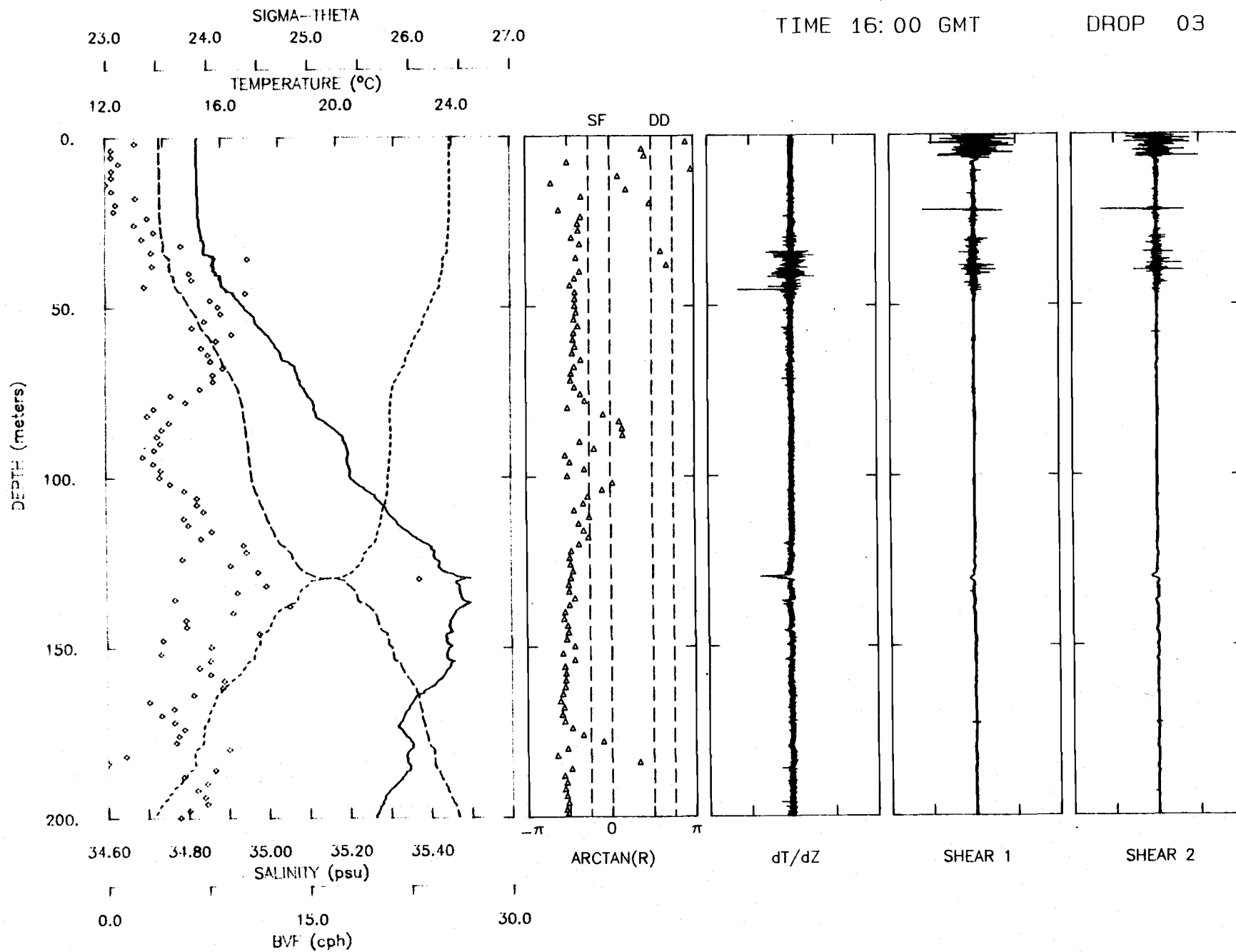
DATE 11/20/84
TIME 15:15 GMT

TAPE 78
DROP 09



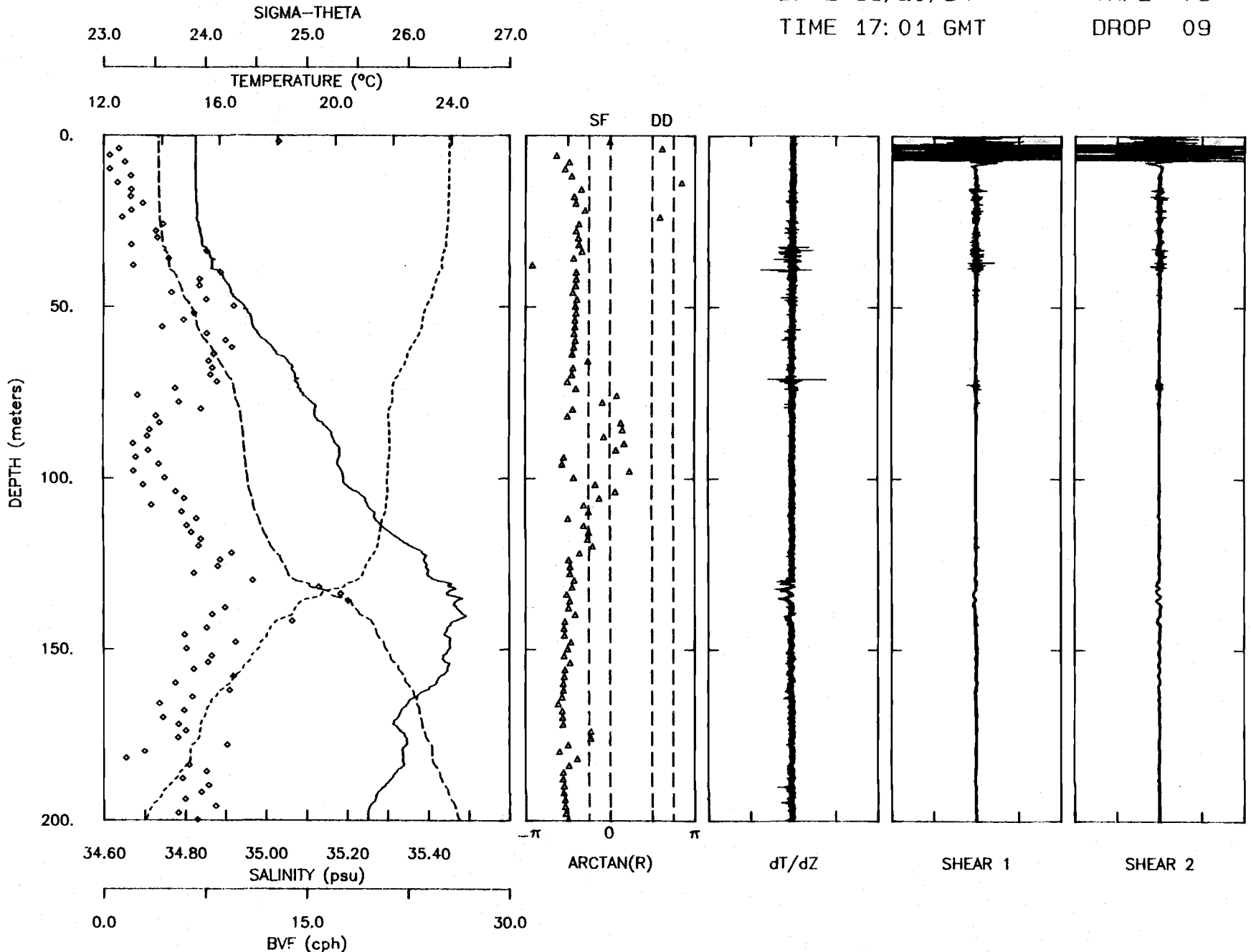
DATE 11/20/84
TIME 16:00 GMT

TAPE 79
DROP 03



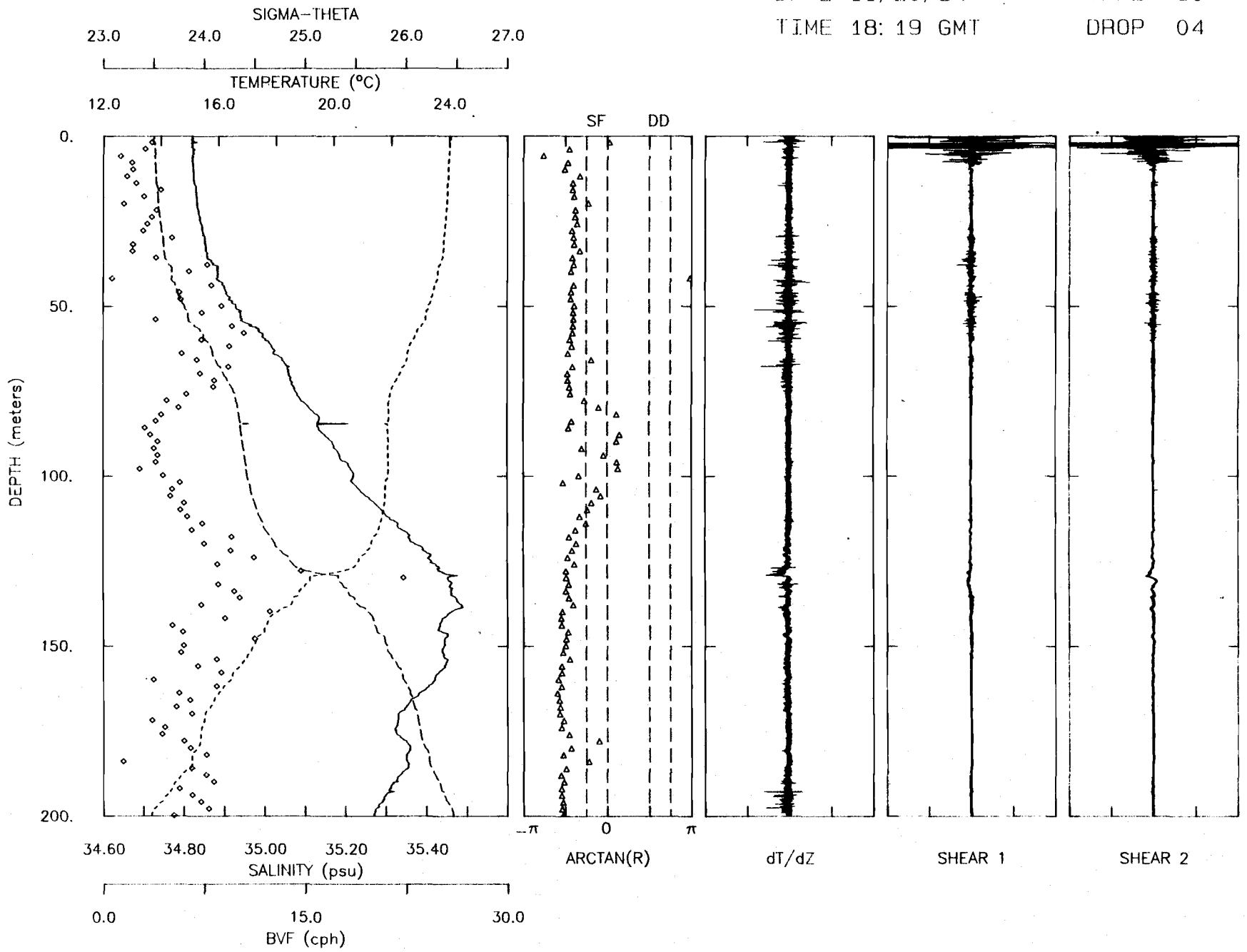
DATE 11/20/84
TIME 17:01 GMT

TAPE 79
DROP 09



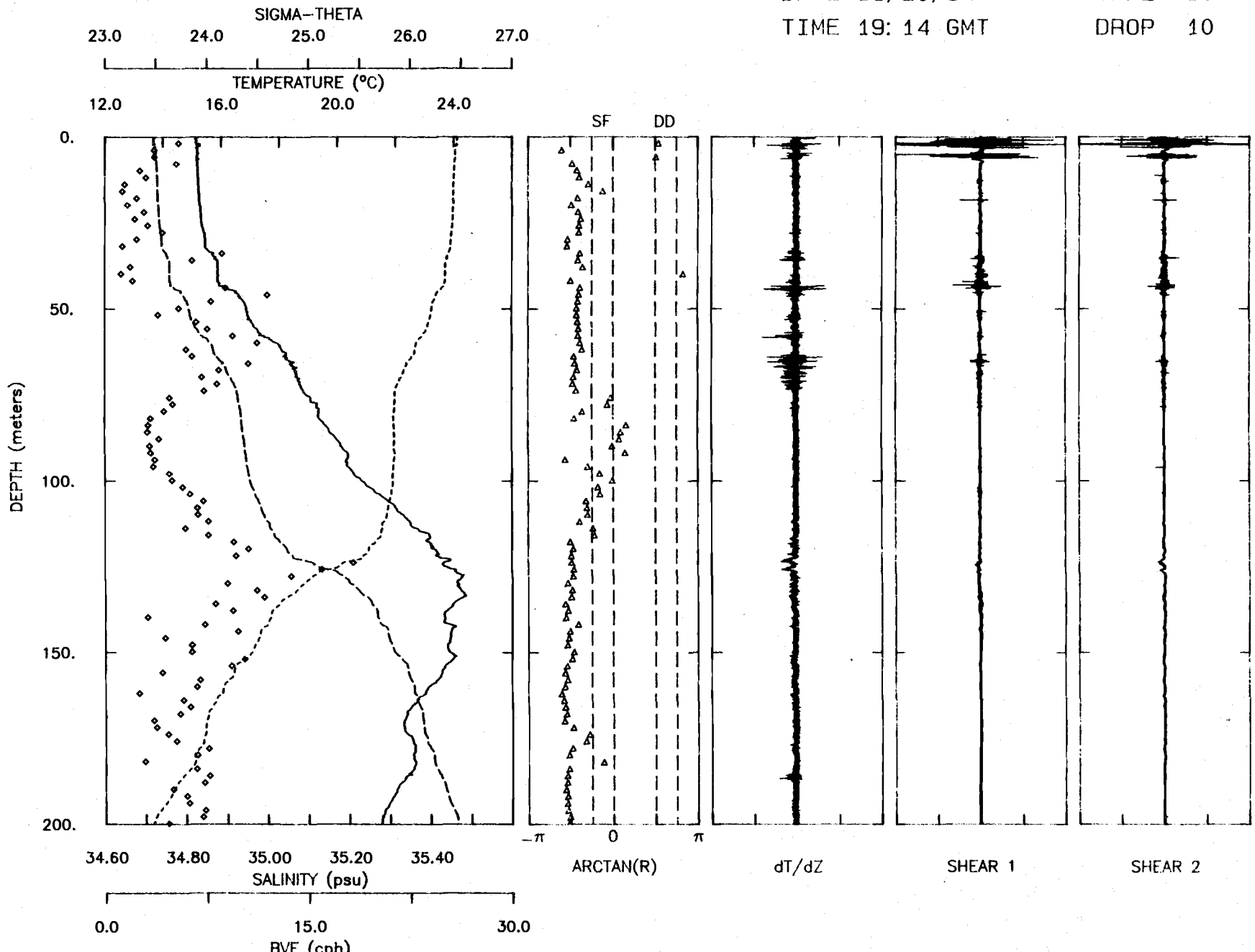
DATE 11/20/84
TIME 18:19 GMT

TAPE 80
DROP 04



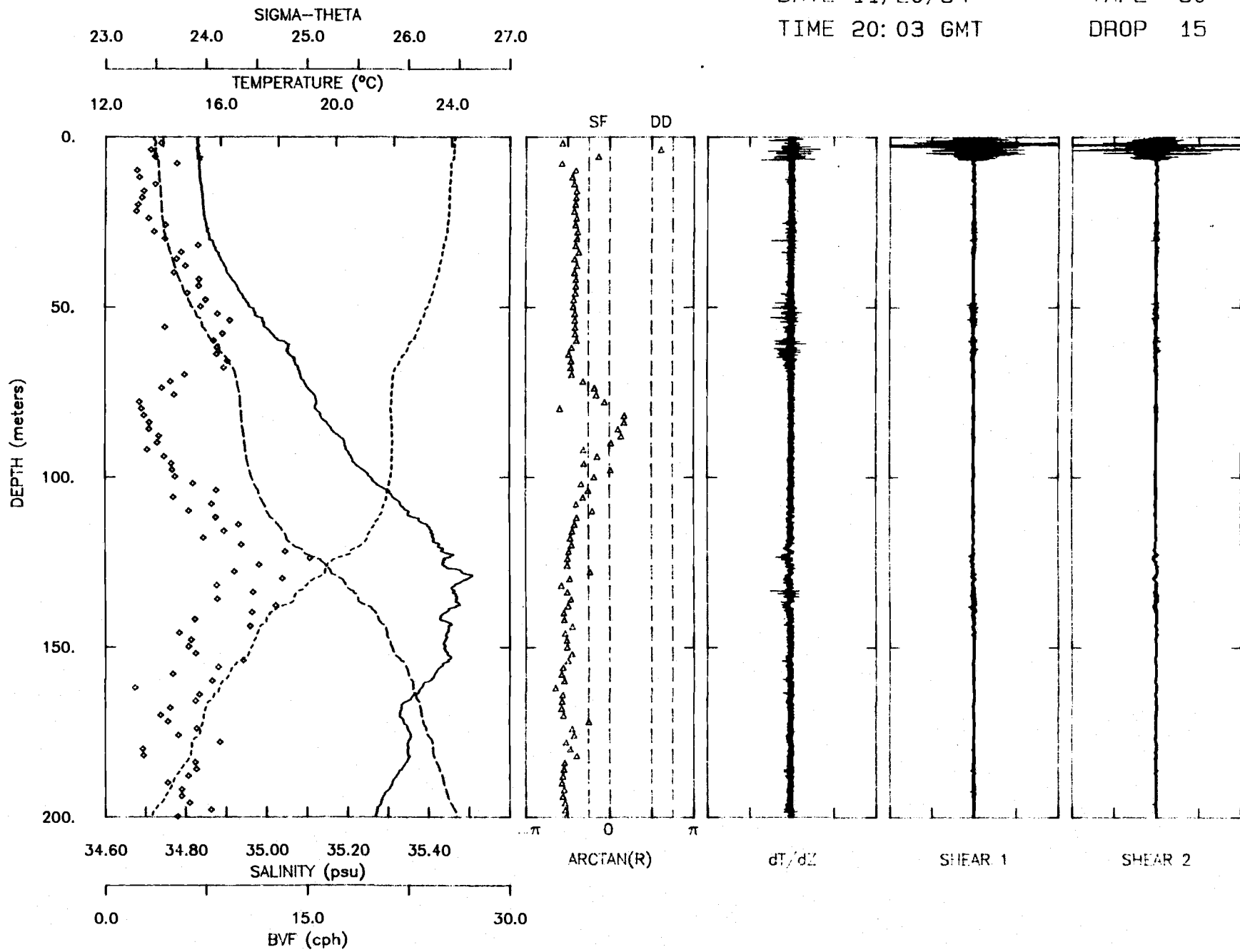
DATE 11/20/84
TIME 19:14 GMT

TAPE 80
DROP 10



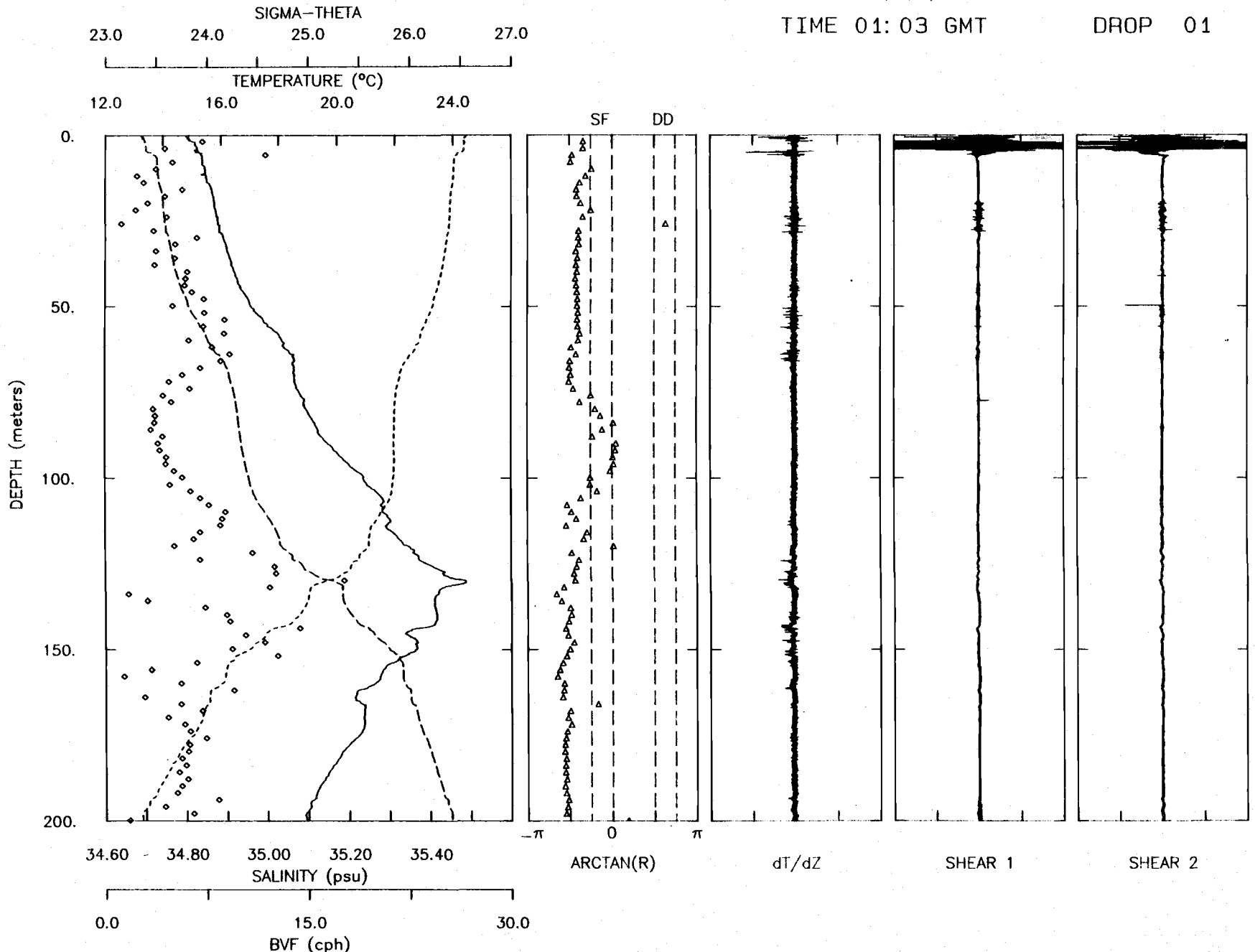
DATE 11/20/84
TIME 20:03 GMT

TAPE 80
DROP 15



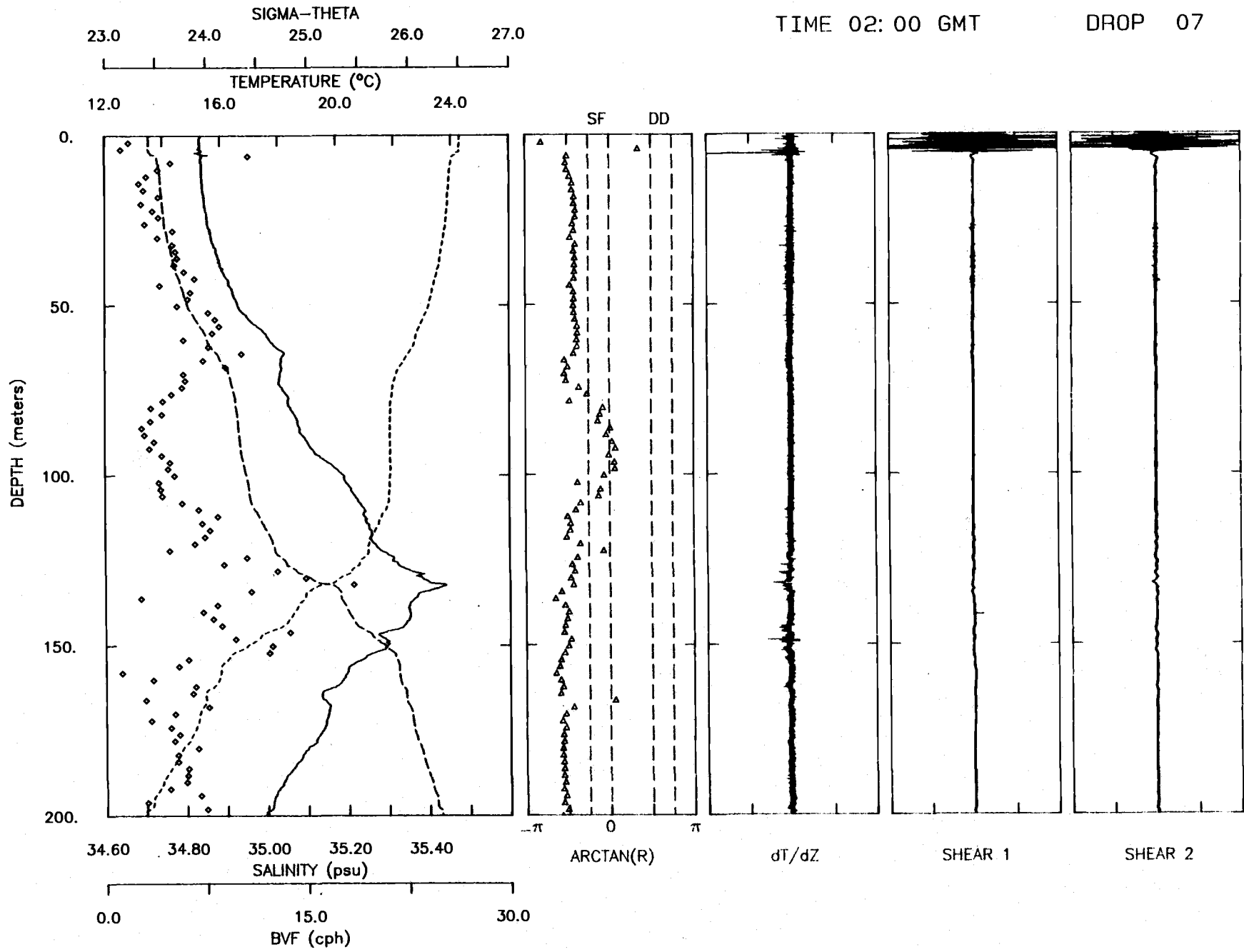
DATE 11/21/84
TIME 01:03 GMT

TAPE 83
DROP 01



DATE 11/21/84
TIME 02:00 GMT

TAPE 83
DROP 07

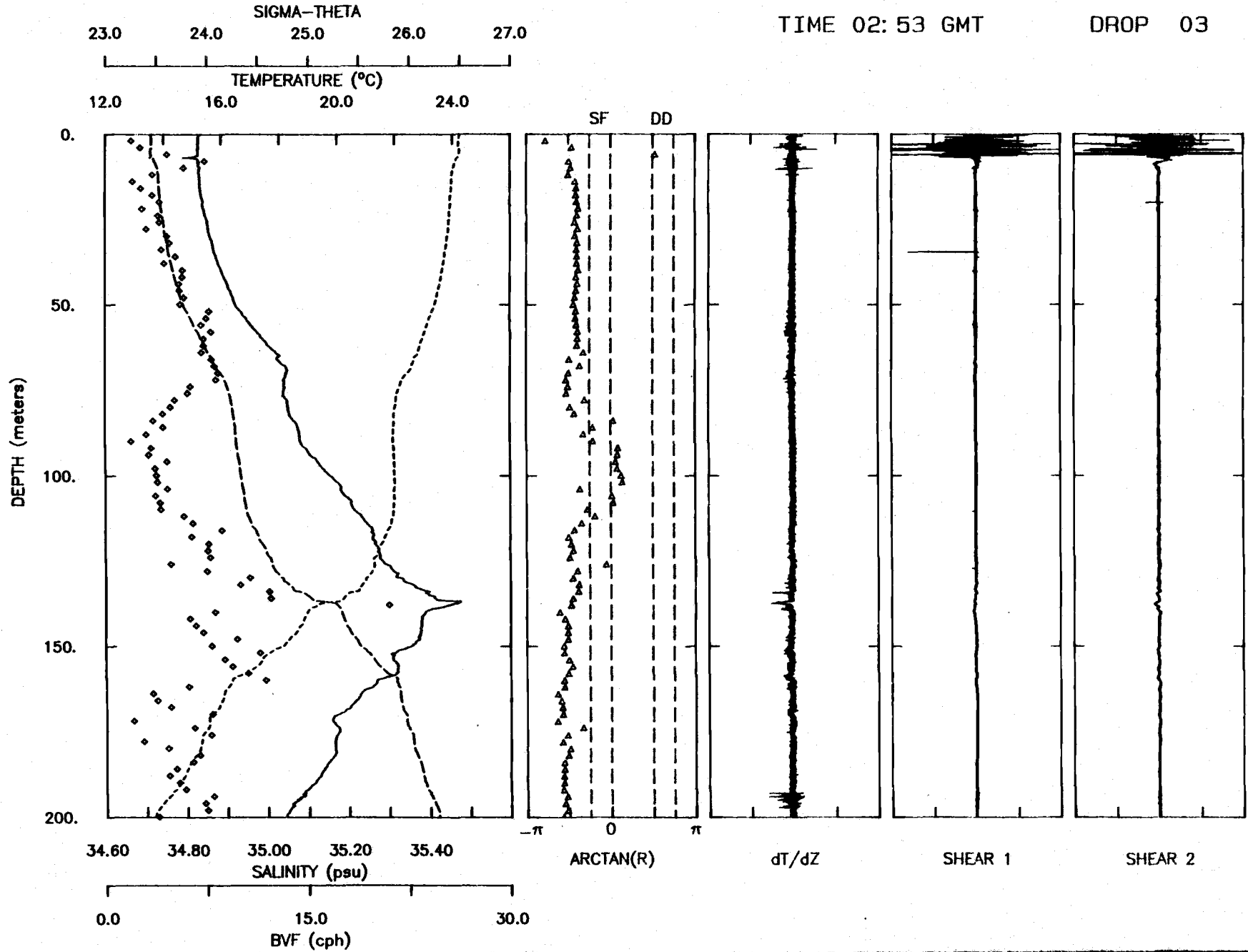


DATE 11/21/84

TAPE X83

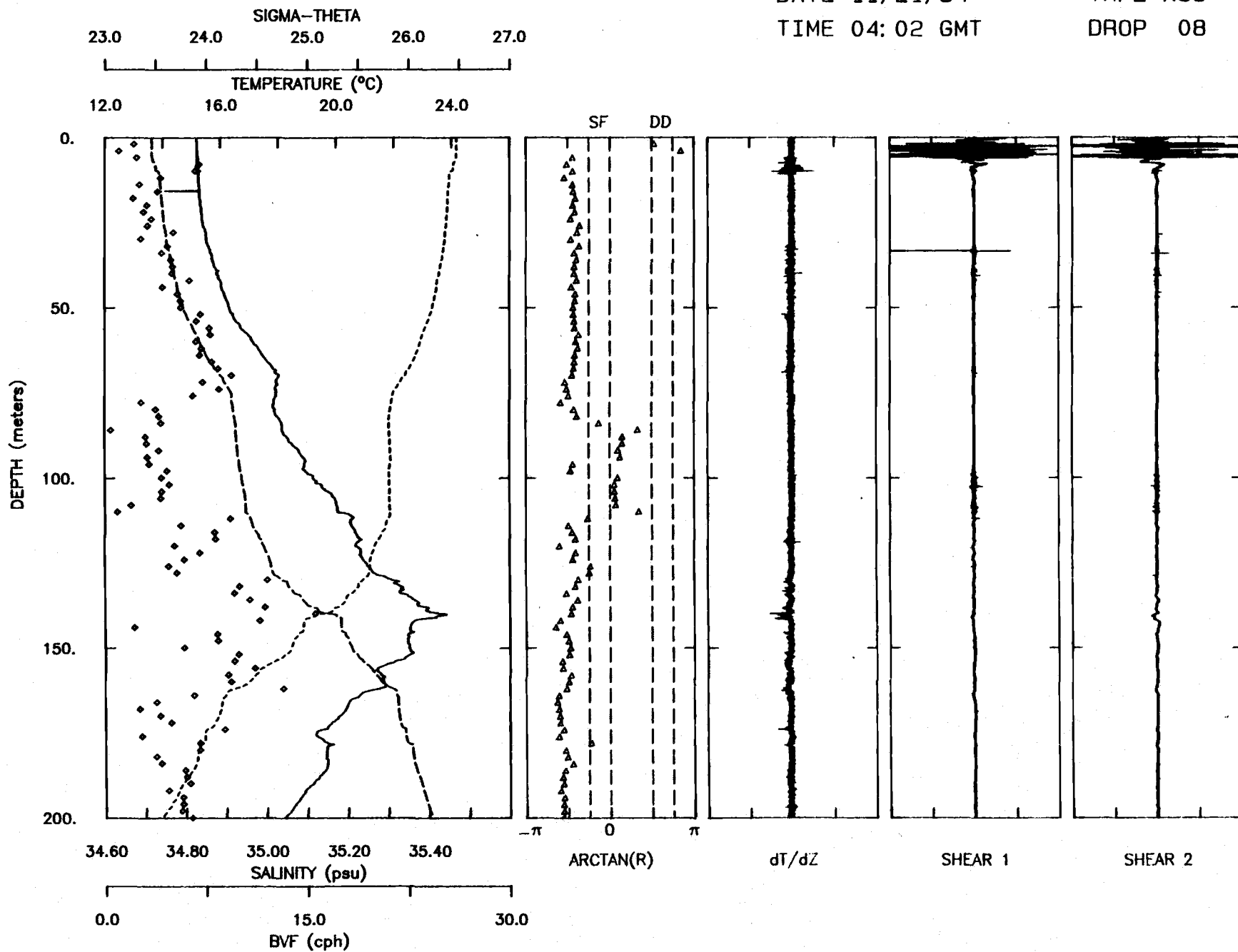
TIME 02:53 GMT

DROP 03



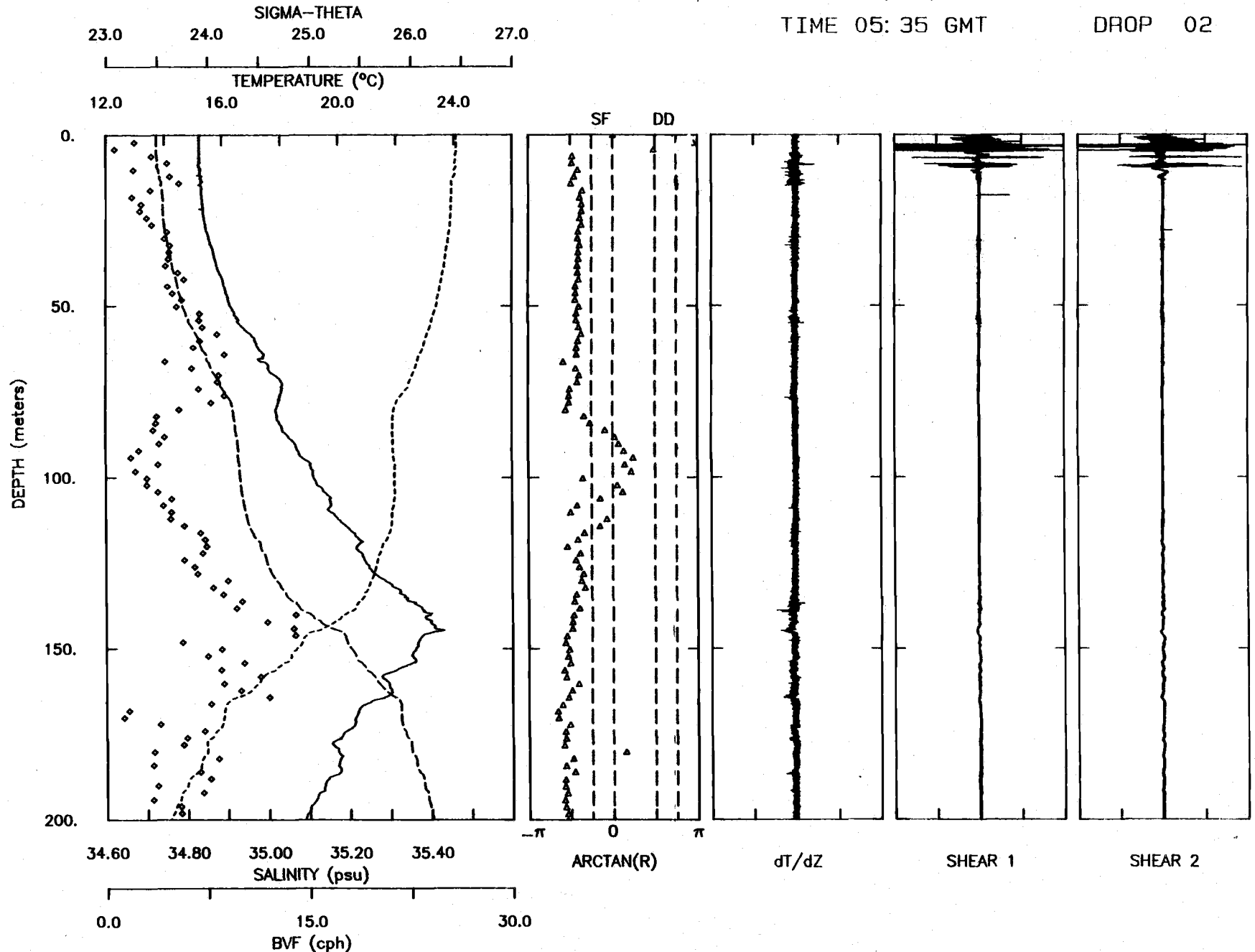
DATE 11/21/84
TIME 04:02 GMT

TAPE X83
DROP 08



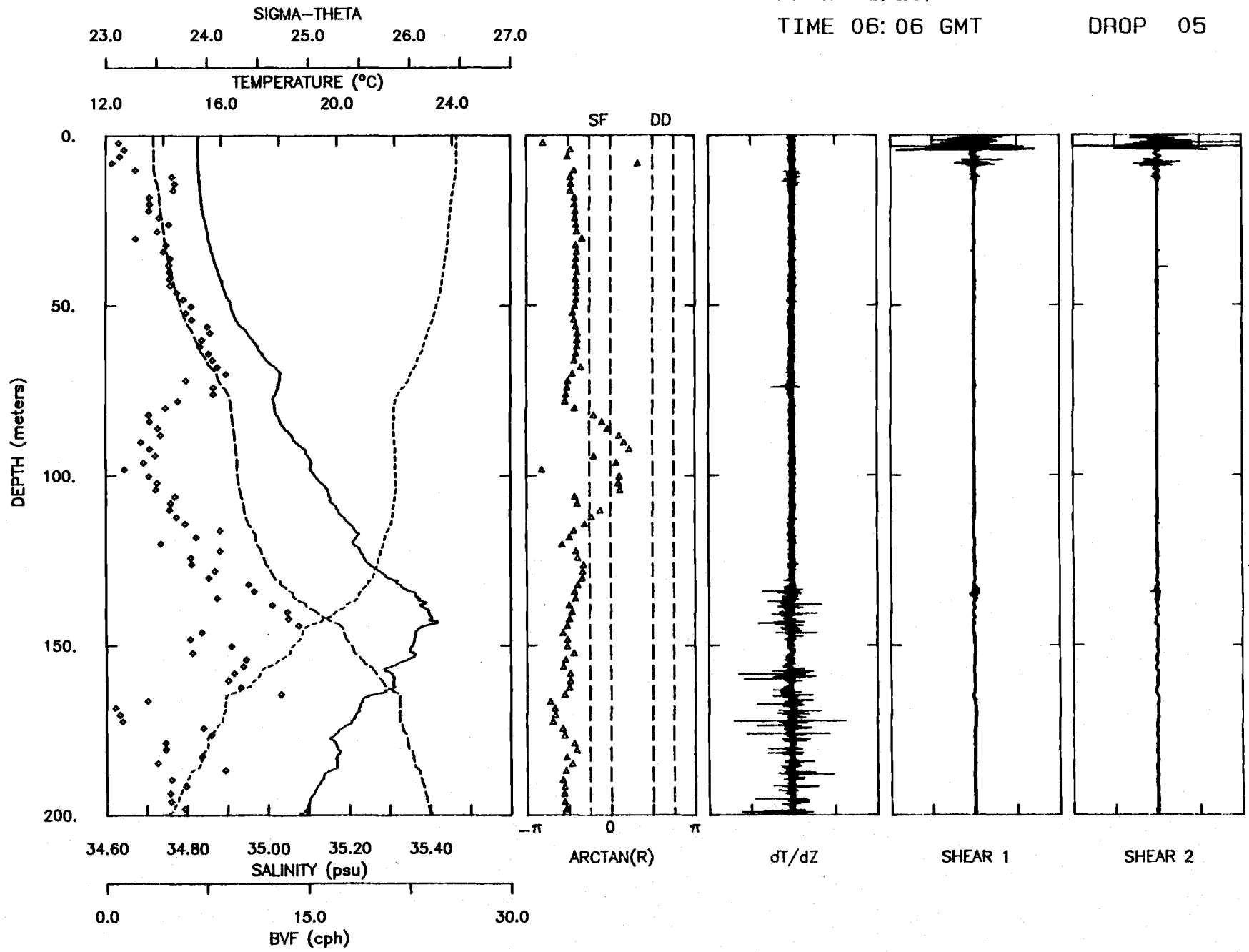
DATE 11/21/84
TIME 05:35 GMT

TAPE 84
DROP 02



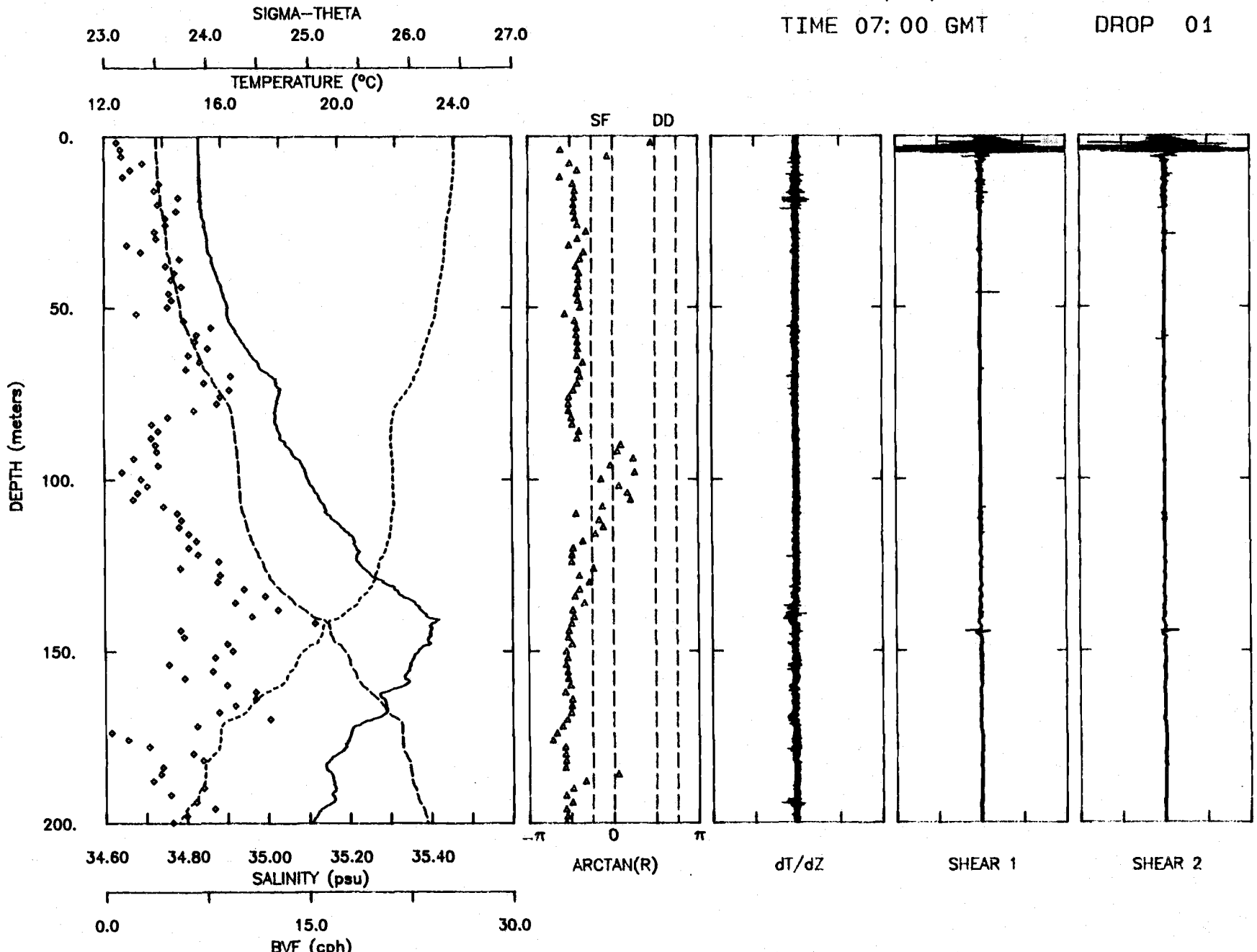
DATE 11/21/84
TIME 06:06 GMT

TAPE 84
DROP 05



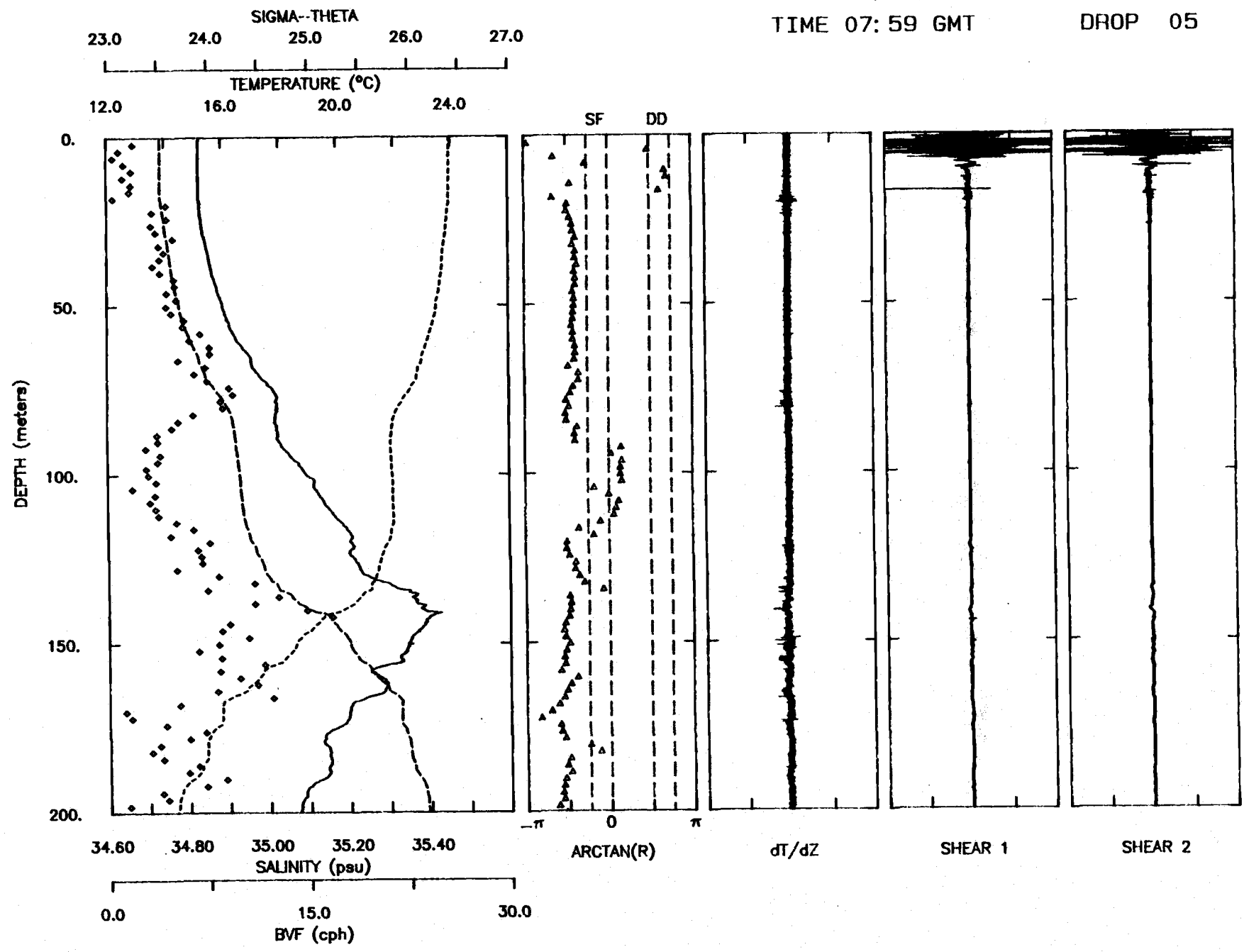
DATE 11/21/84
TIME 07:00 GMT

TAPE 85
DROP 01



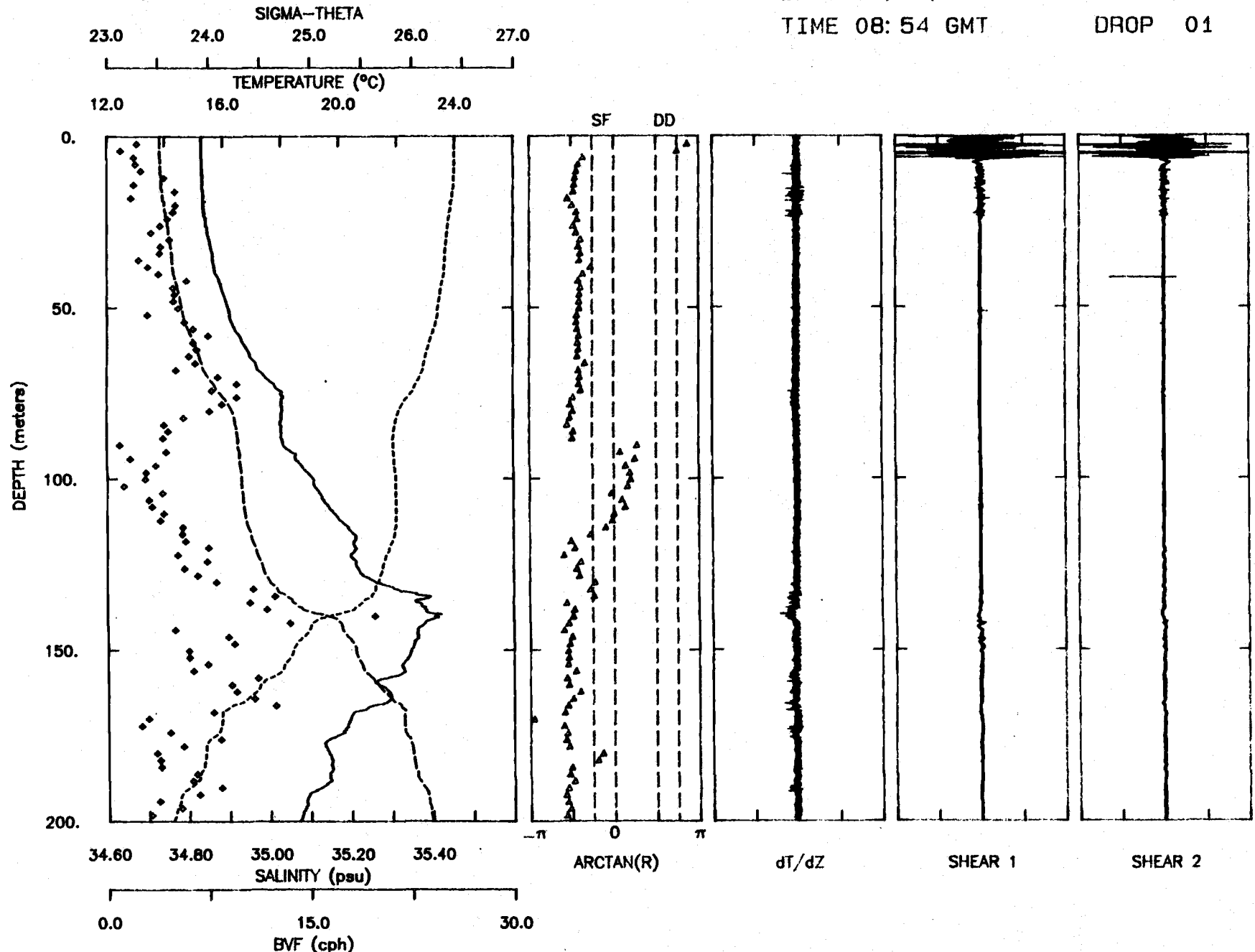
DATE 11/21/84
TIME 07:59 GMT

TAPE 85
DROP 05



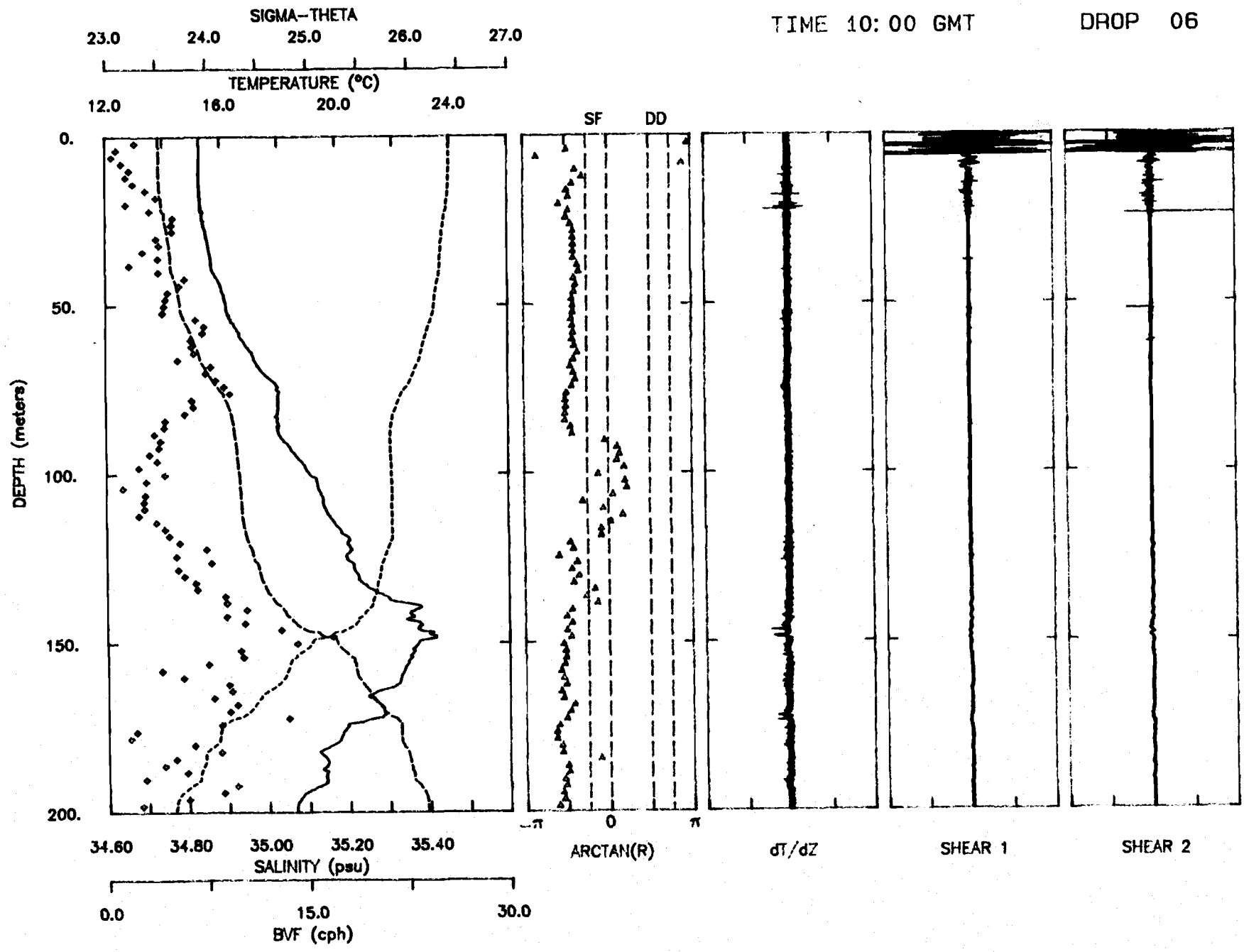
DATE 11/21/84
TIME 08:54 GMT

TAPE 86
DROP 01



DATE 11/21/84
TIME 10:00 GMT

TAPE 86
DROP 06

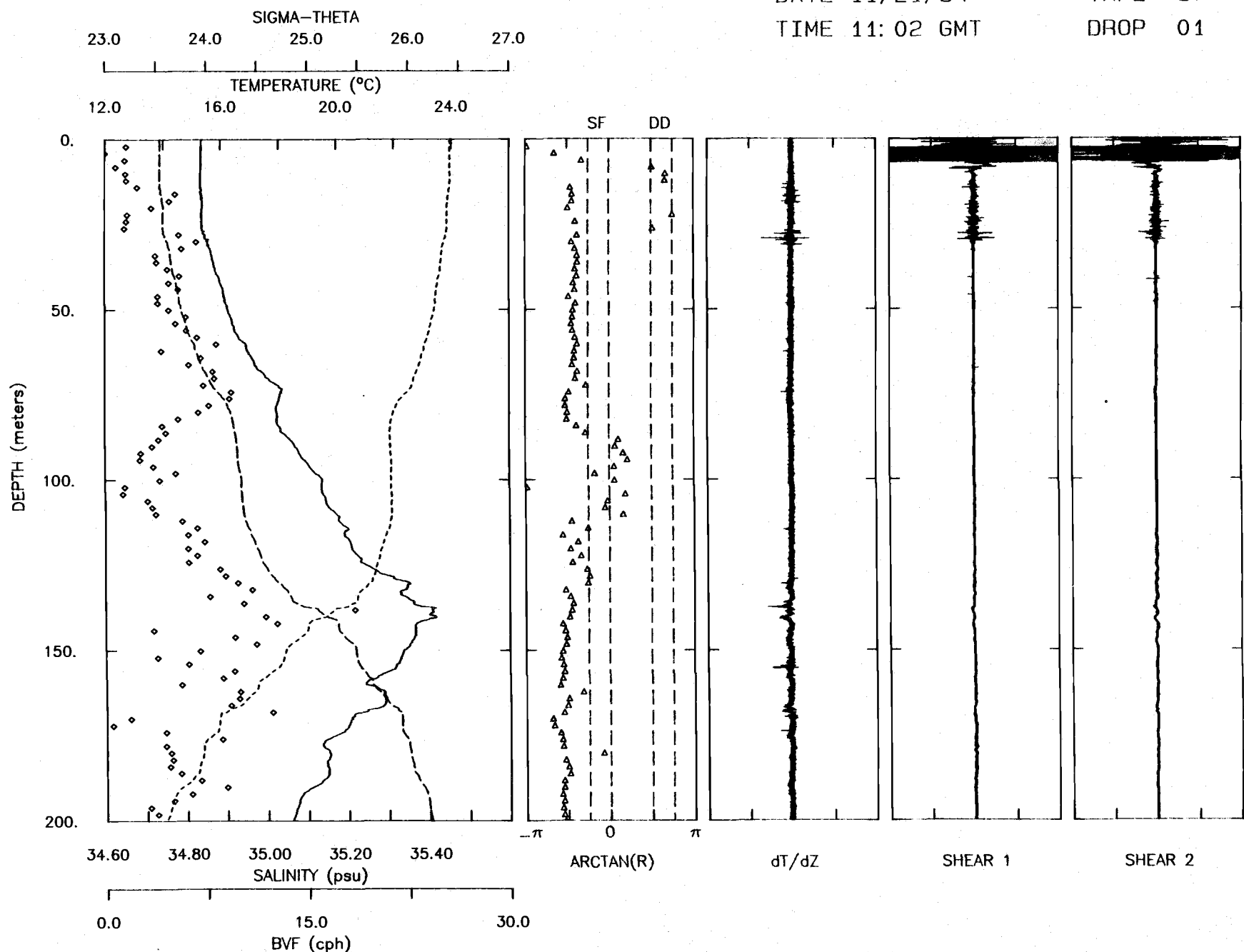


DATE 11/21/84

TAPE 87

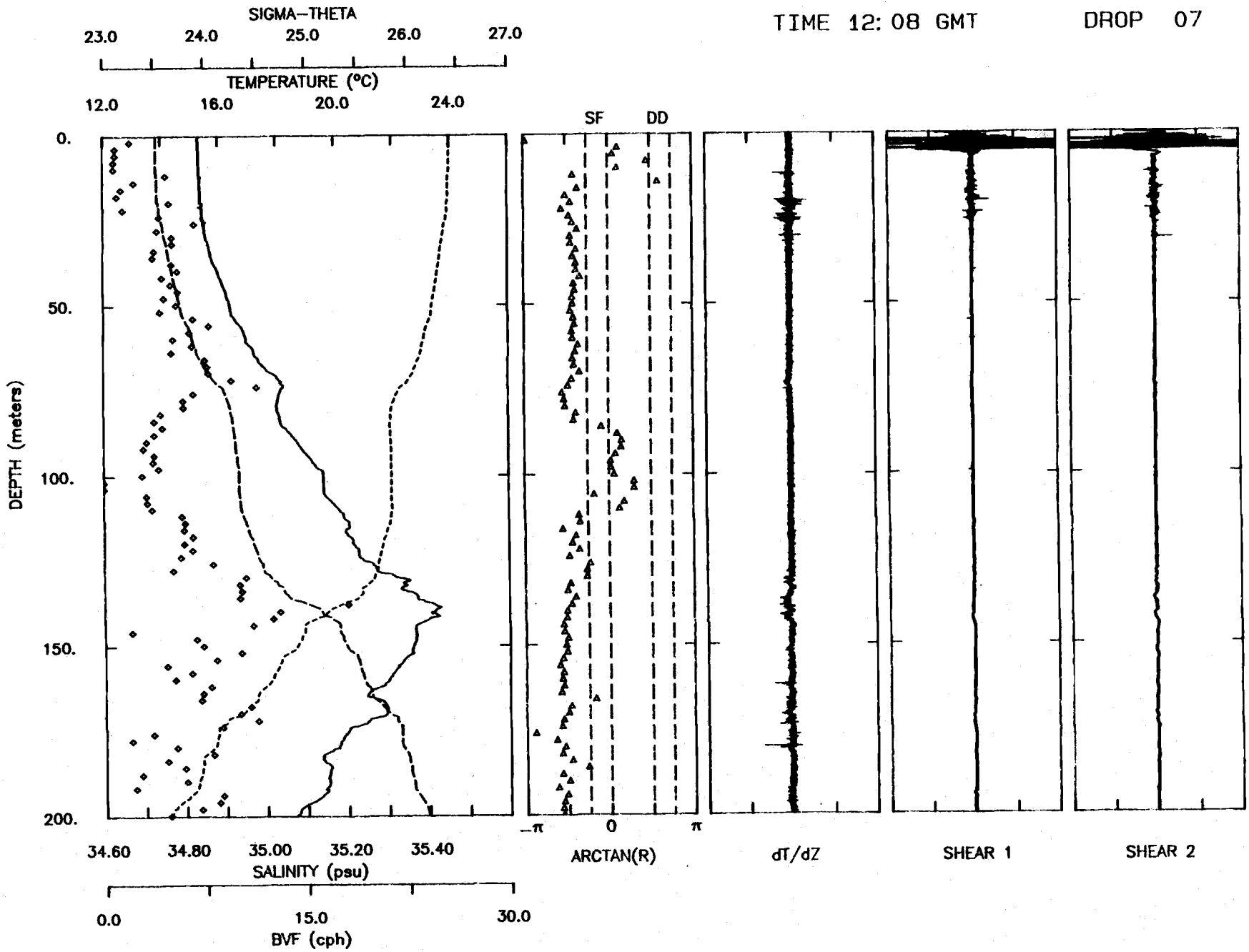
TIME 11:02 GMT

DROP 01



DATE 11/21/84
TIME 12:08 GMT

TAPE 87
DROP 07

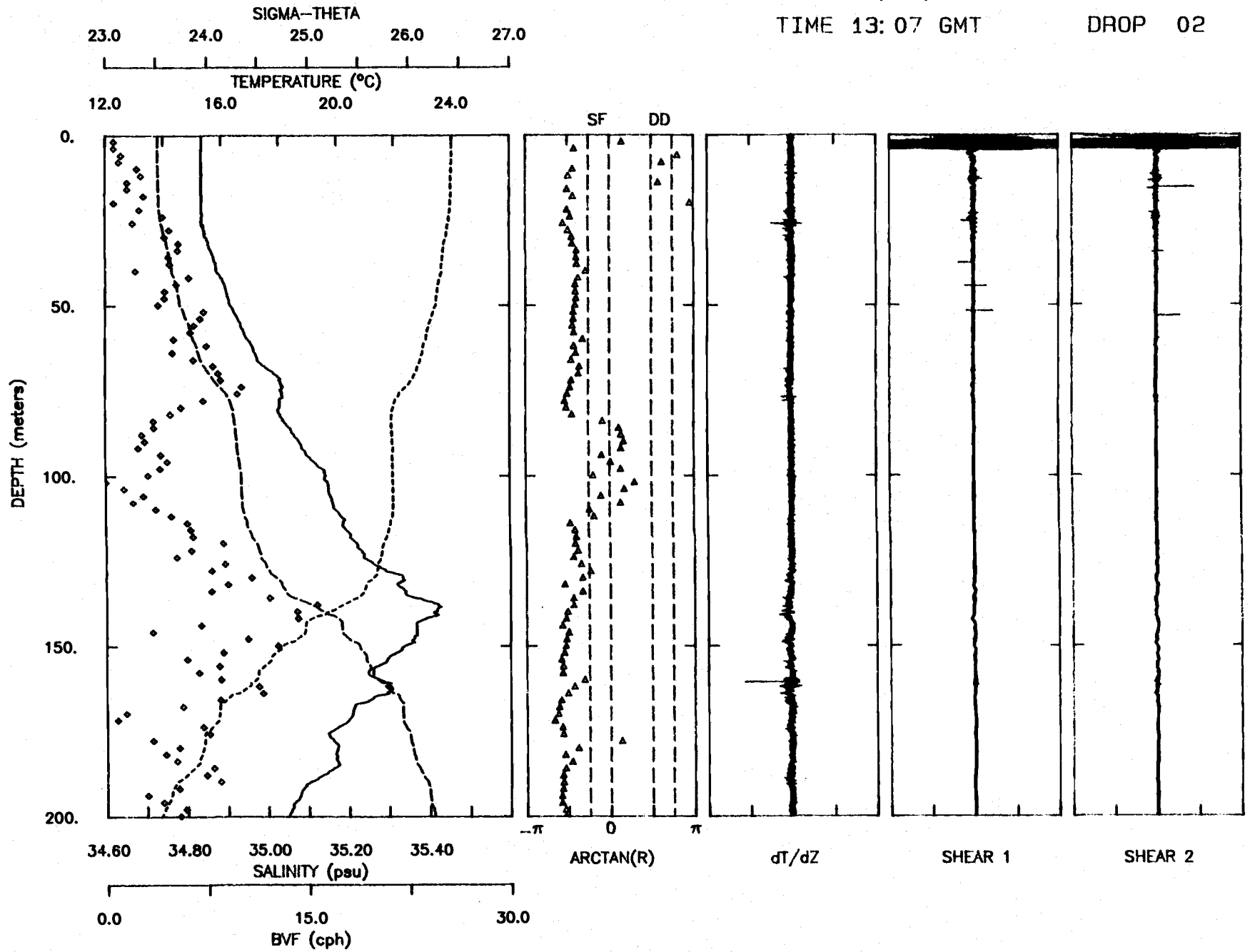


DATE 11/21/84

TAPE 88

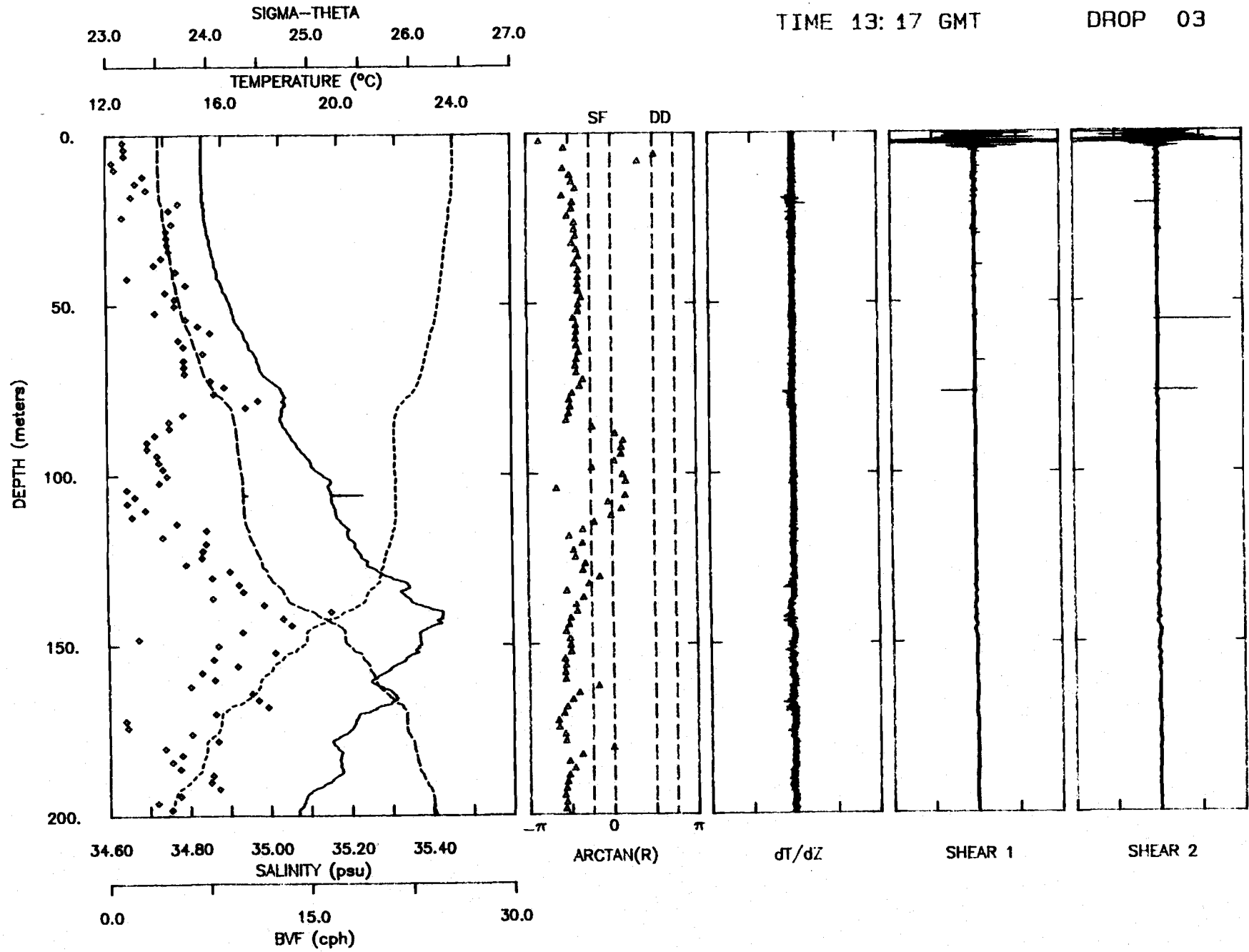
TIME 13:07 GMT

DROP 02



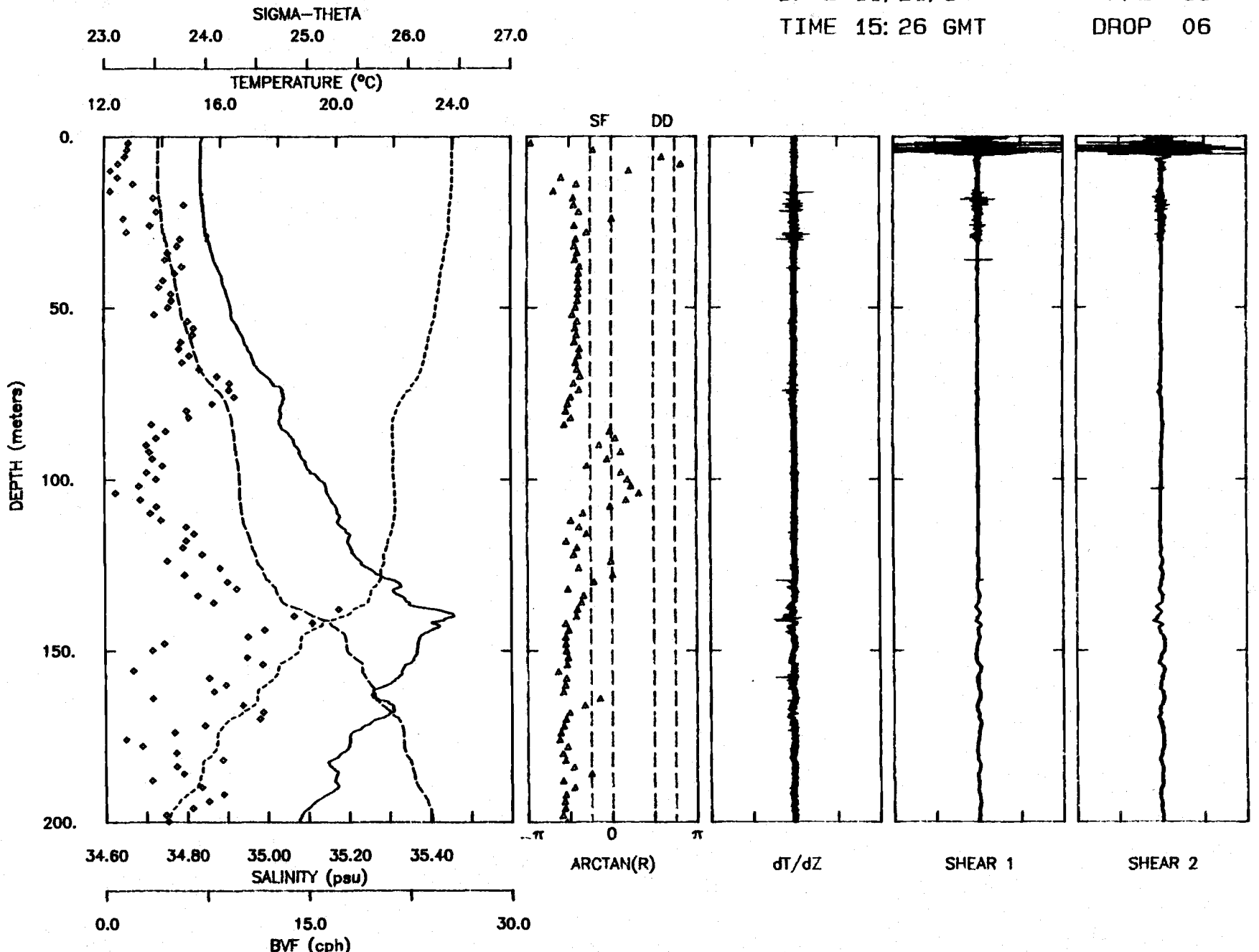
DATE 11/21/84
TIME 13:17 GMT

TAPE 88
DROP 03



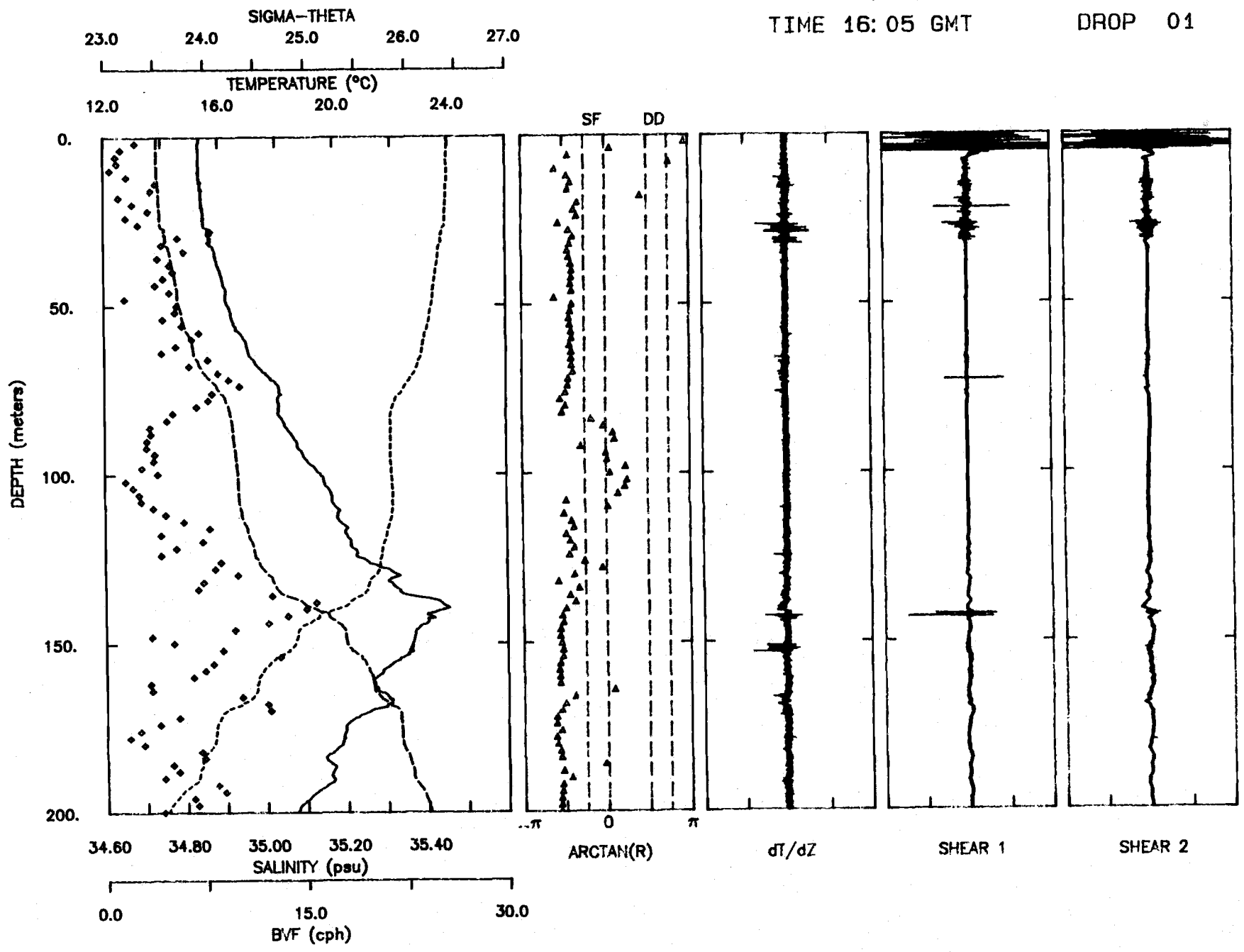
DATE 11/21/84
TIME 15:26 GMT

TAPE 88
DROP 06



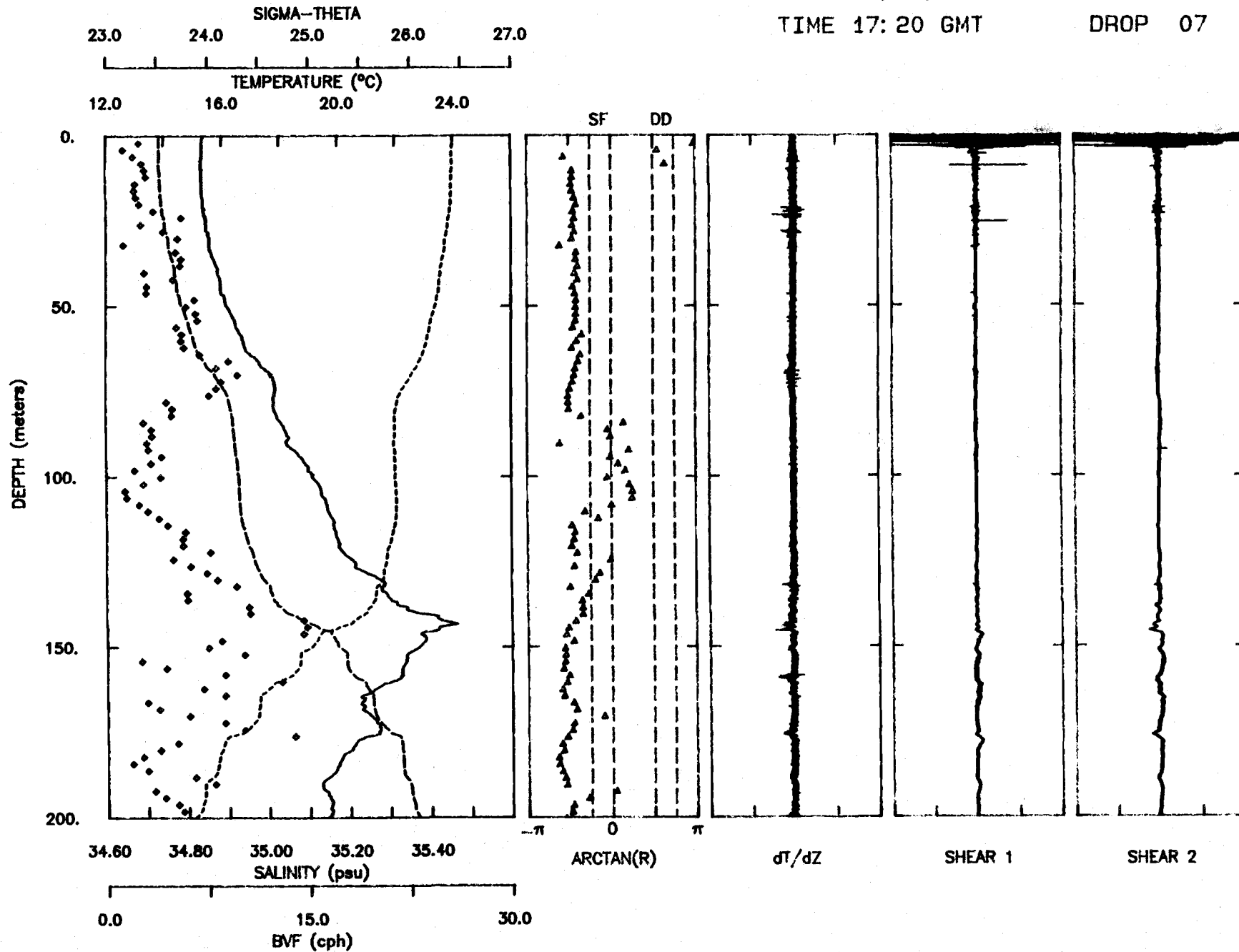
DATE 11/21/84
TIME 16:05 GMT

TAPE 89
DROP 01



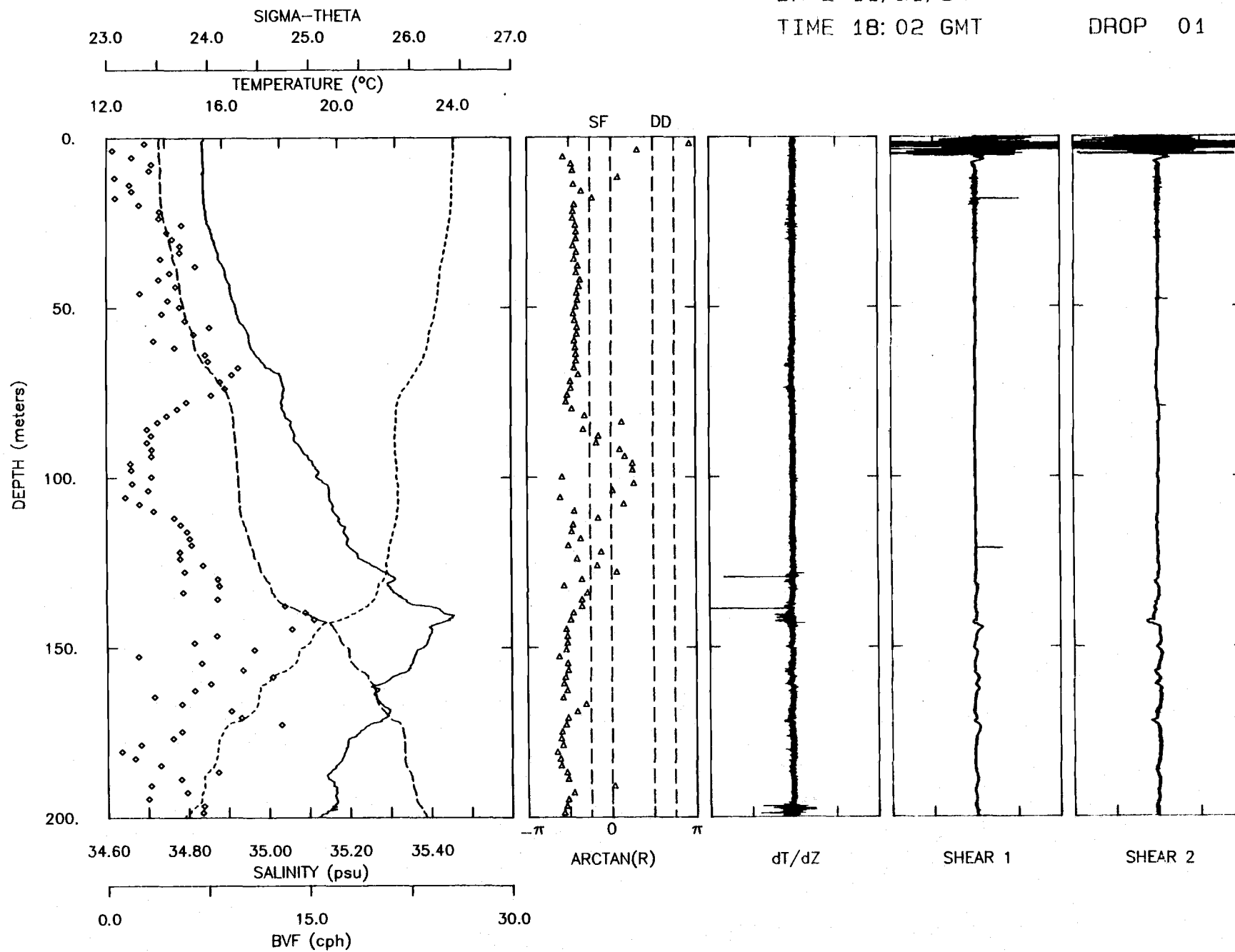
DATE 11/21/84
TIME 17:20 GMT

TAPE 89
DROP 07



DATE 11/21/84
TIME 18:02 GMT

TAPE 90
DROP 01

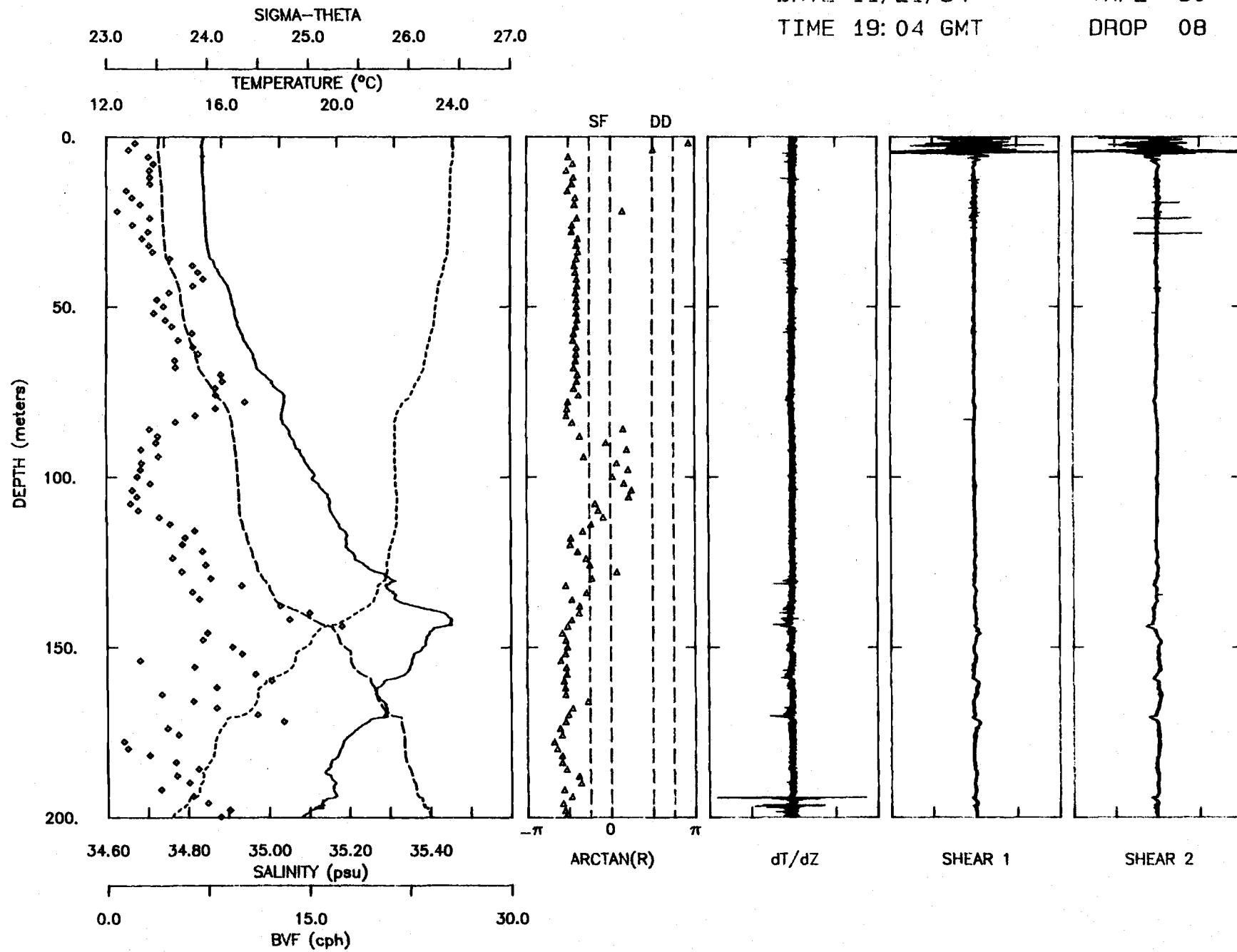


DATE 11/21/84

TAPE 90

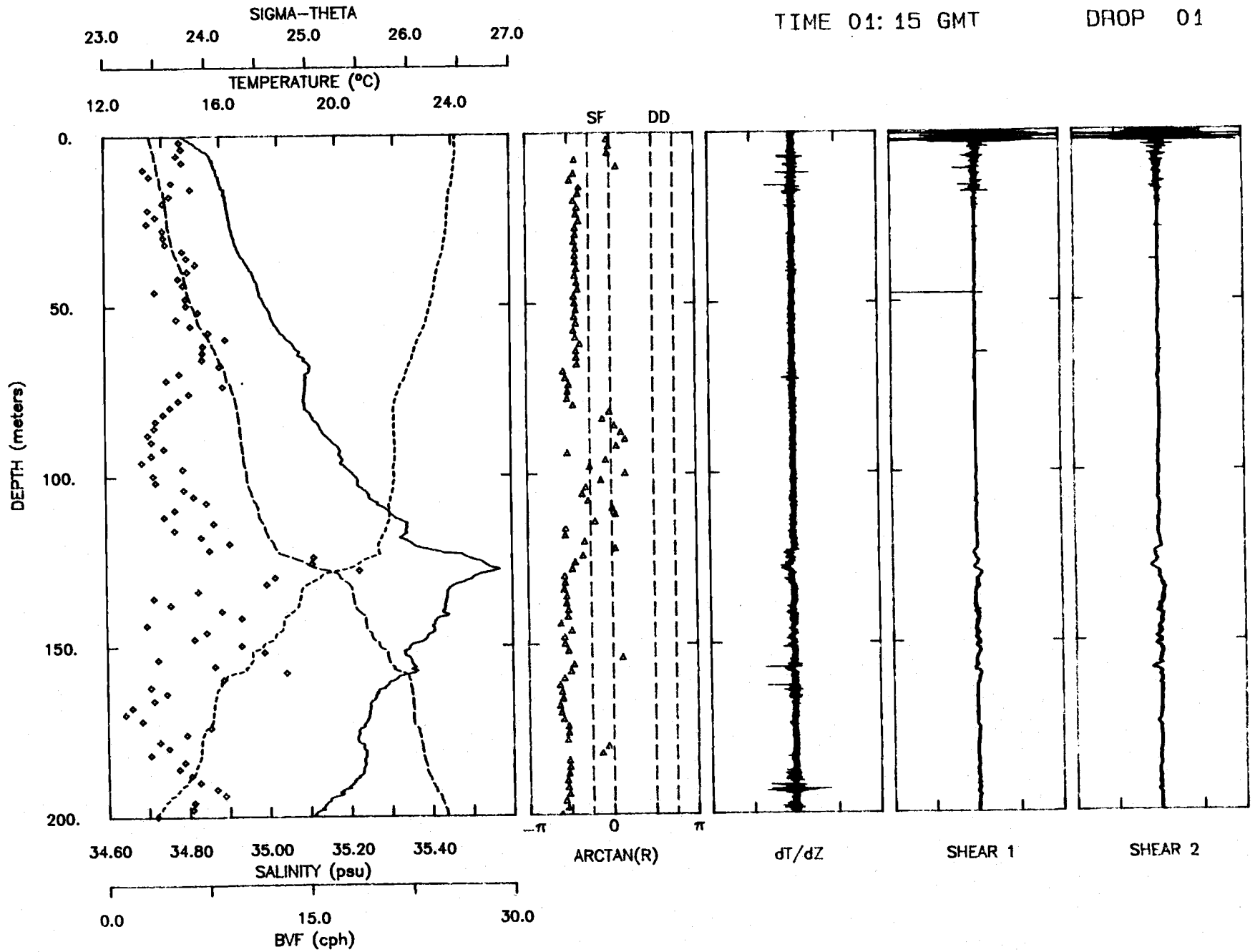
TIME 19:04 GMT

DROP 08



DATE 11/22/84
TIME 01:15 GMT

TAPE 94
DROP 01

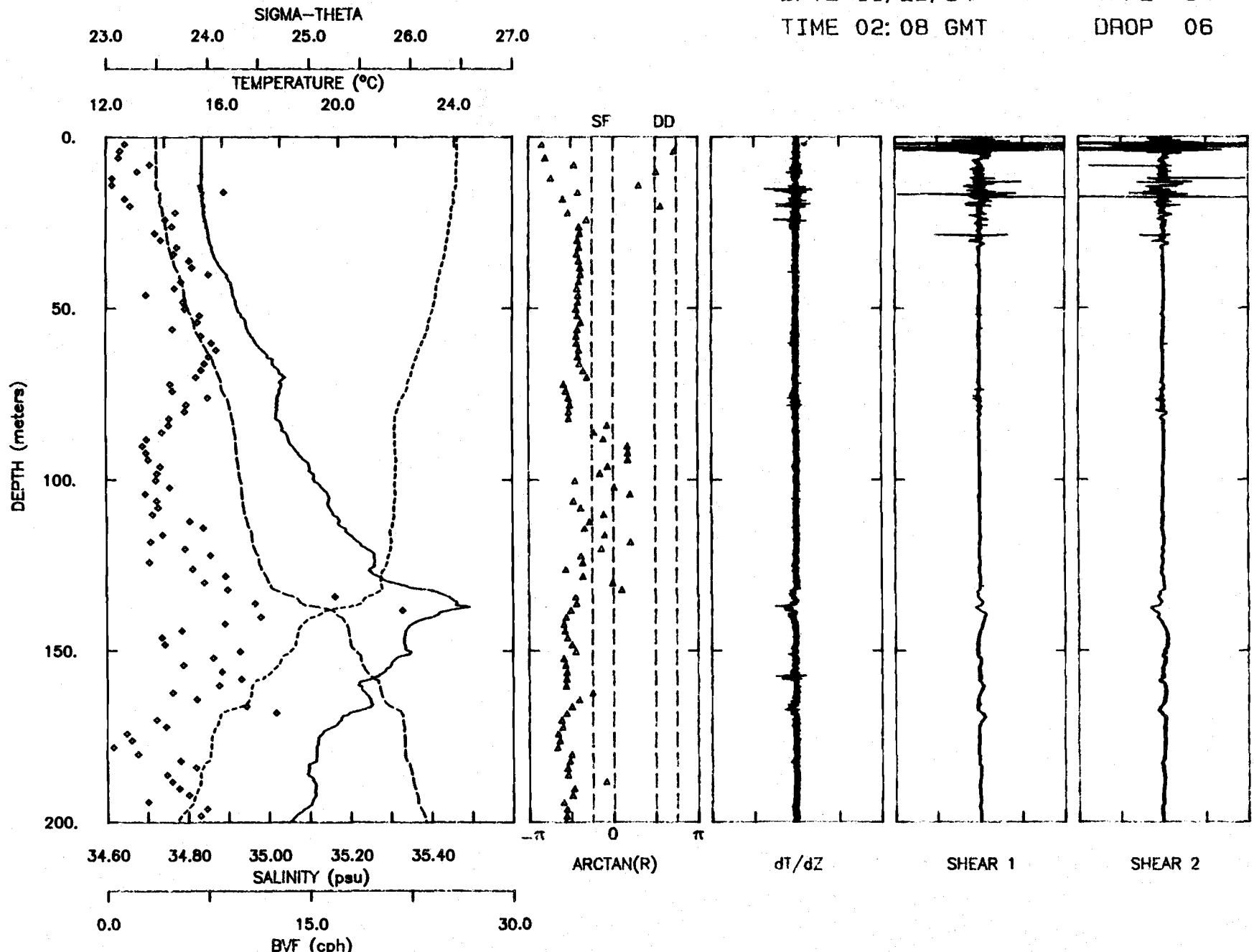


DATE 11/22/84

TAPE 94

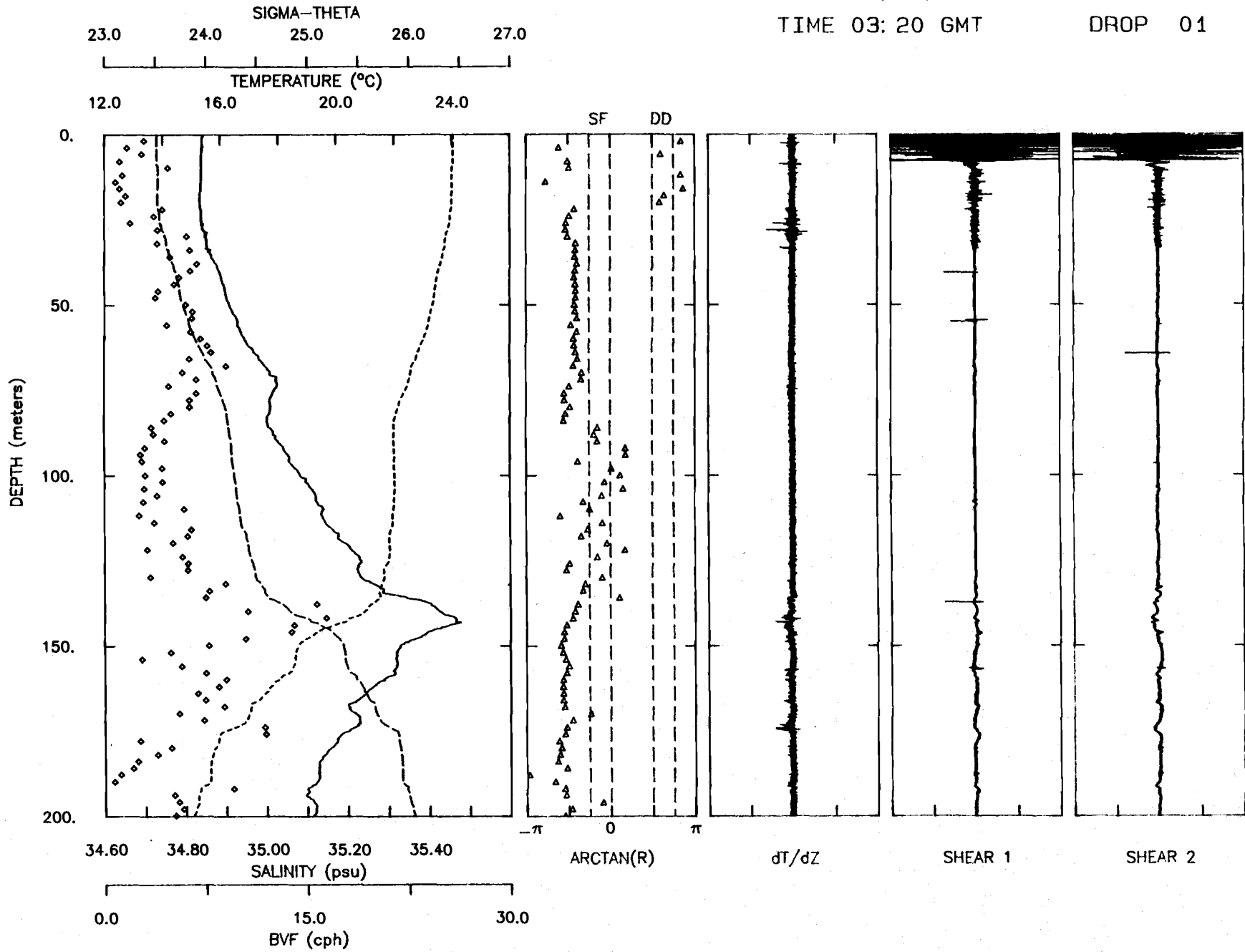
TIME 02:08 GMT

DROP 06



DATE 11/22/84
TIME 03:20 GMT

TAPE 95
DROP 01

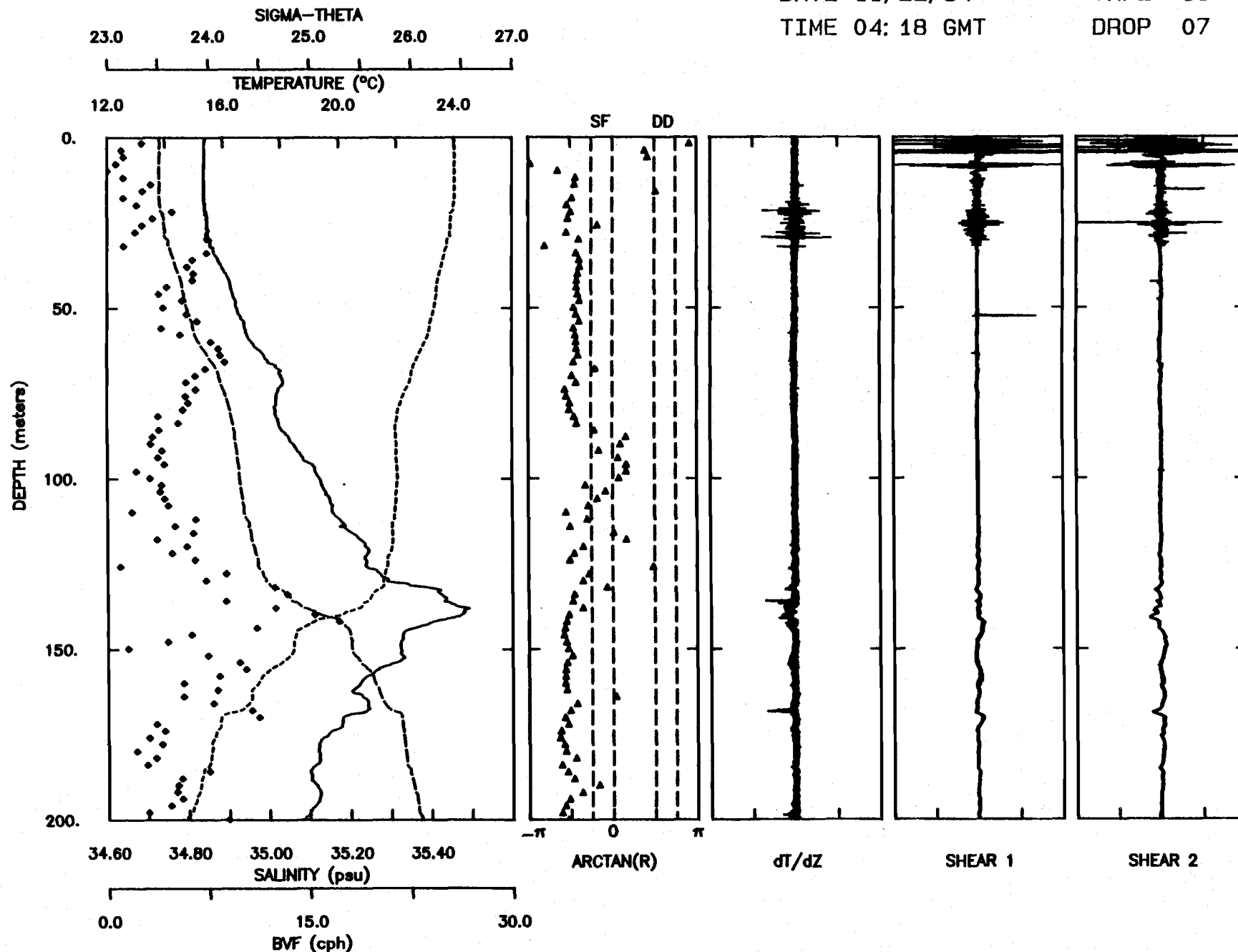


DATE 11/22/84

TAPE 95

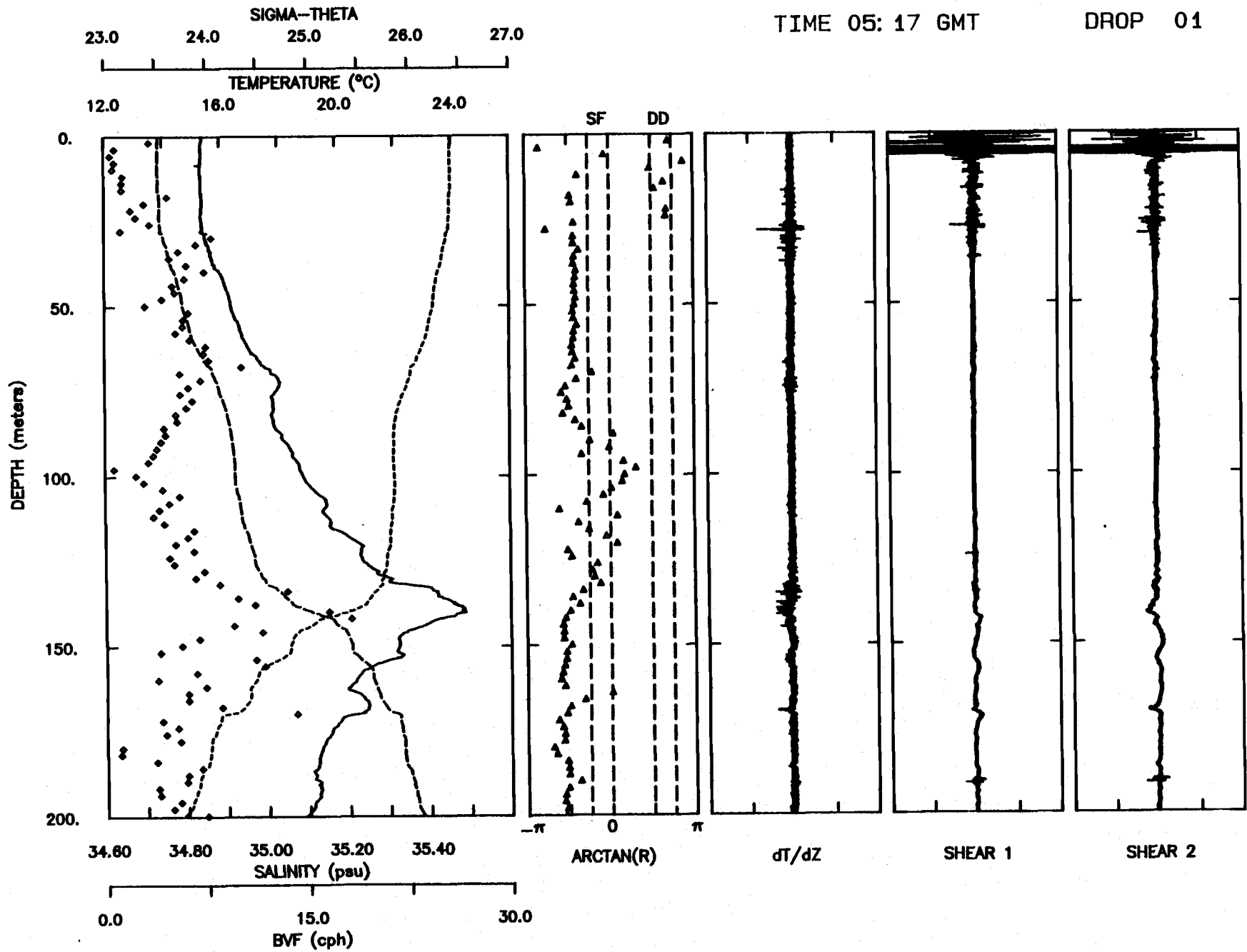
TIME 04:18 GMT

DROP 07



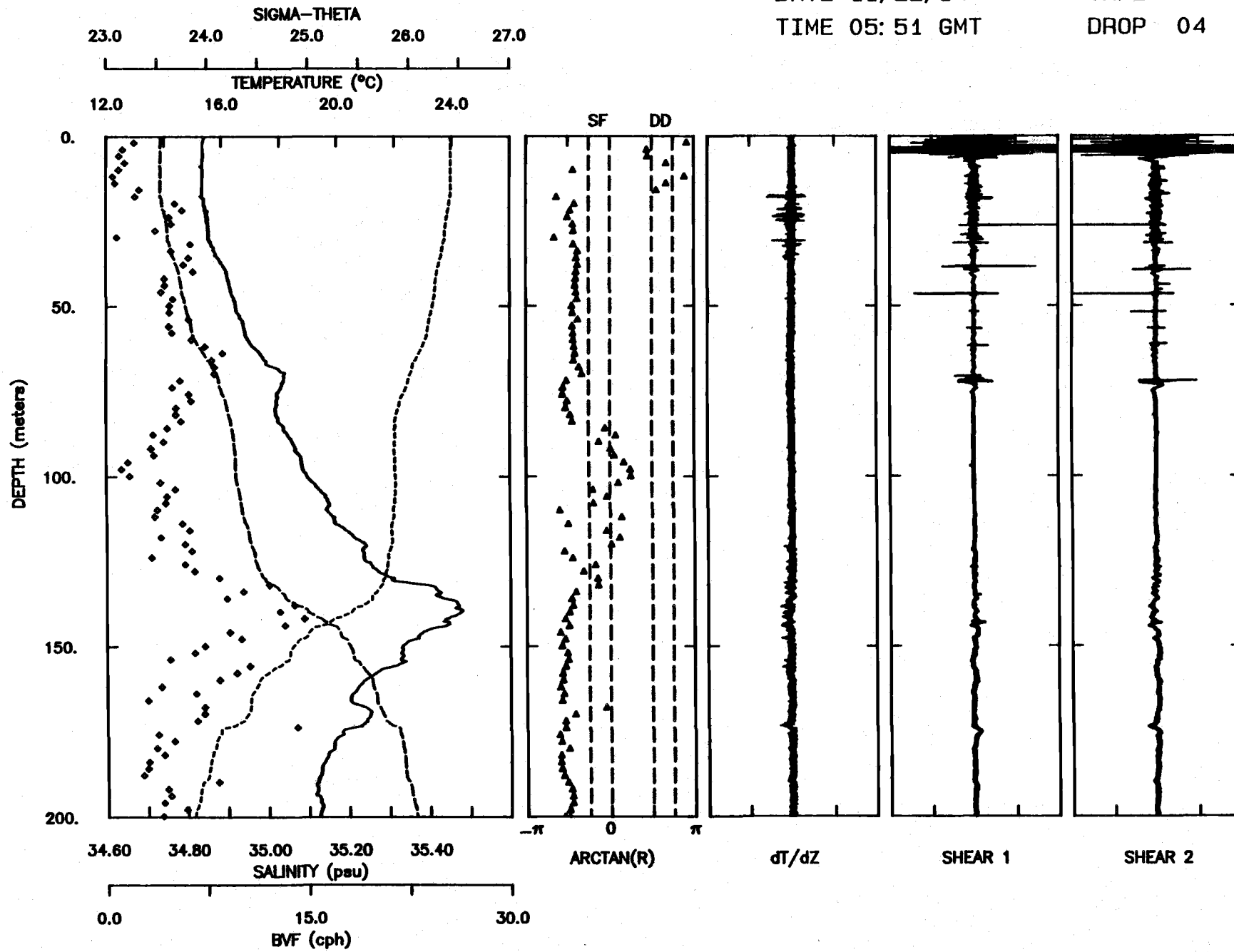
DATE 11/22/84
TIME 05:17 GMT

TAPE 96
DROP 01



DATE 11/22/84
TIME 05: 51 GMT

TAPE 96
DROP 04

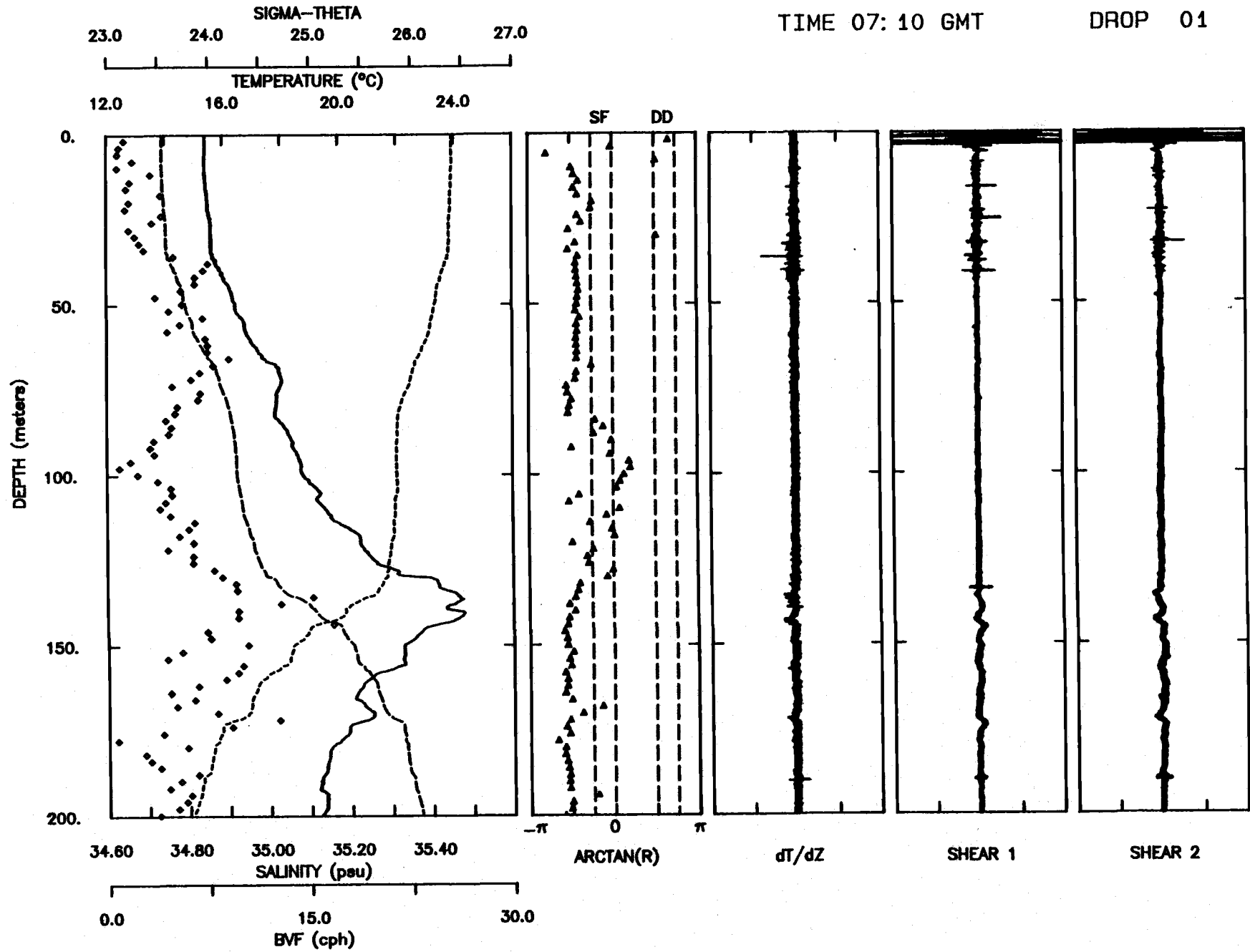


DATE 11/22/84

TAPE 97

TIME 07:10 GMT

DROP 01

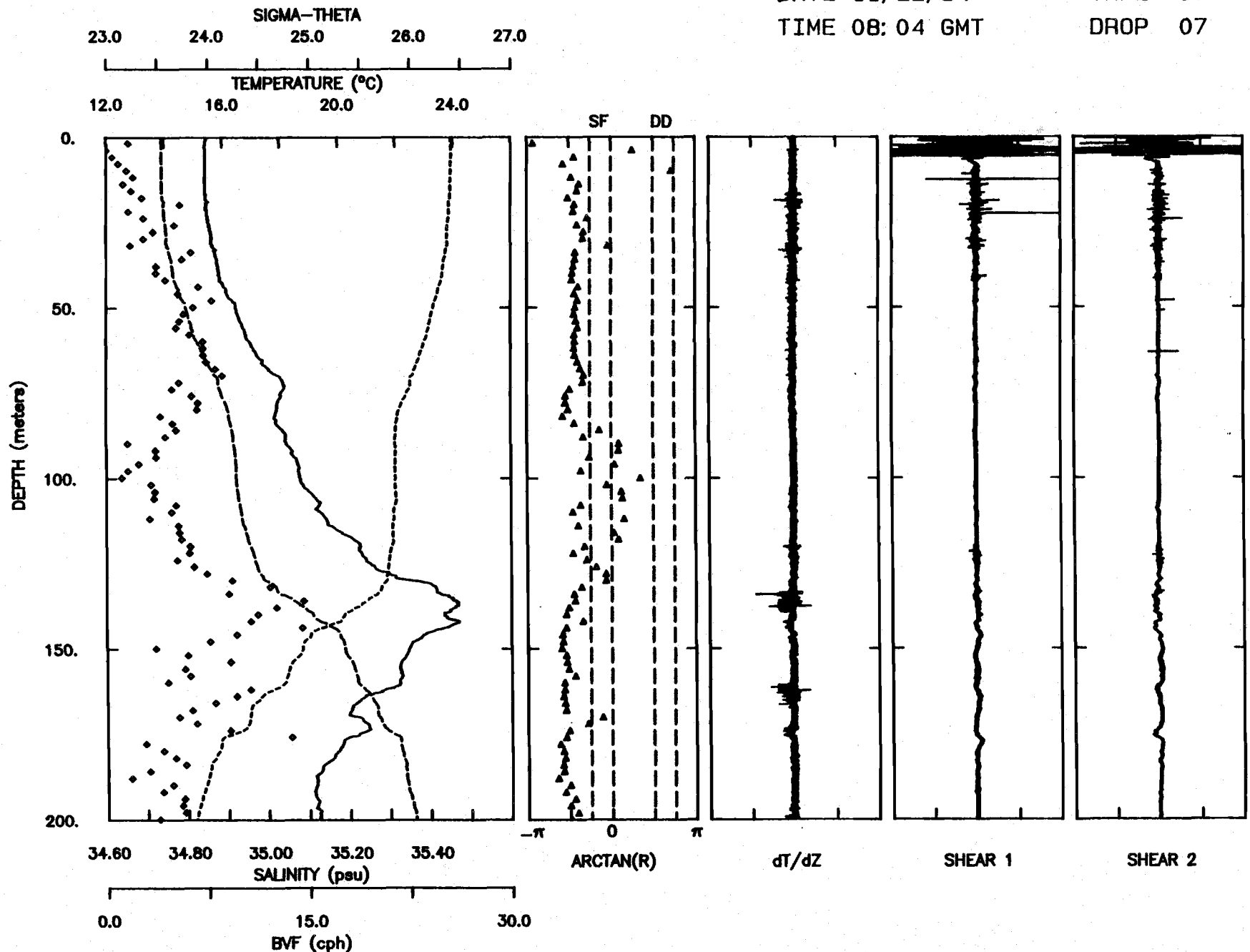


DATE 11/22/84

TAPE 97

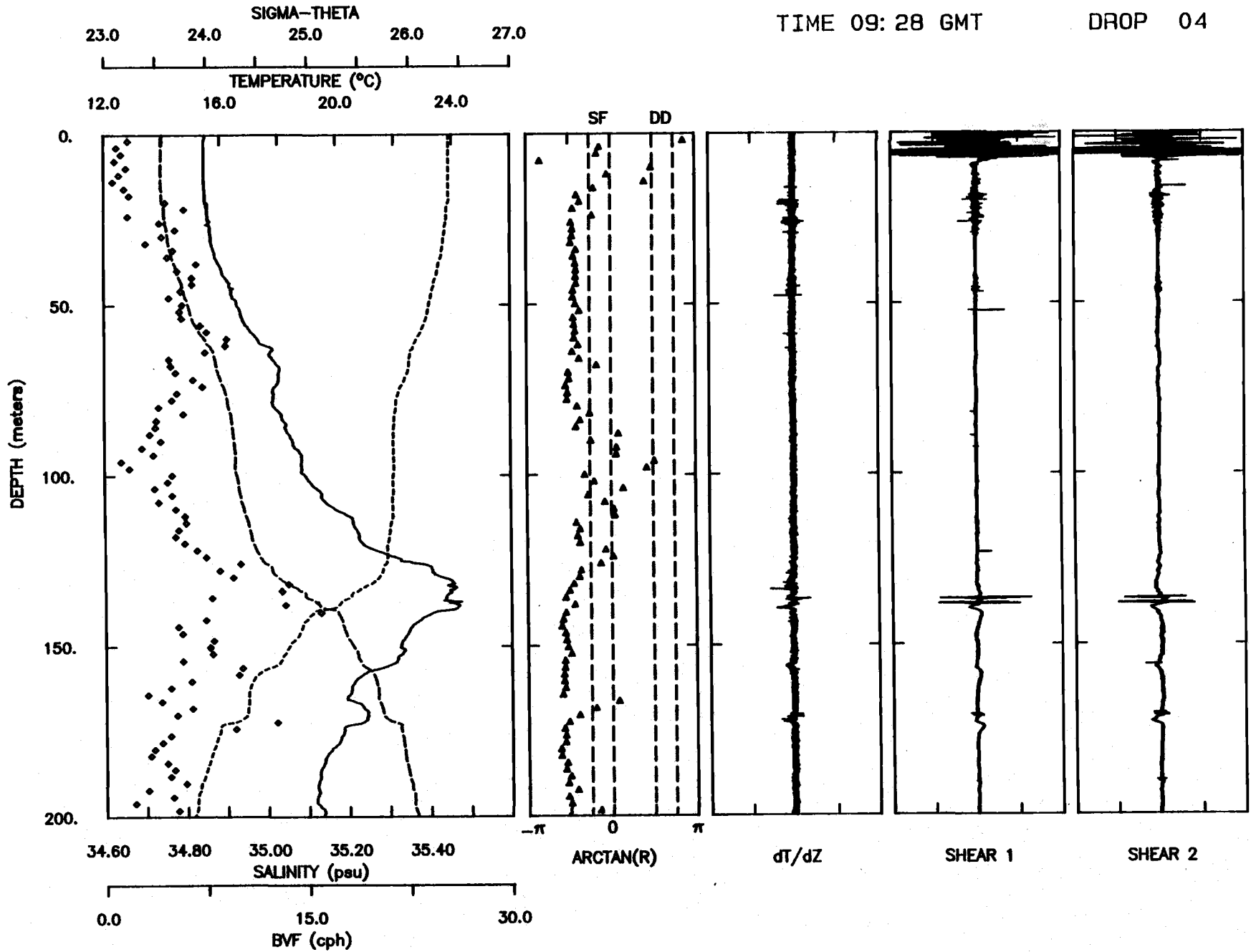
TIME 08:04 GMT

DROP 07



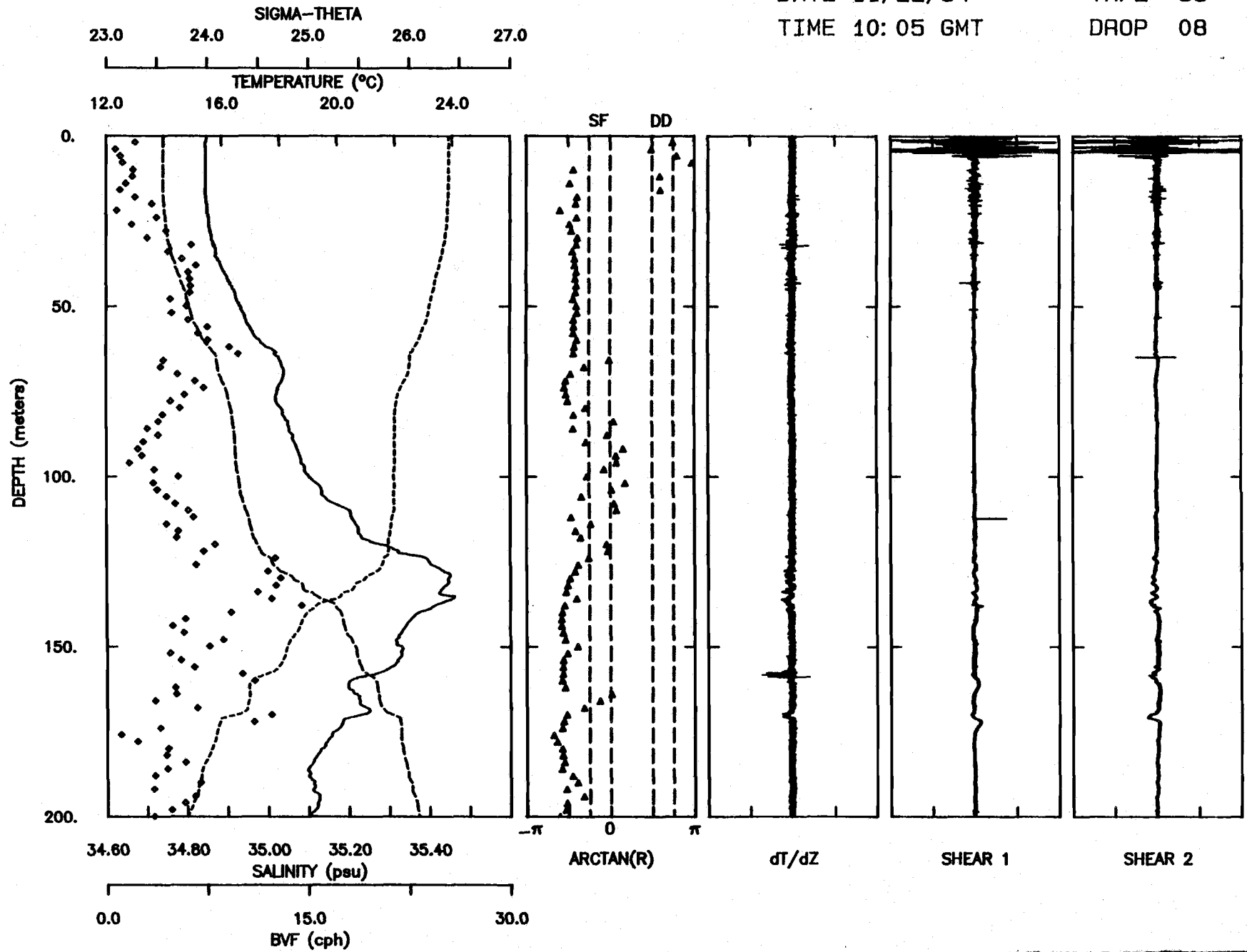
DATE 11/22/84
TIME 09:28 GMT

TAPE 98
DROP 04



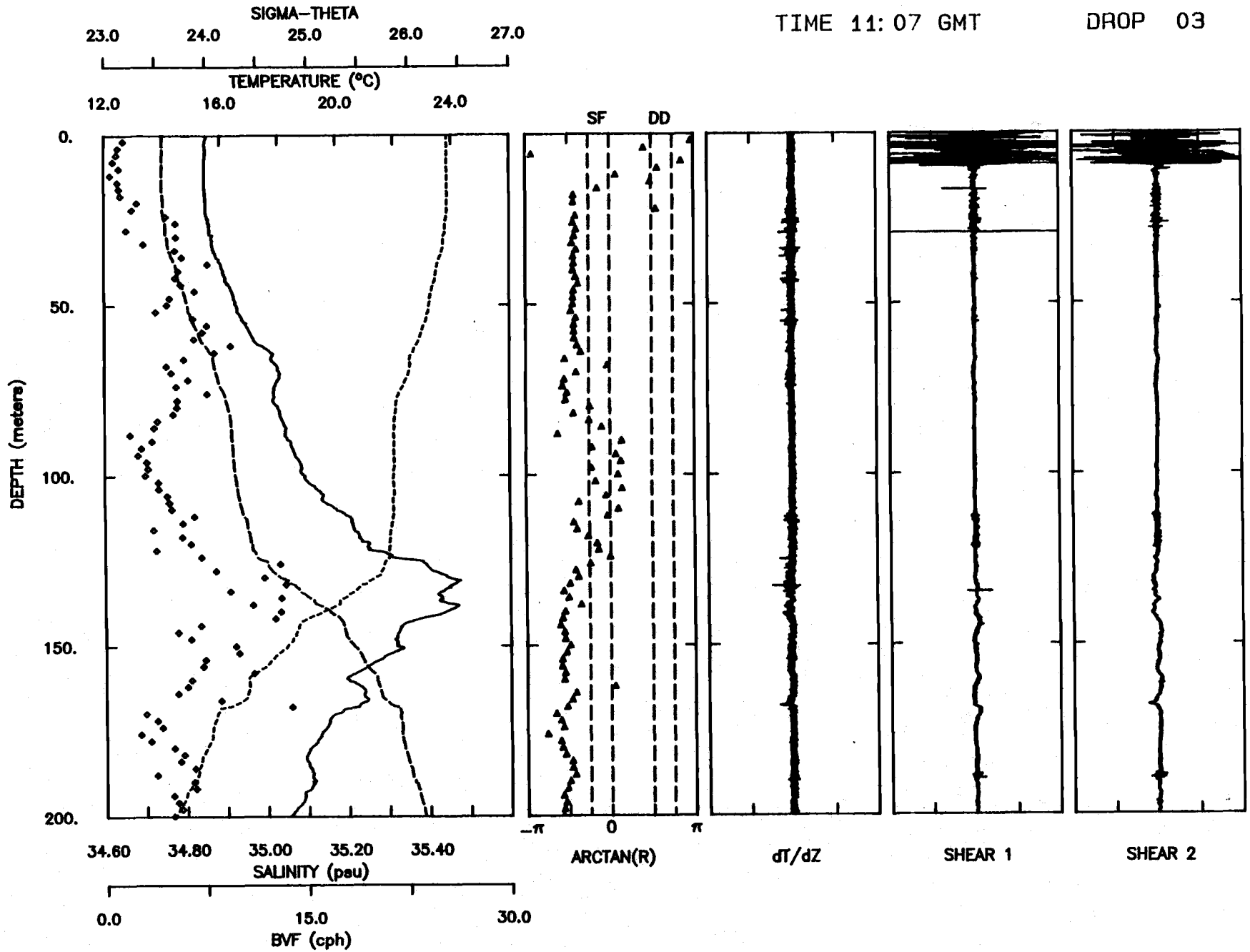
DATE 11/22/84
TIME 10:05 GMT

TAPE 98
DROP 08



DATE 11/22/84
TIME 11:07 GMT

TAPE 99
DROP 03

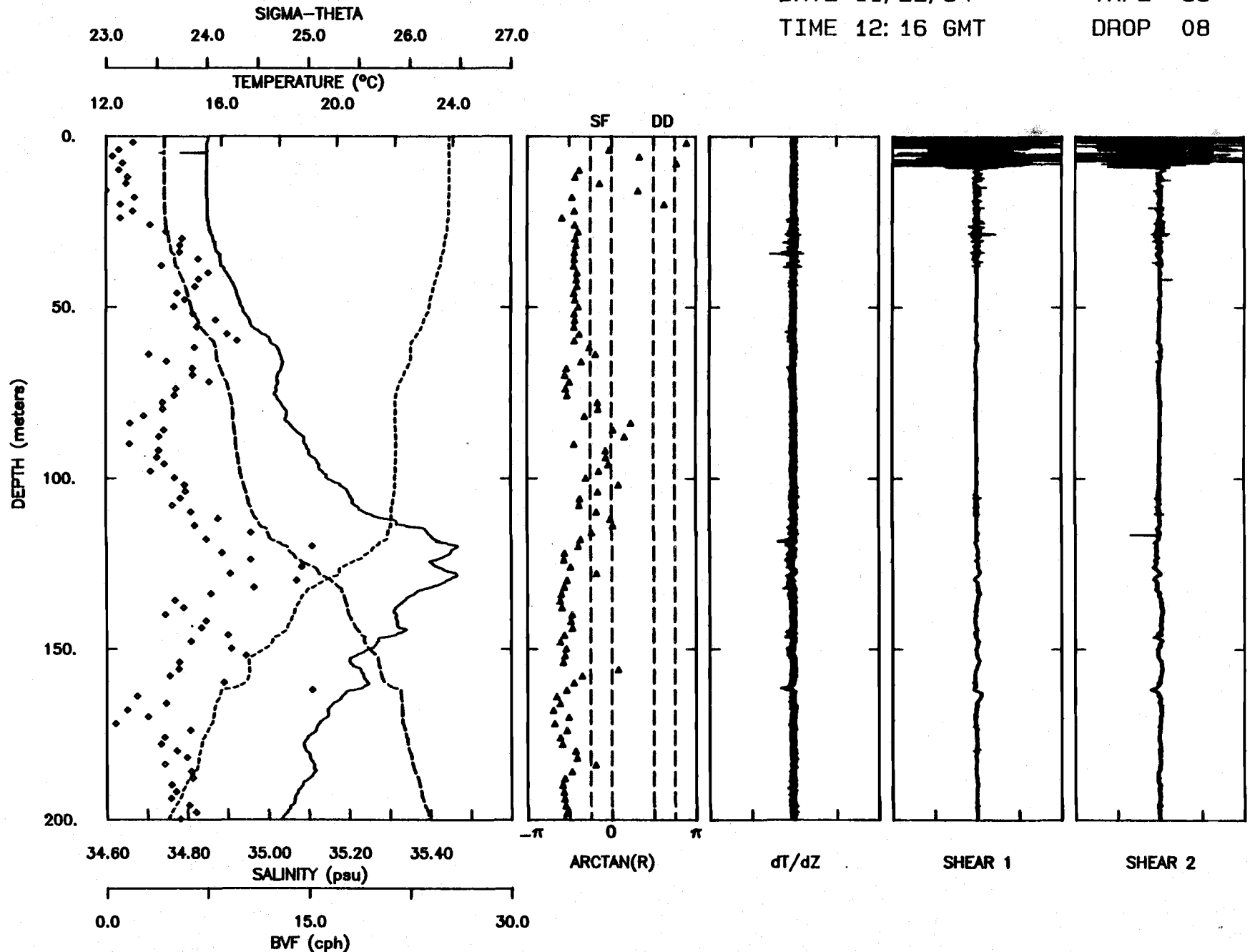


DATE 11/22/84

TAPE 99

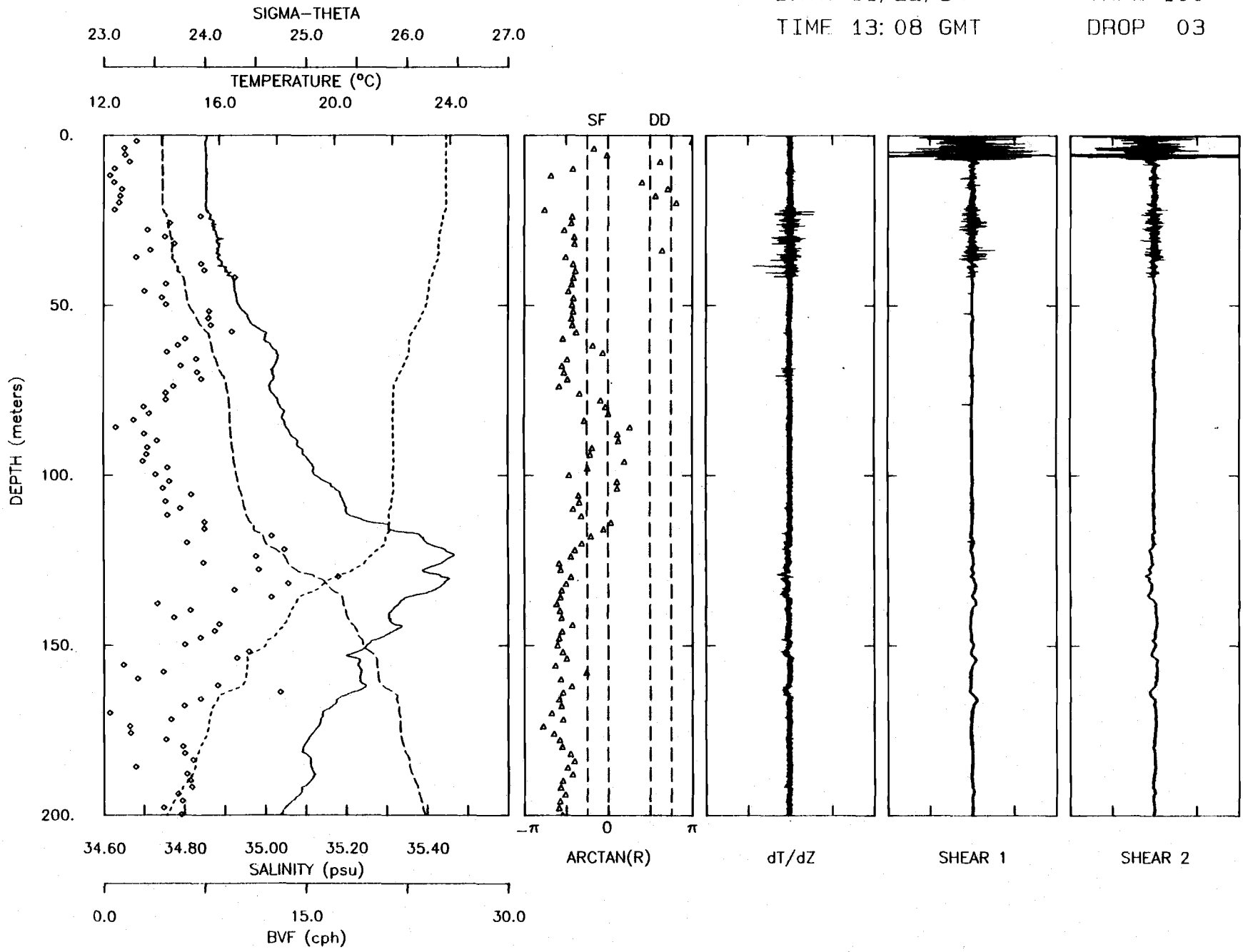
TIME 12:16 GMT

DROP 08



DATE 11/22/84
TIME 13:08 GMT

TAPE 100
DROP 03

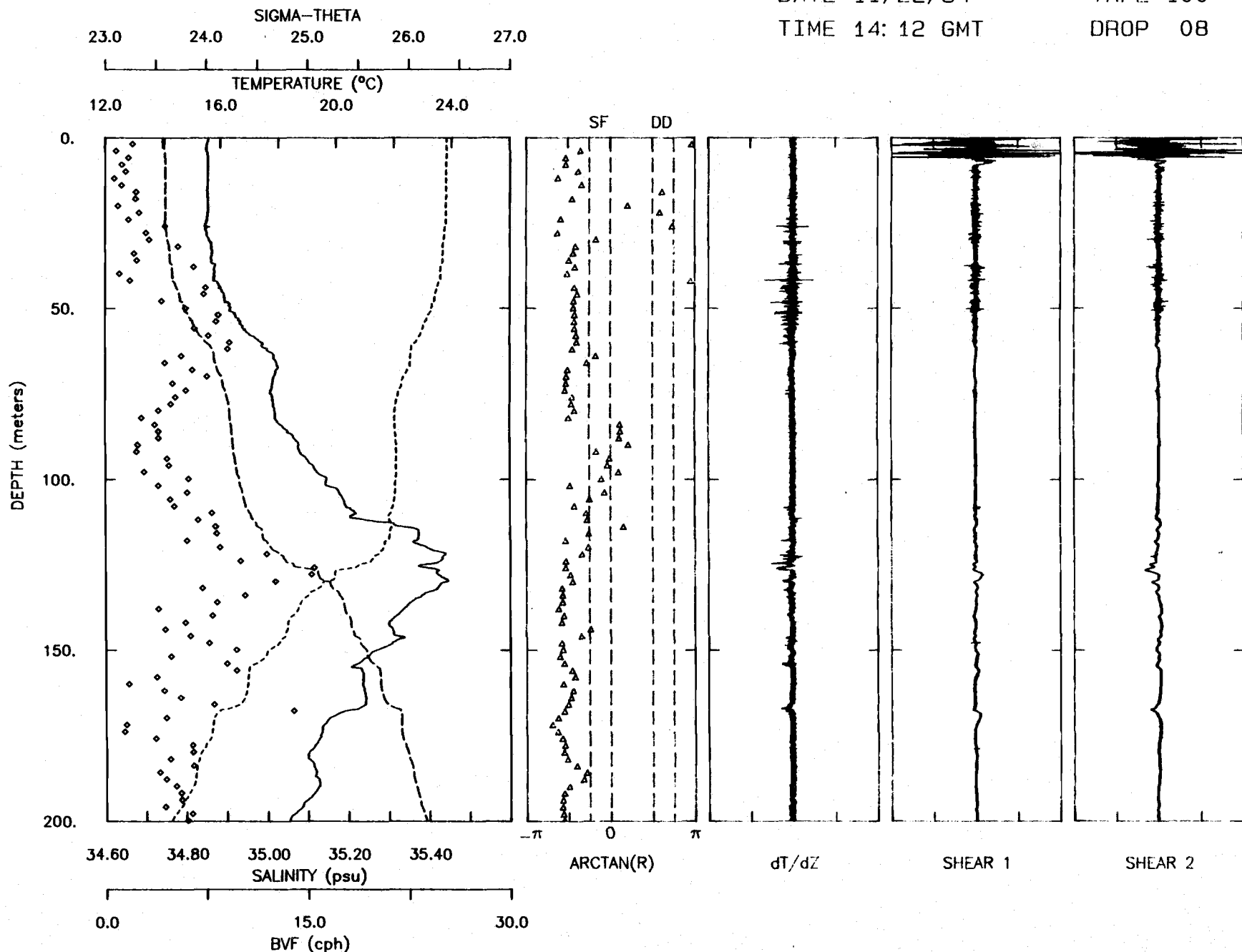


DATE 11/22/84

TAPE 100

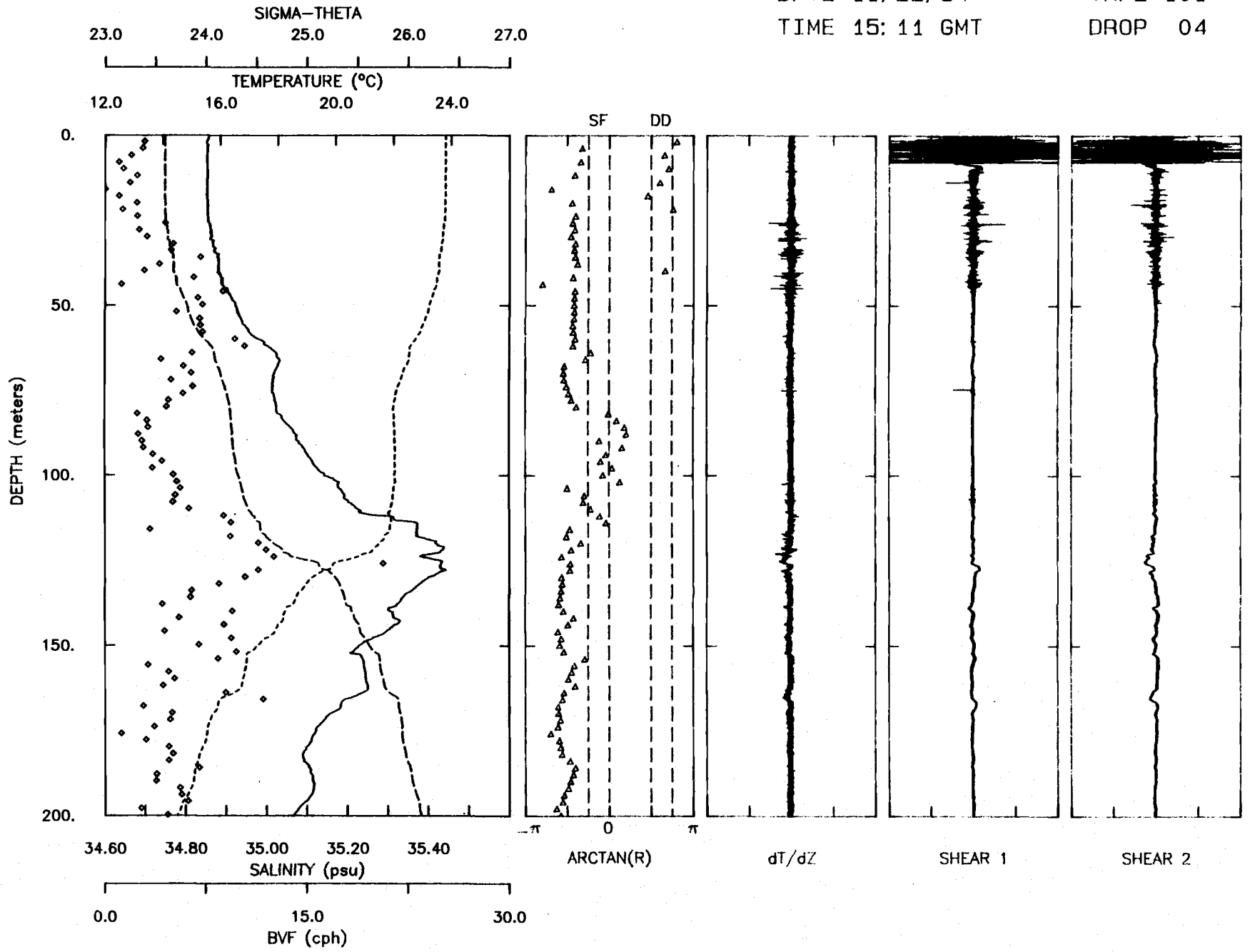
TIME 14:12 GMT

DROP 08



DATE 11/22/84
TIME 15:11 GMT

TAPE 101
DROP 04

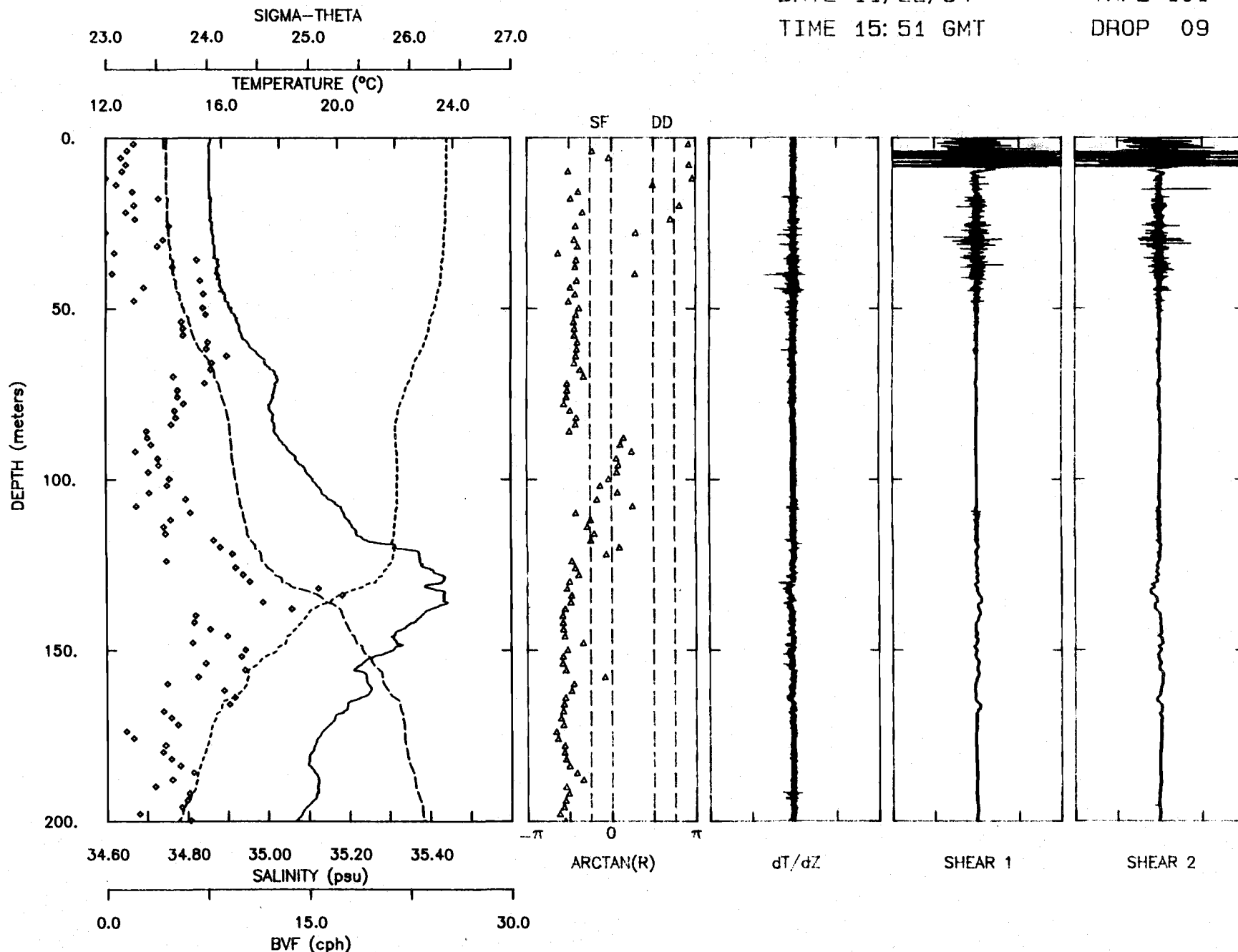


DATE 11/22/84

TAPE 101

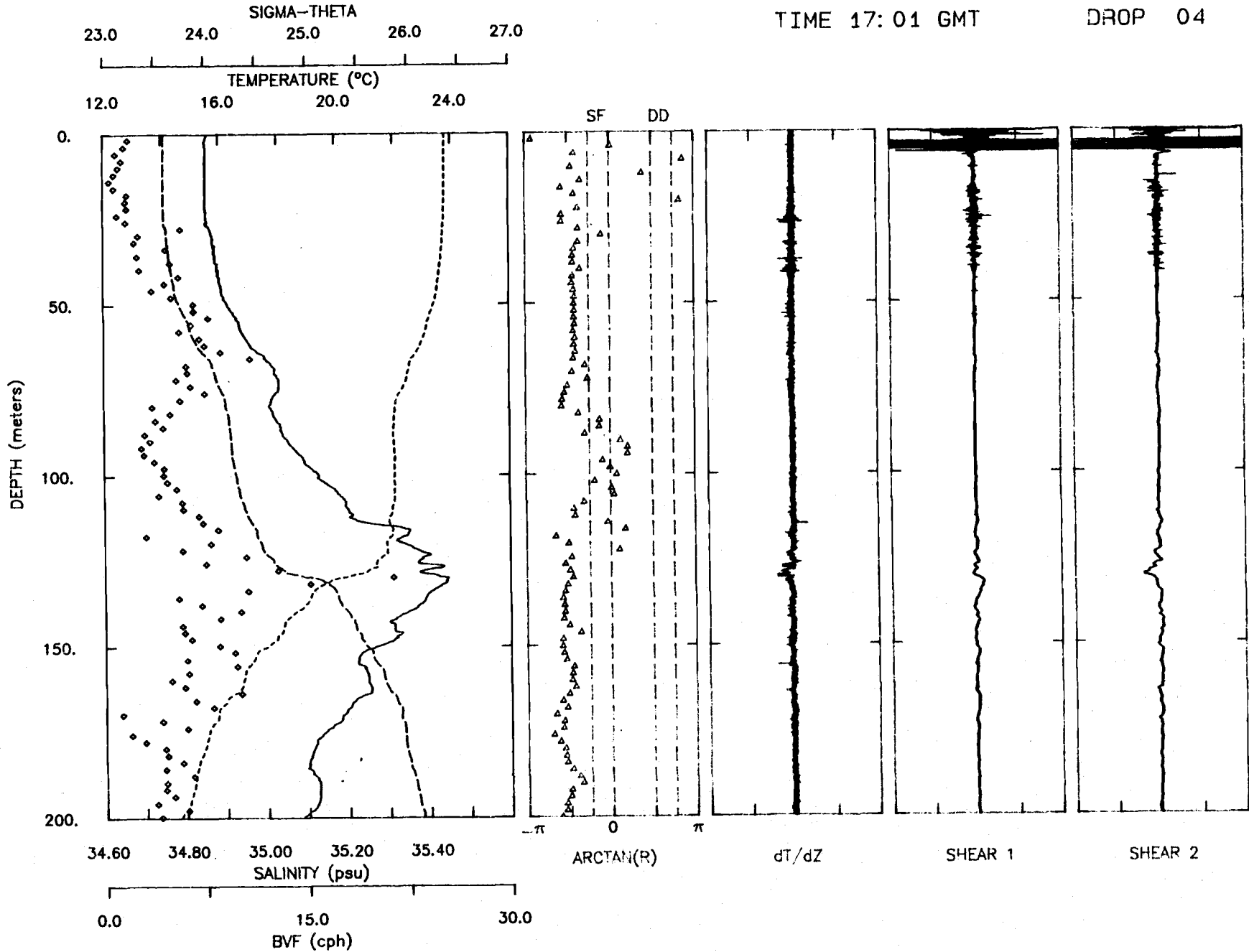
TIME 15:51 GMT

DROP 09



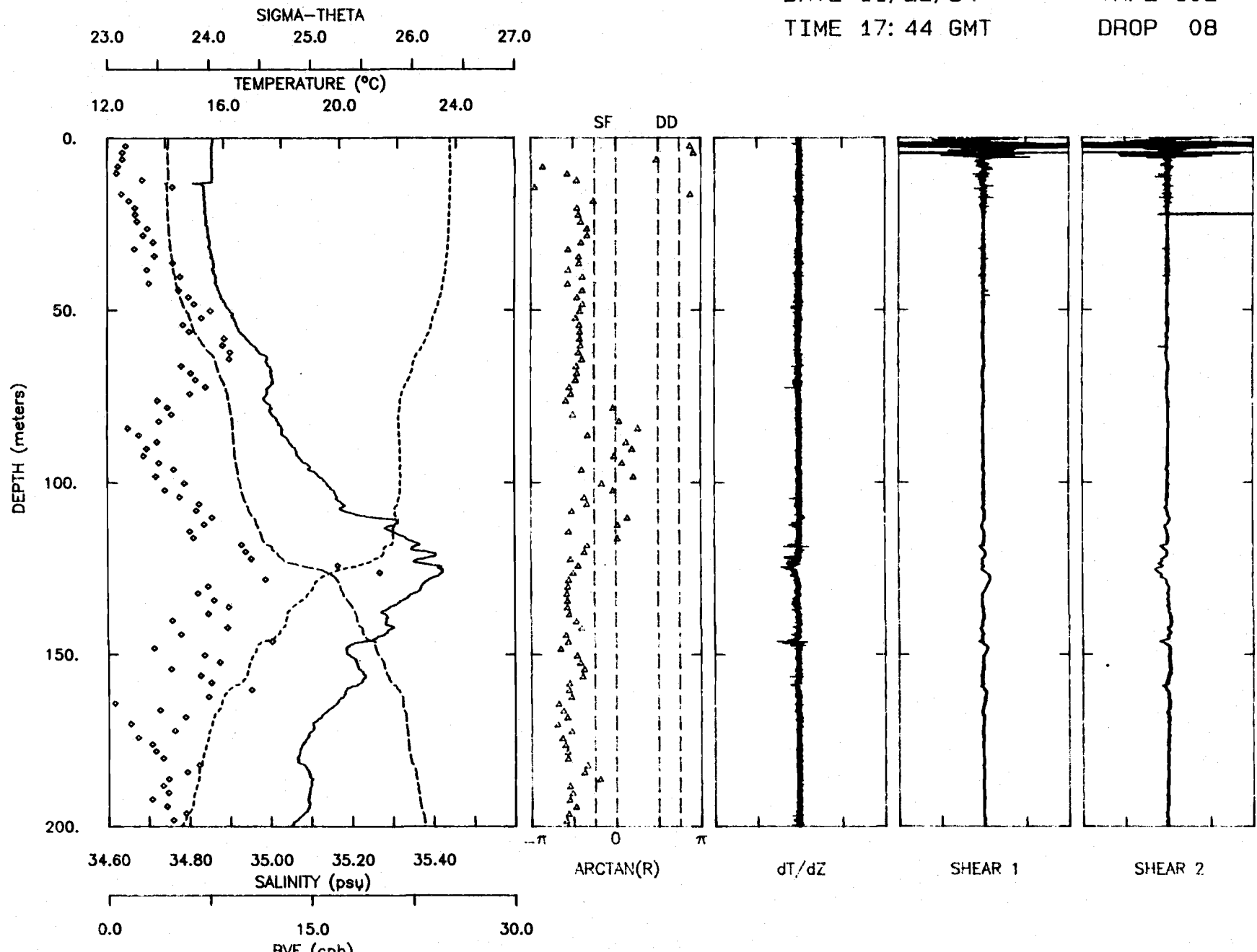
DATE 11/22/84
TIME 17:01 GMT

TAPE 102
DROP 04



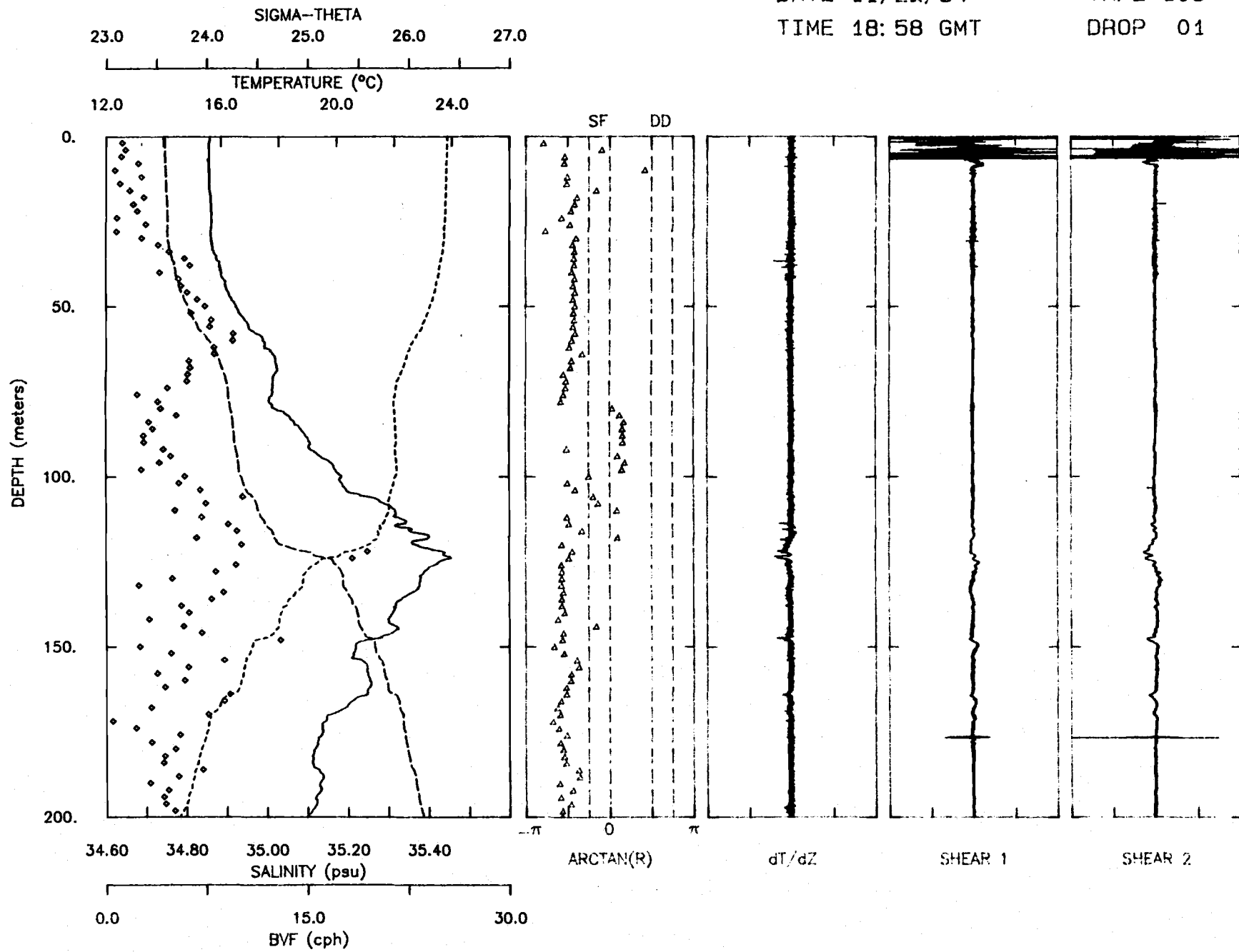
DATE 11/22/84
TIME 17: 44 GMT

TAPE 102
DROP 08



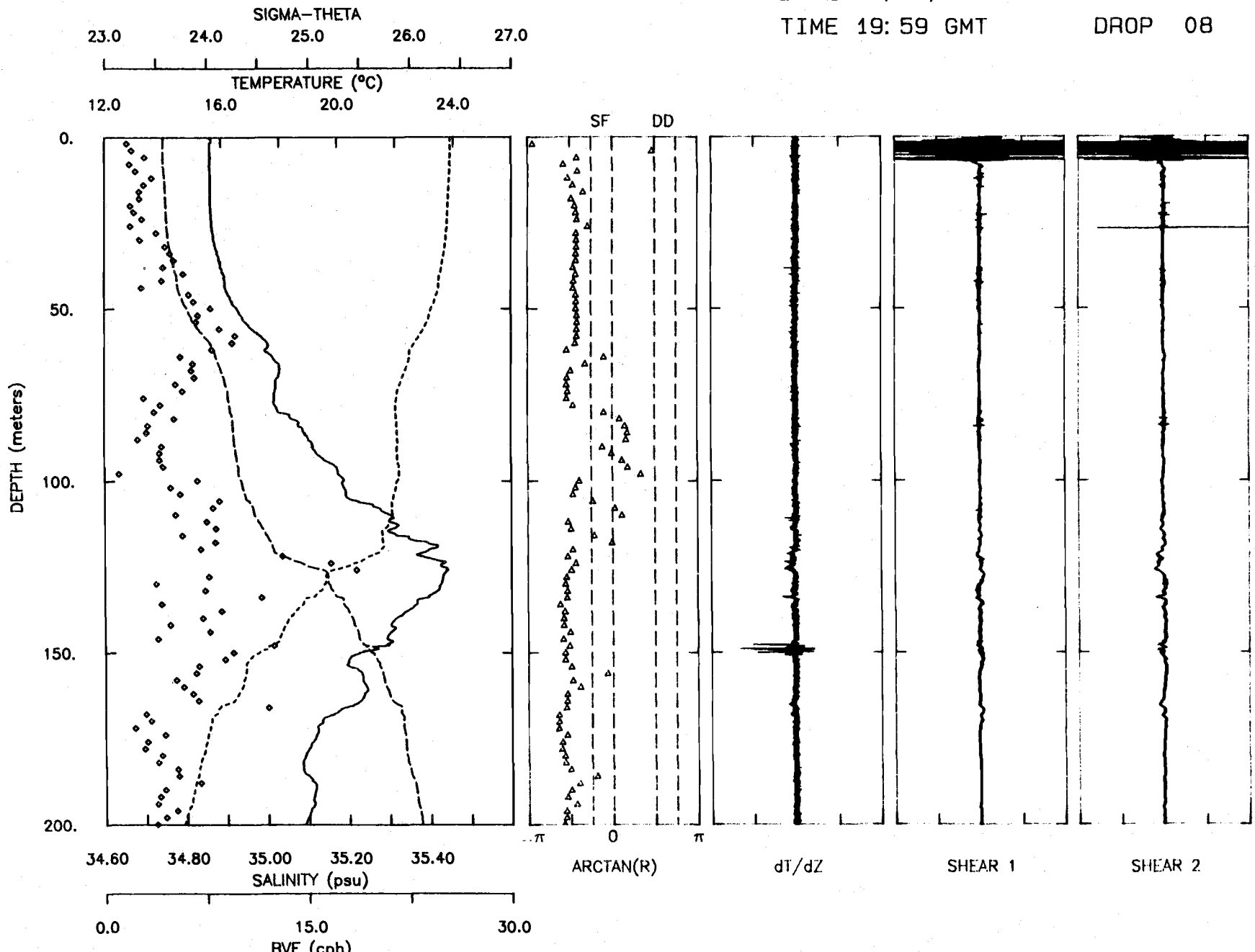
DATE 11/22/84
TIME 18:58 GMT

TAPE 103
DROP 01



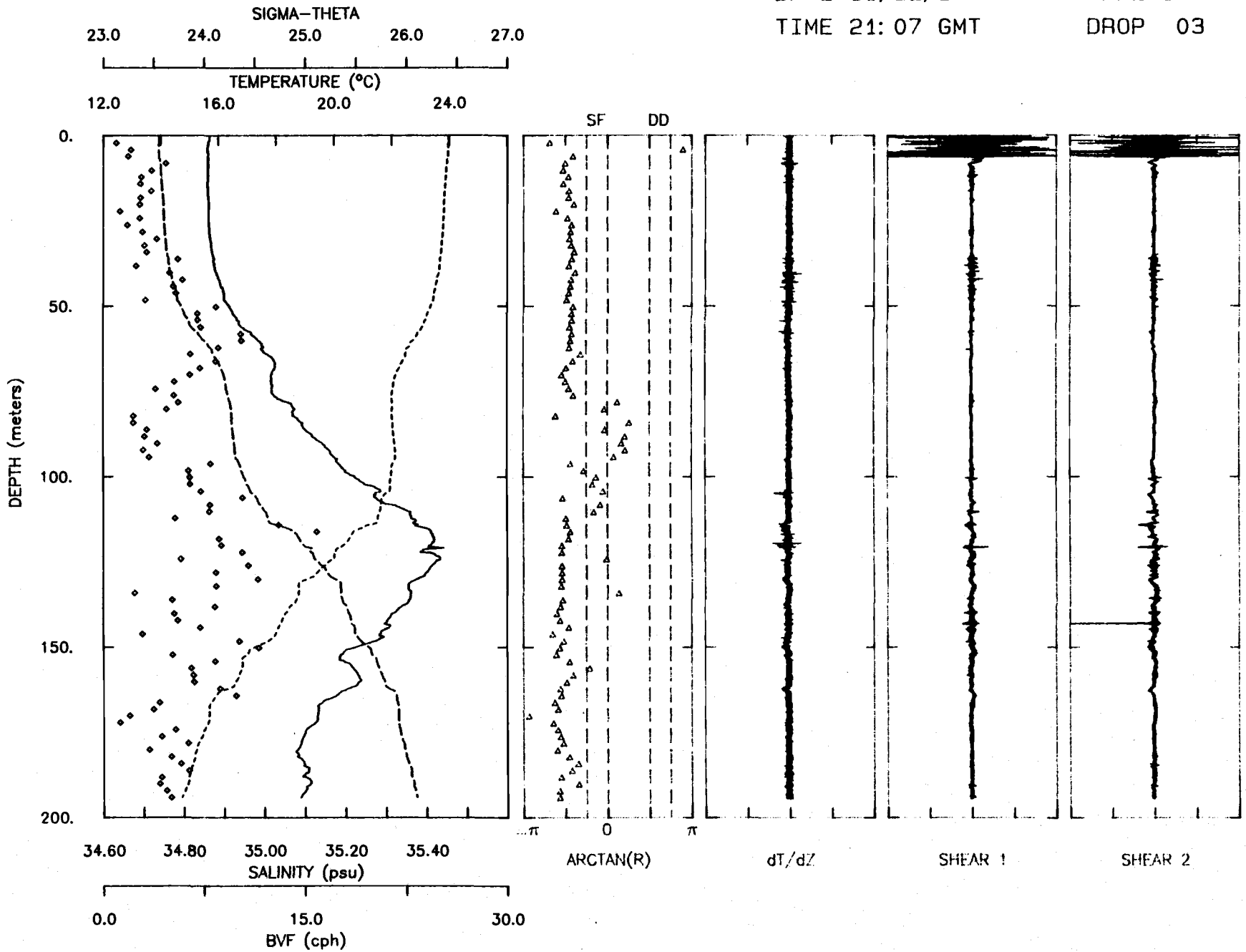
DATE 11/22/84
TIME 19:59 GMT

TAPE 103
DROP 08



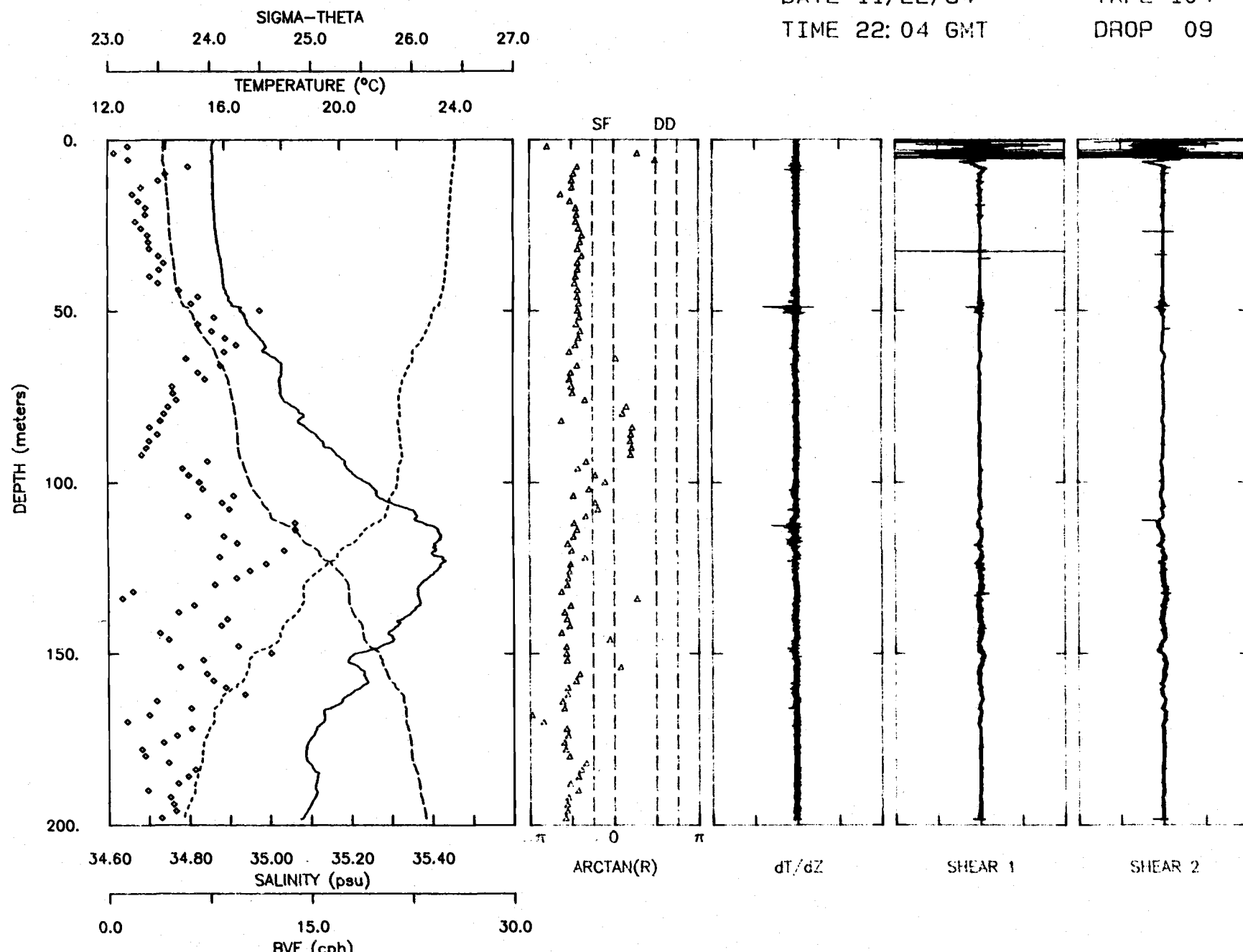
DATE 11/22/84
TIME 21:07 GMT

TAPE 104
DROP 03



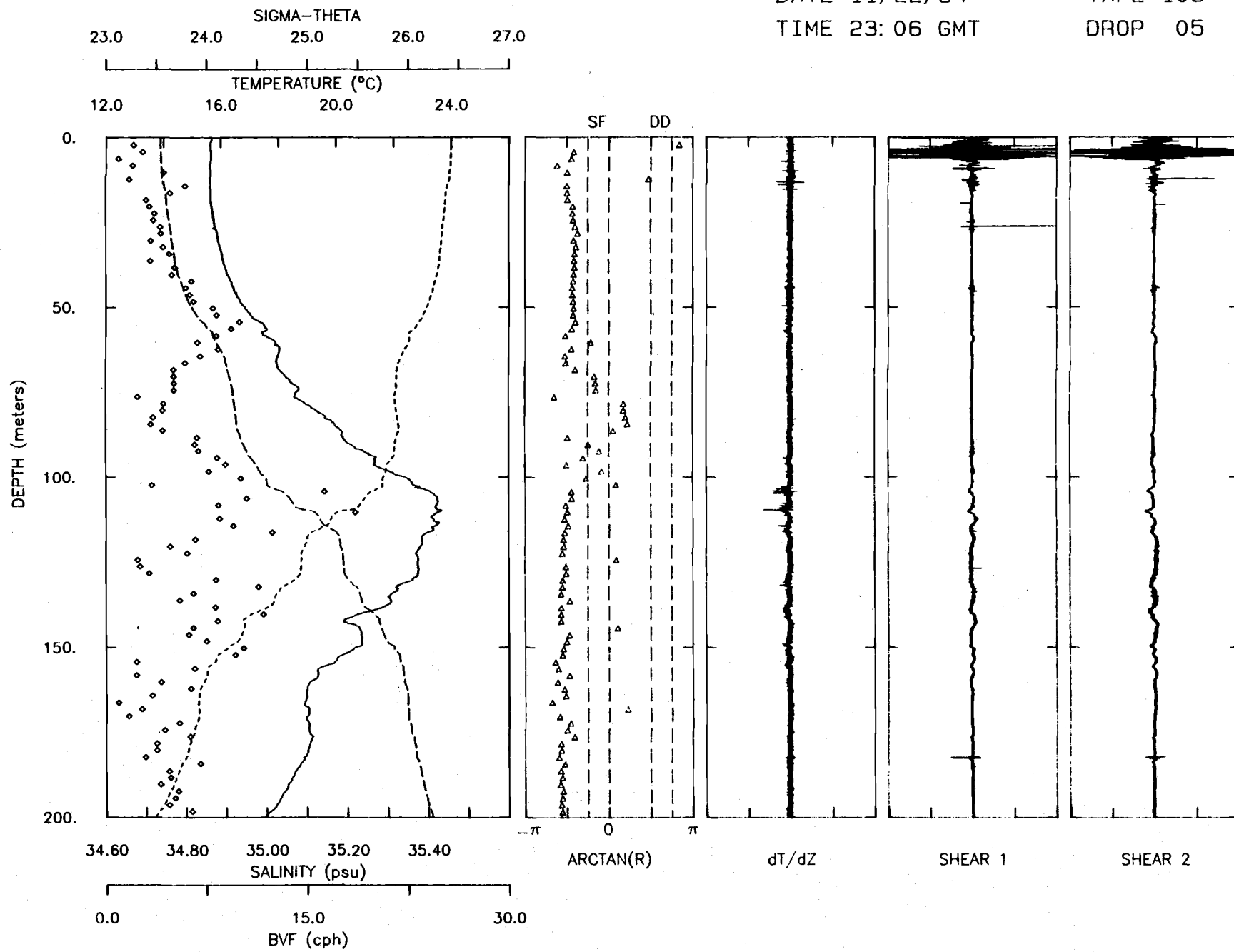
DATE 11/22/84
TIME 22:04 GMT

TAPE 104
DROP 09



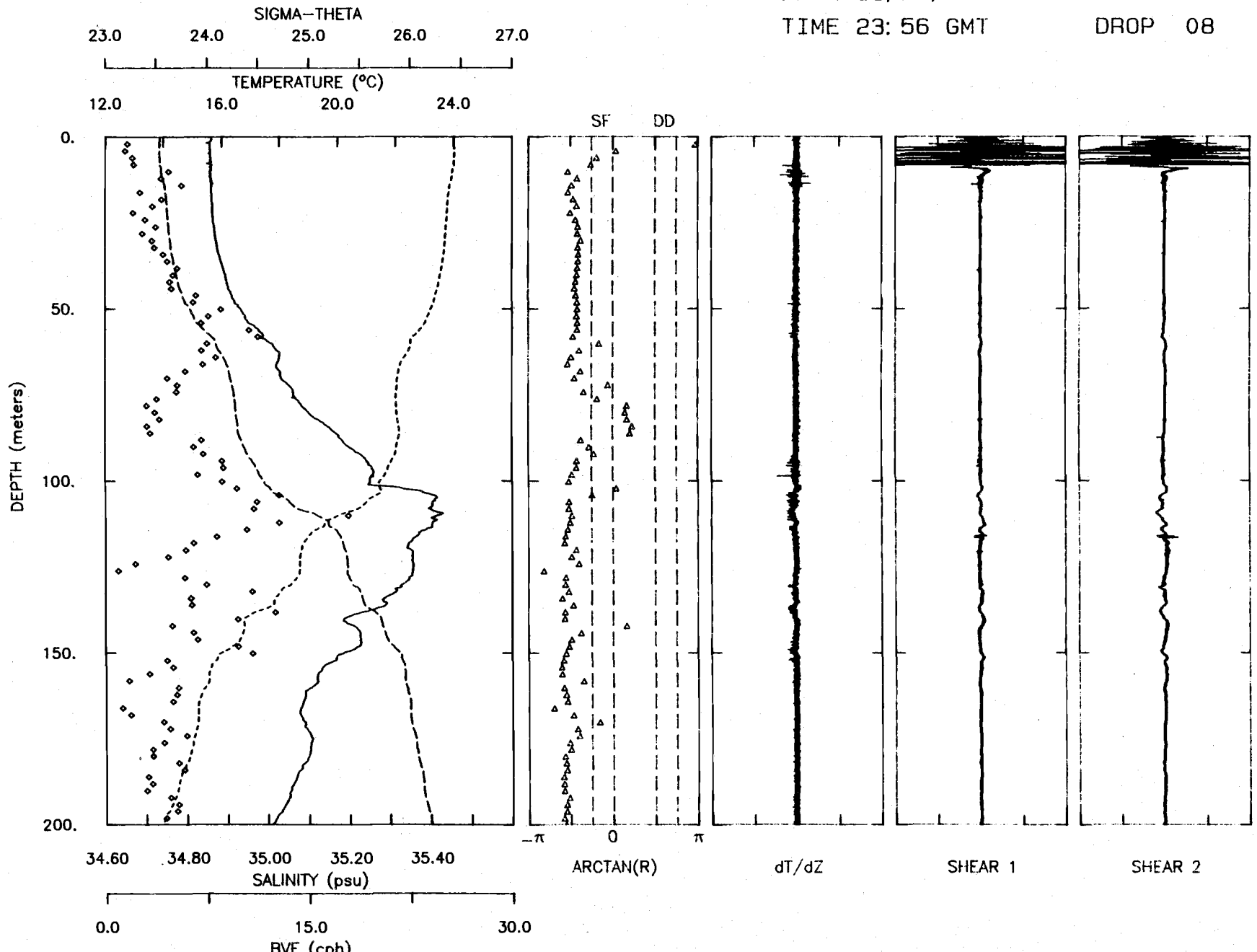
DATE 11/22/84
TIME 23:06 GMT

TAPE 105
DROP 05



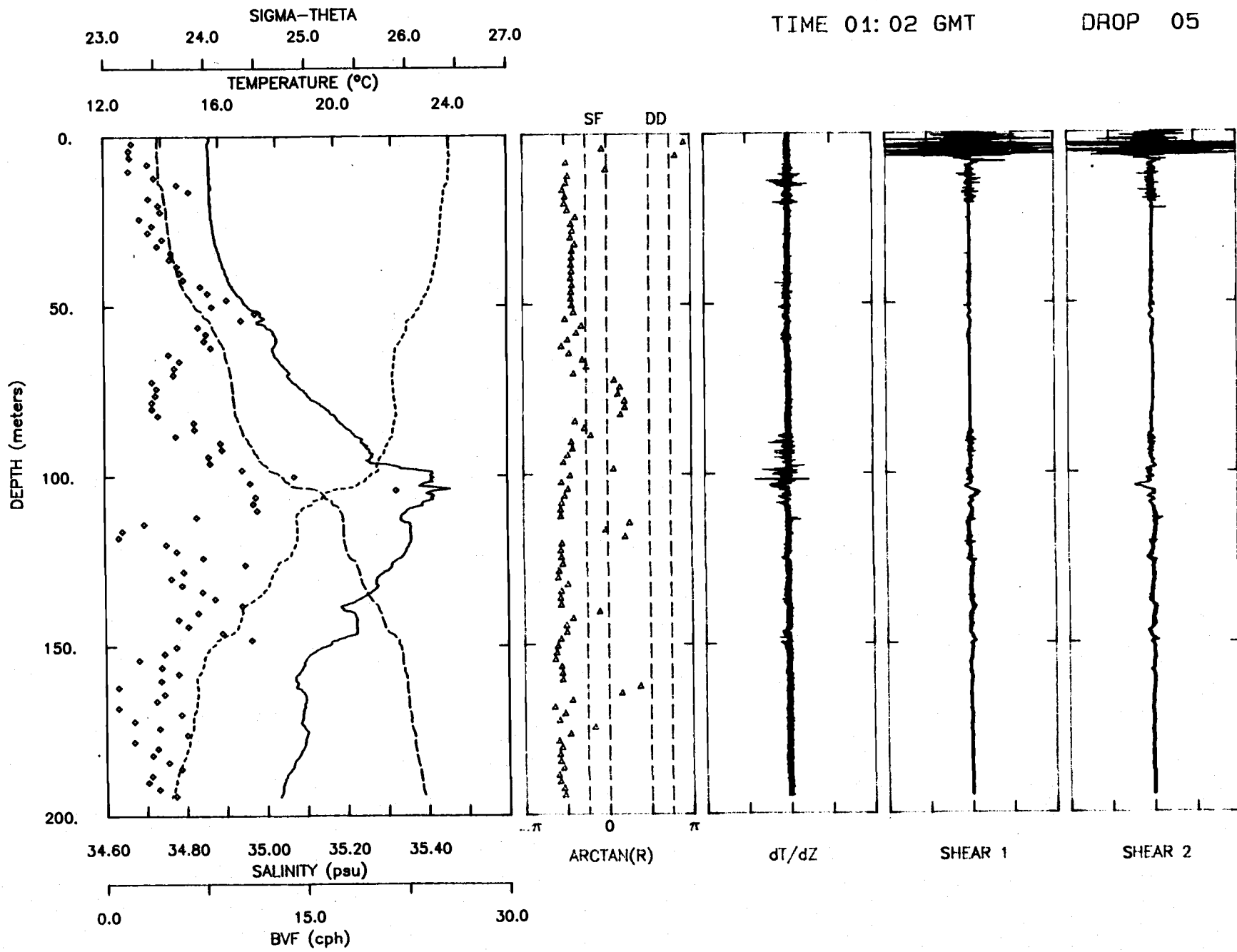
DATE 11/22/84
TIME 23:56 GMT

TAPE 105
DROP 08



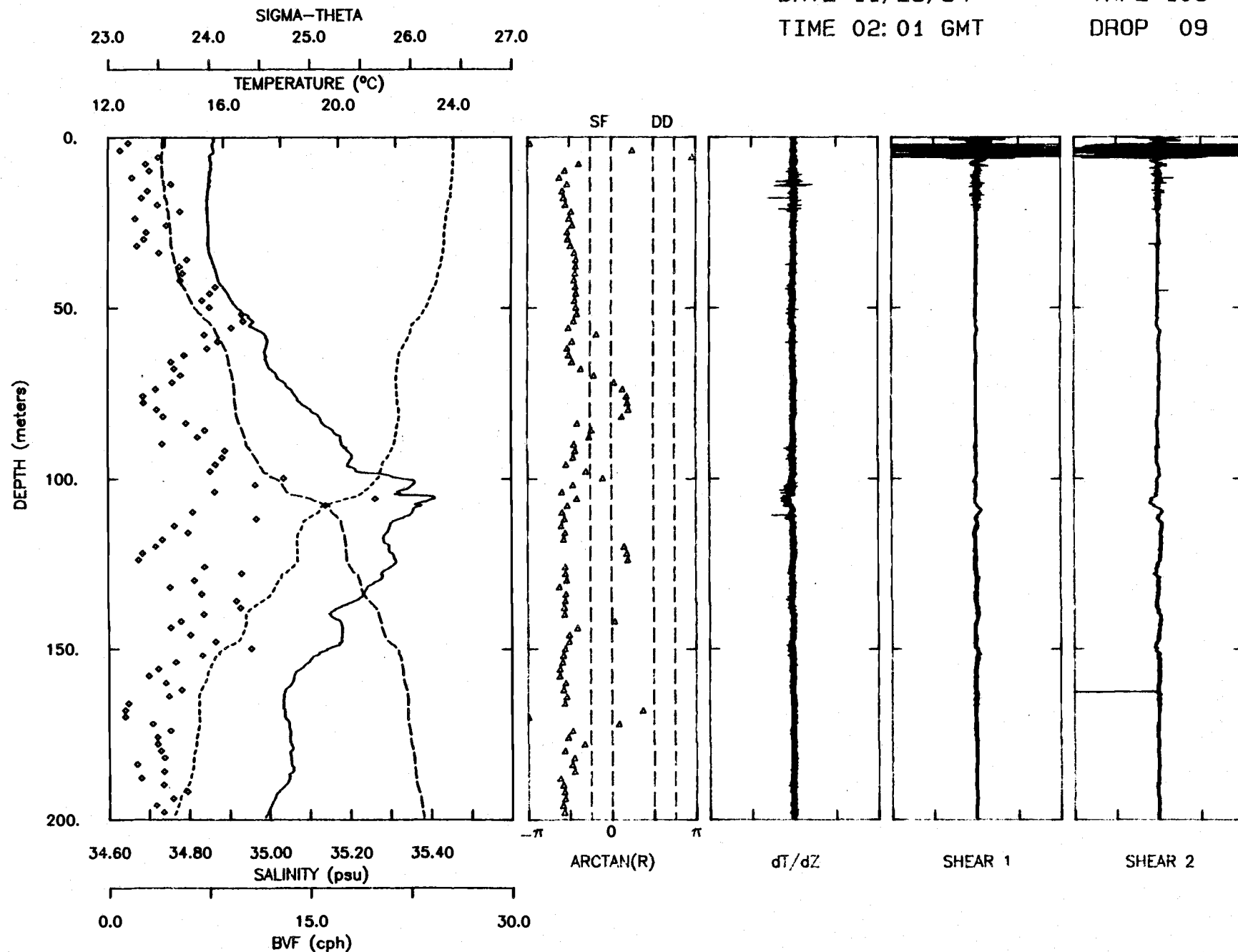
DATE 11/23/84
TIME 01:02 GMT

TAPE 106
DROP 05



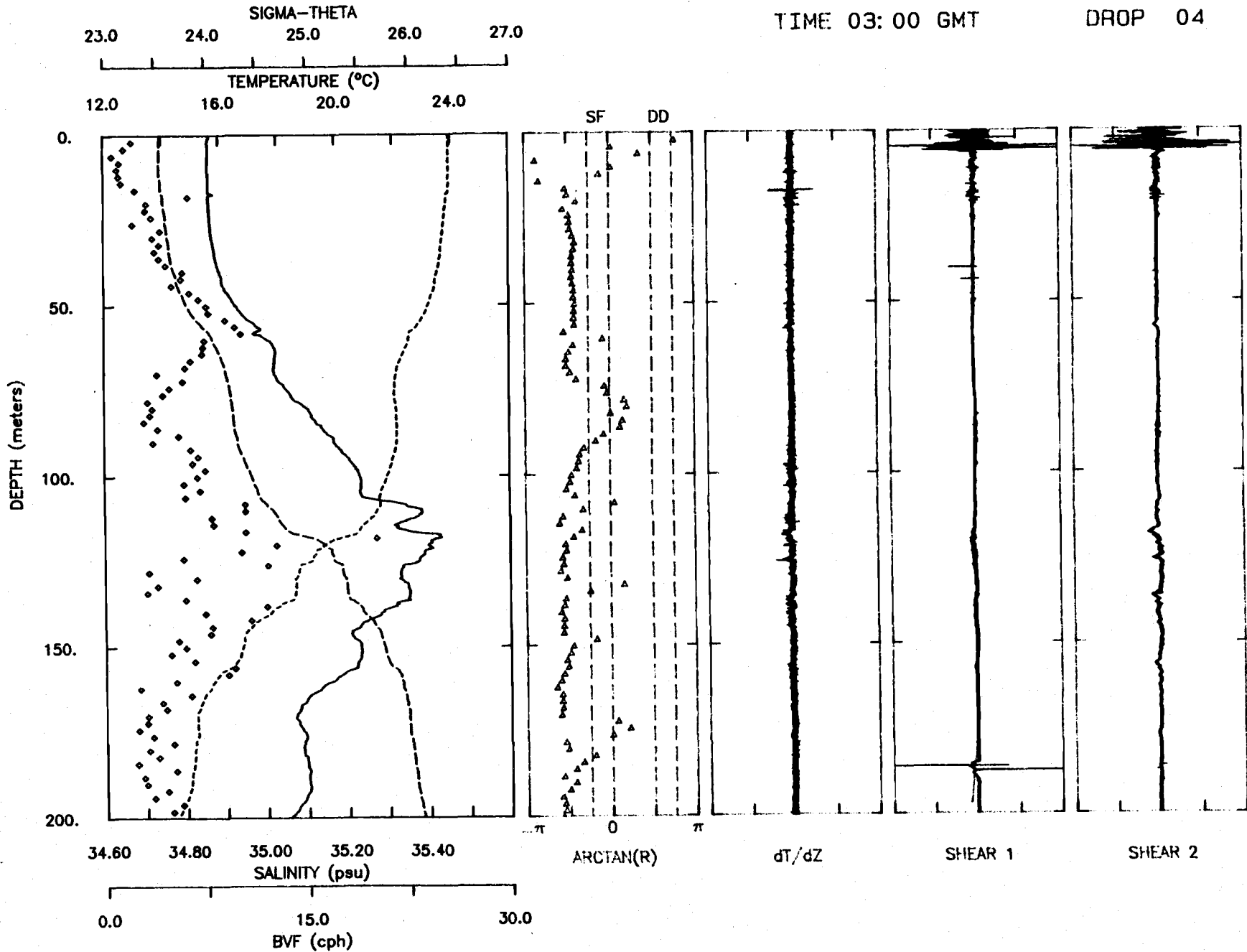
DATE 11/23/84
TIME 02:01 GMT

TAPE 106
DROP 09



DATE 11/23/84
TIME 03:00 GMT

TAPE 107
DROP 04

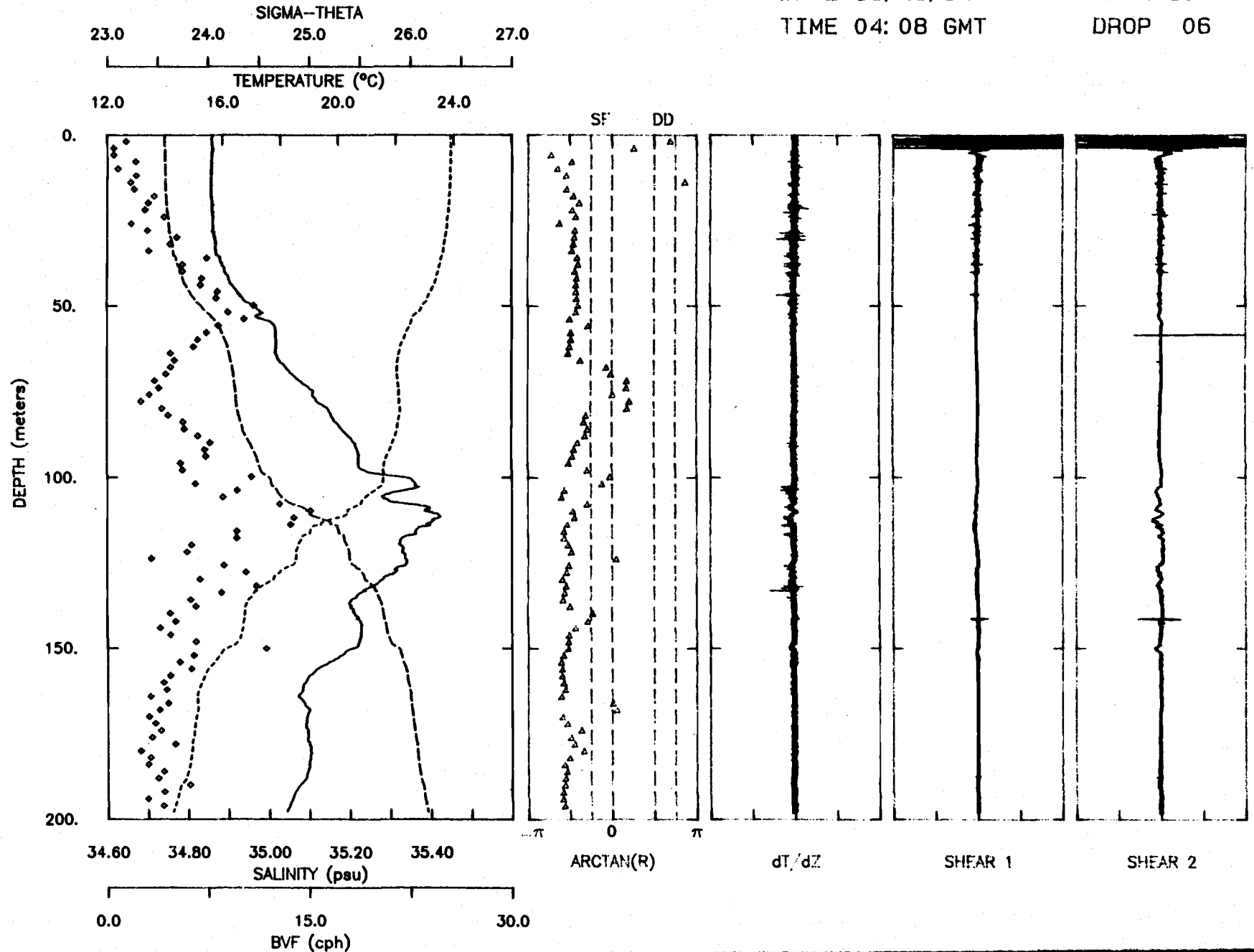


DATE 11/23/84

TAPE 107

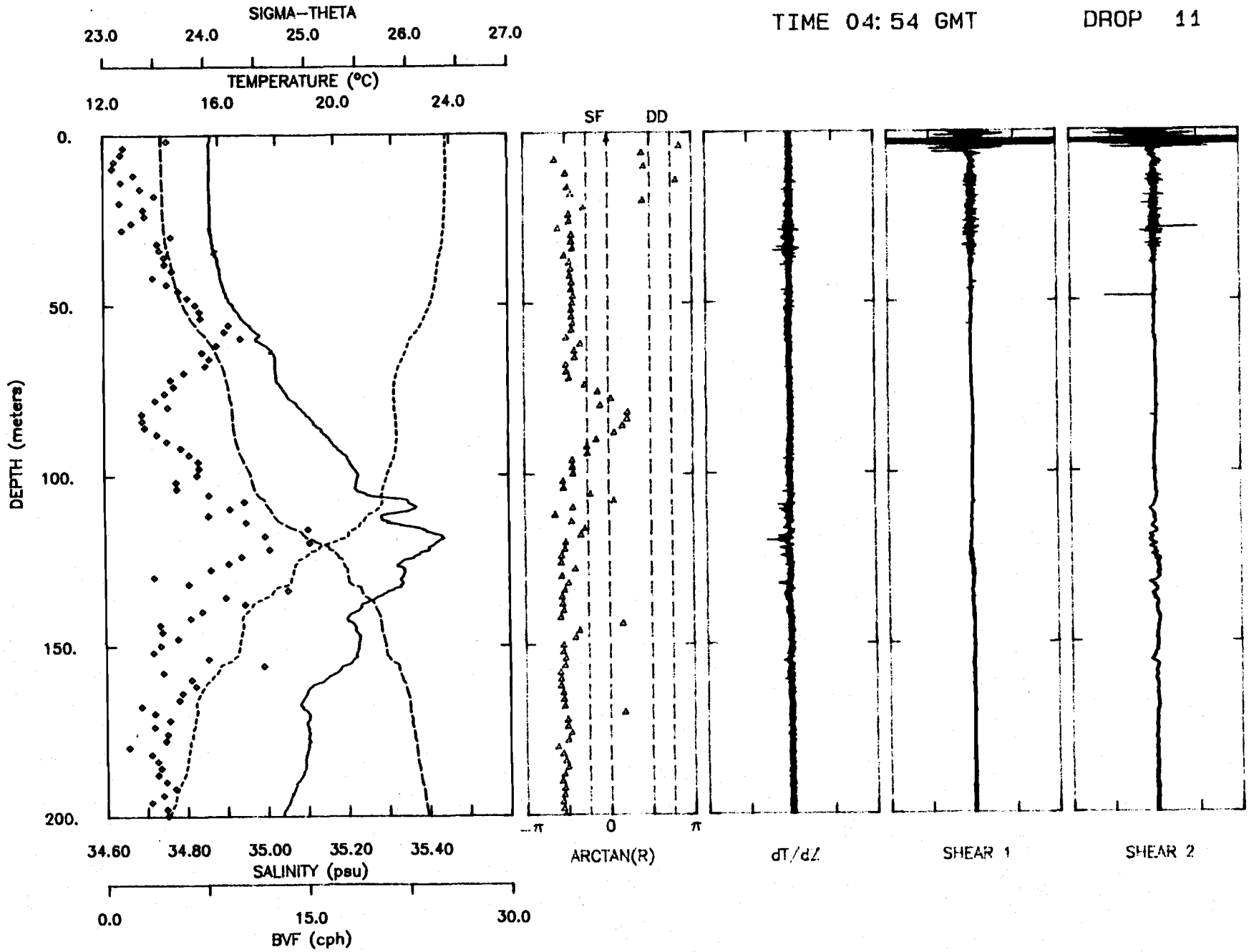
TIME 04:08 GMT

DROP 06



DATE 11/23/84
TIME 04:54 GMT

TAPE 107
DROP 11

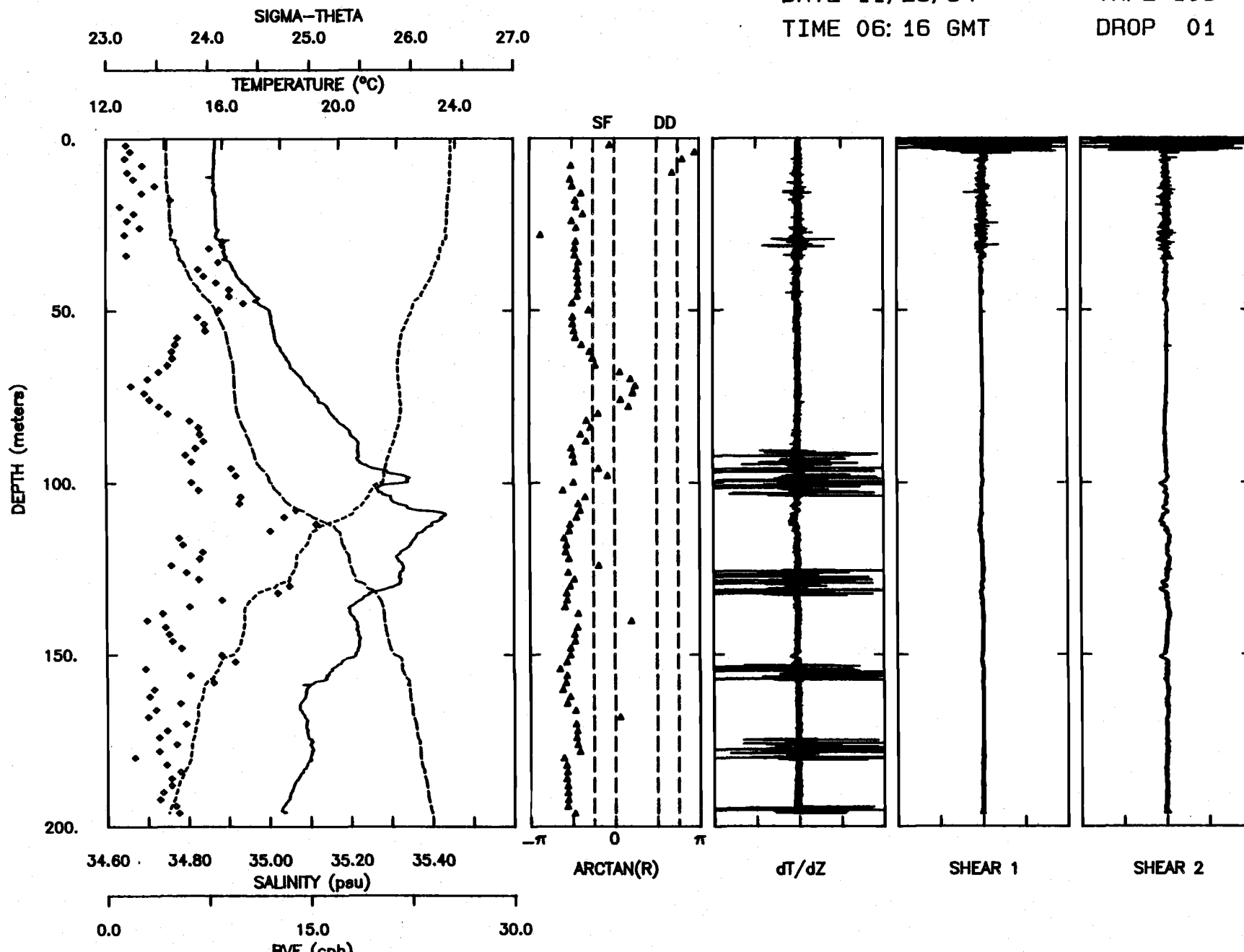


DATE 11/23/84

TAPE 108

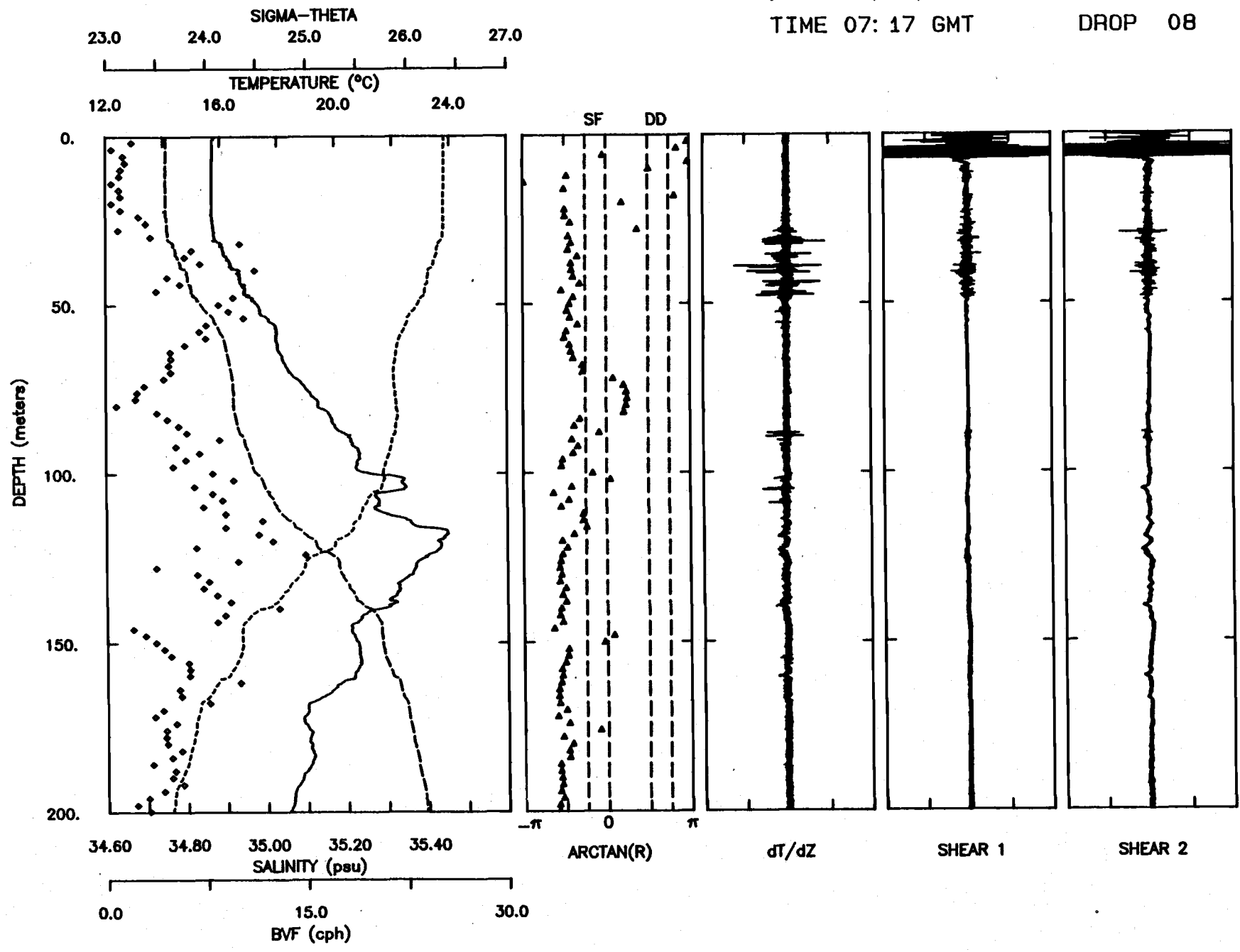
TIME 06:16 GMT

DROP 01



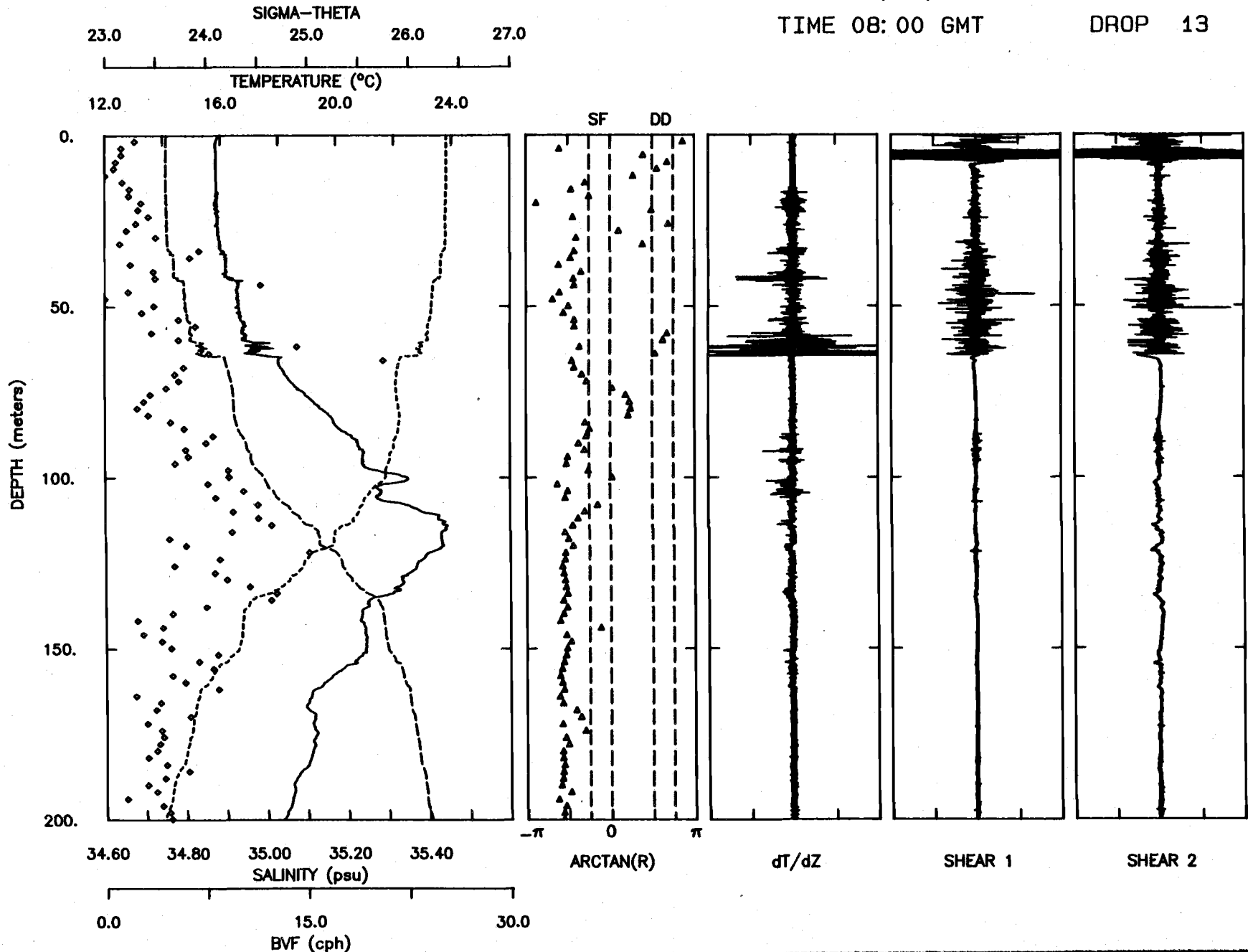
DATE 11/23/84
TIME 07:17 GMT

TAPE 108
DROP 08



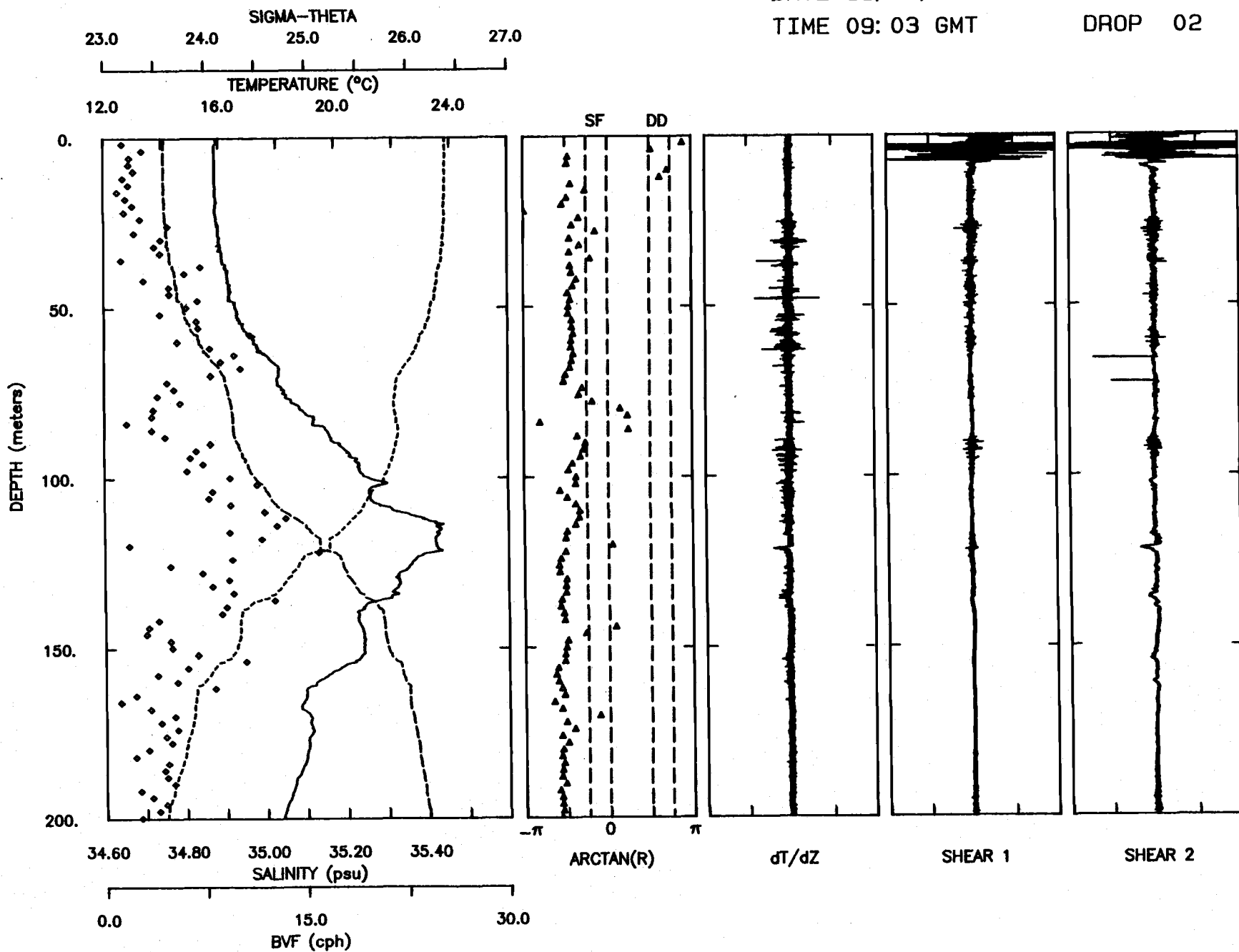
DATE 11/23/84
TIME 08:00 GMT

TAPE 108
DROP 13



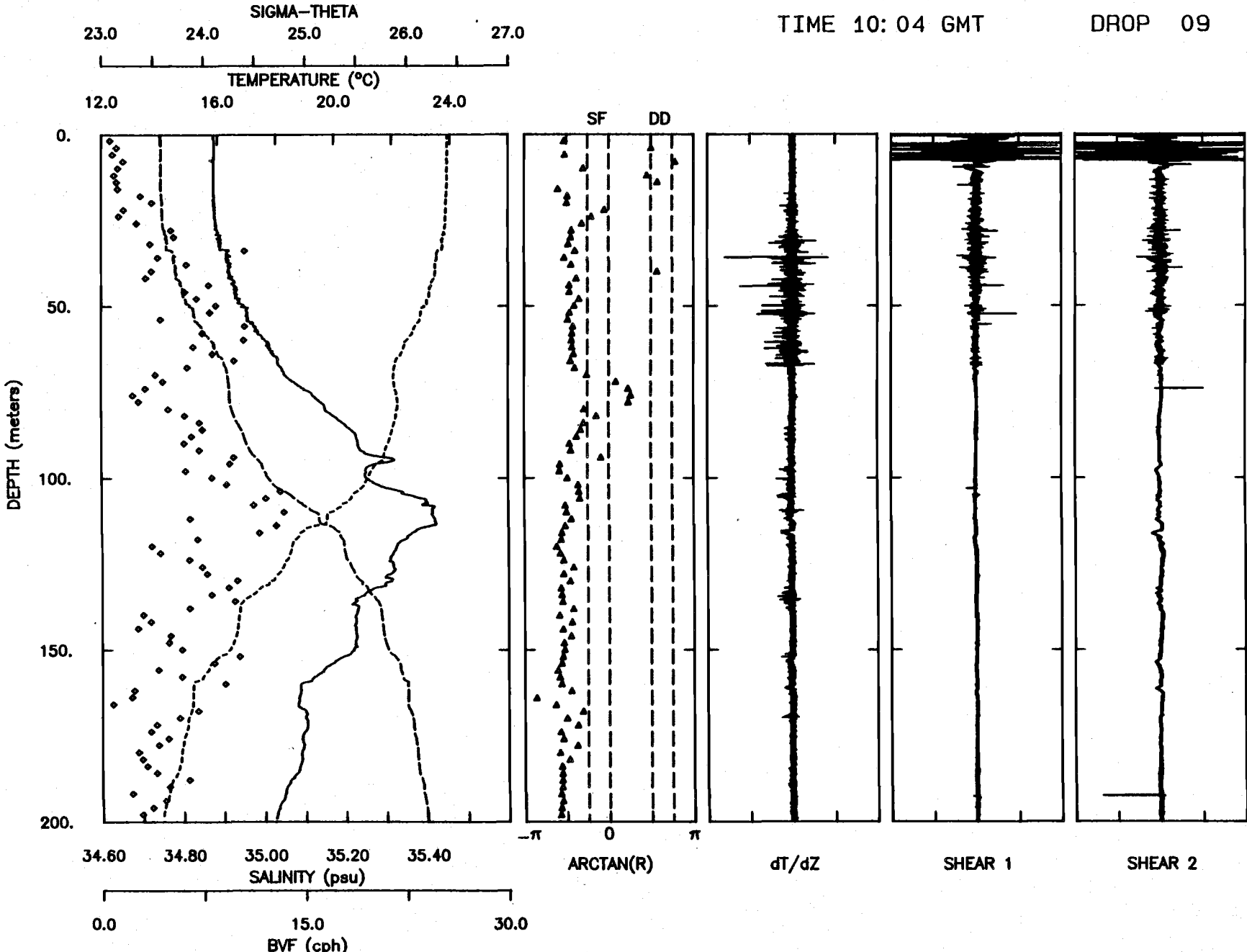
DATE 11/23/84
TIME 09:03 GMT

TAPE 109
DROP 02



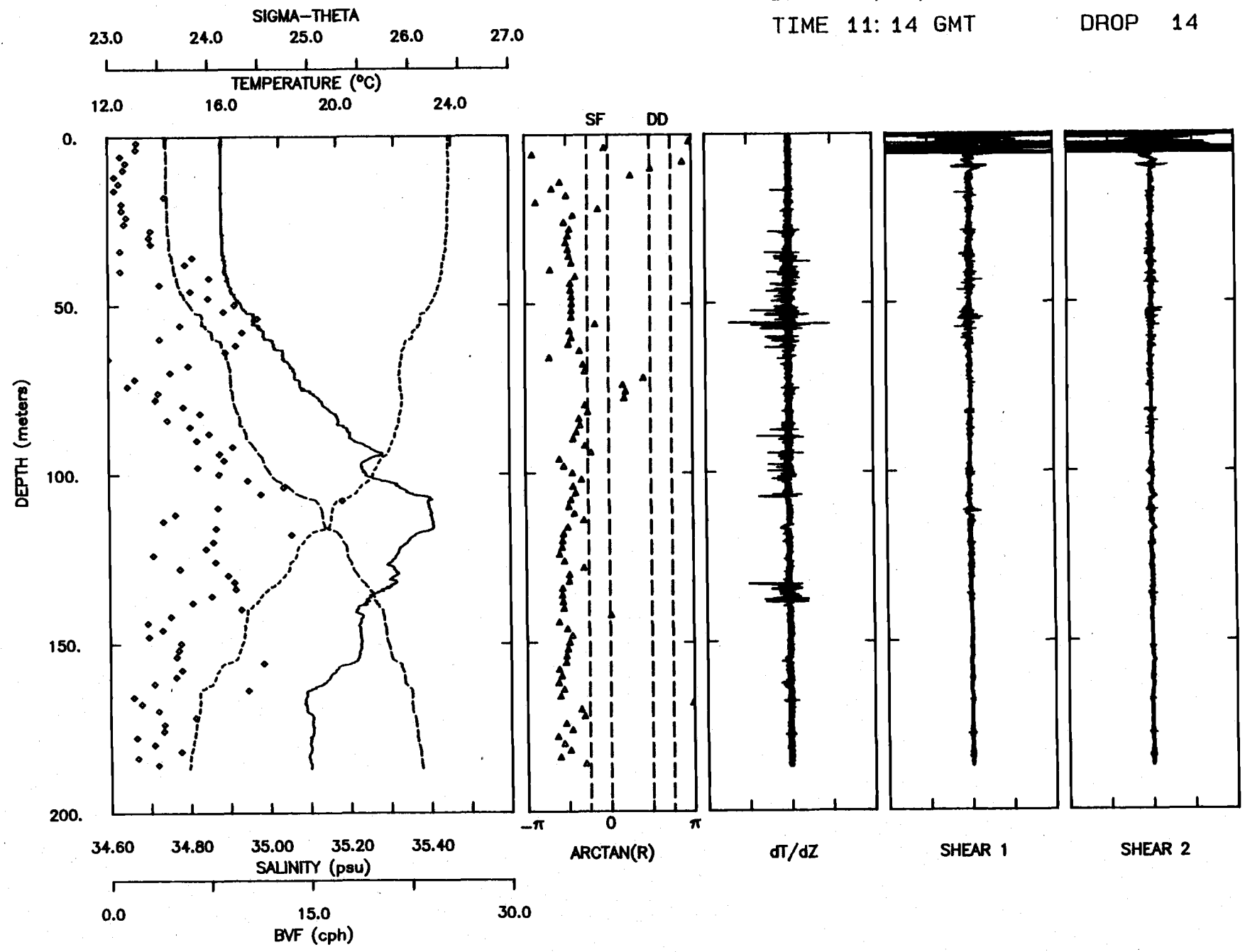
DATE 11/23/84
TIME 10:04 GMT

TAPE 109
DROP 09



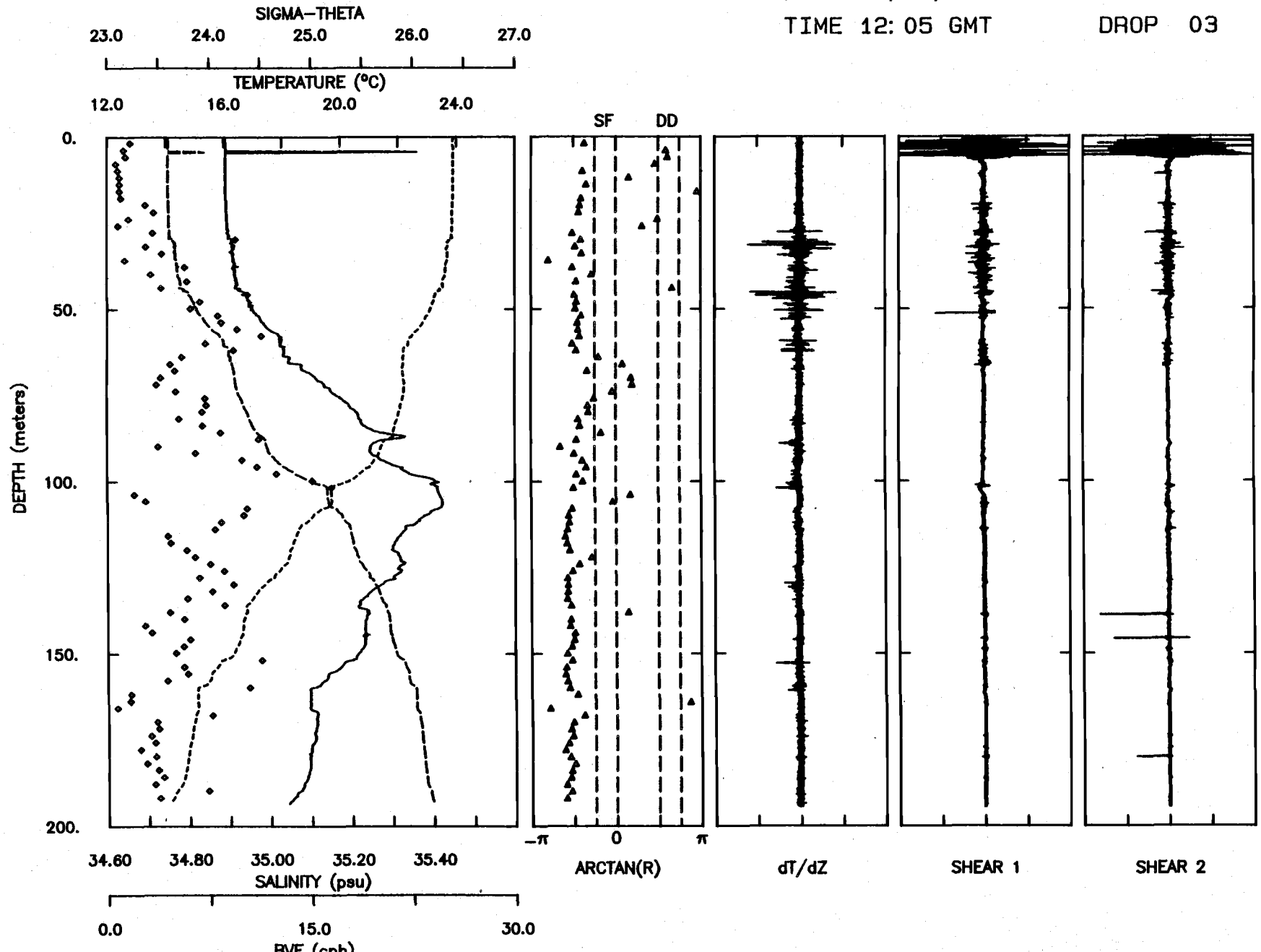
DATE 11/23/84
TIME 11:14 GMT

TAPE 109
DROP 14



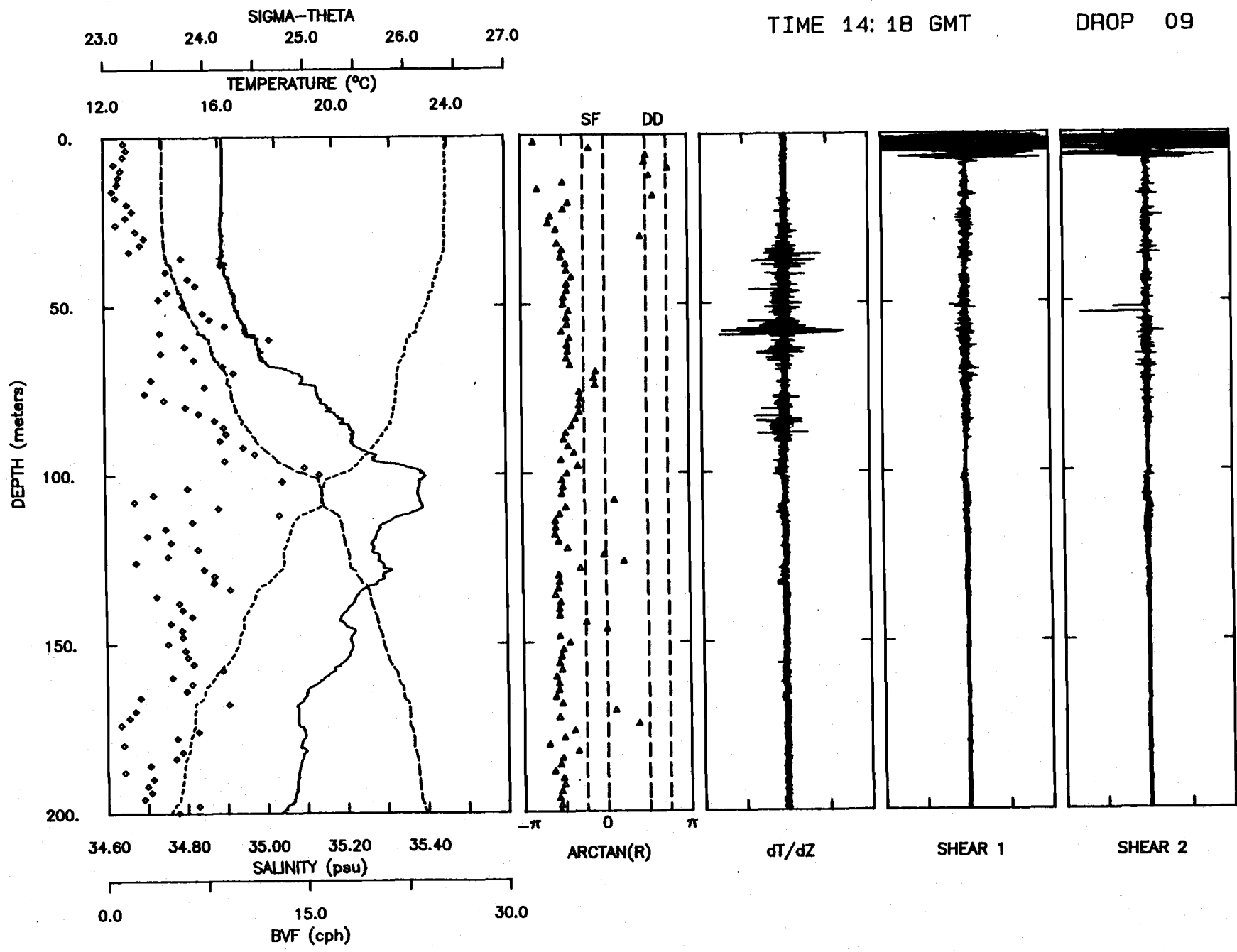
DATE 11/23/84
TIME 12:05 GMT

TAPE 110
DROP 03



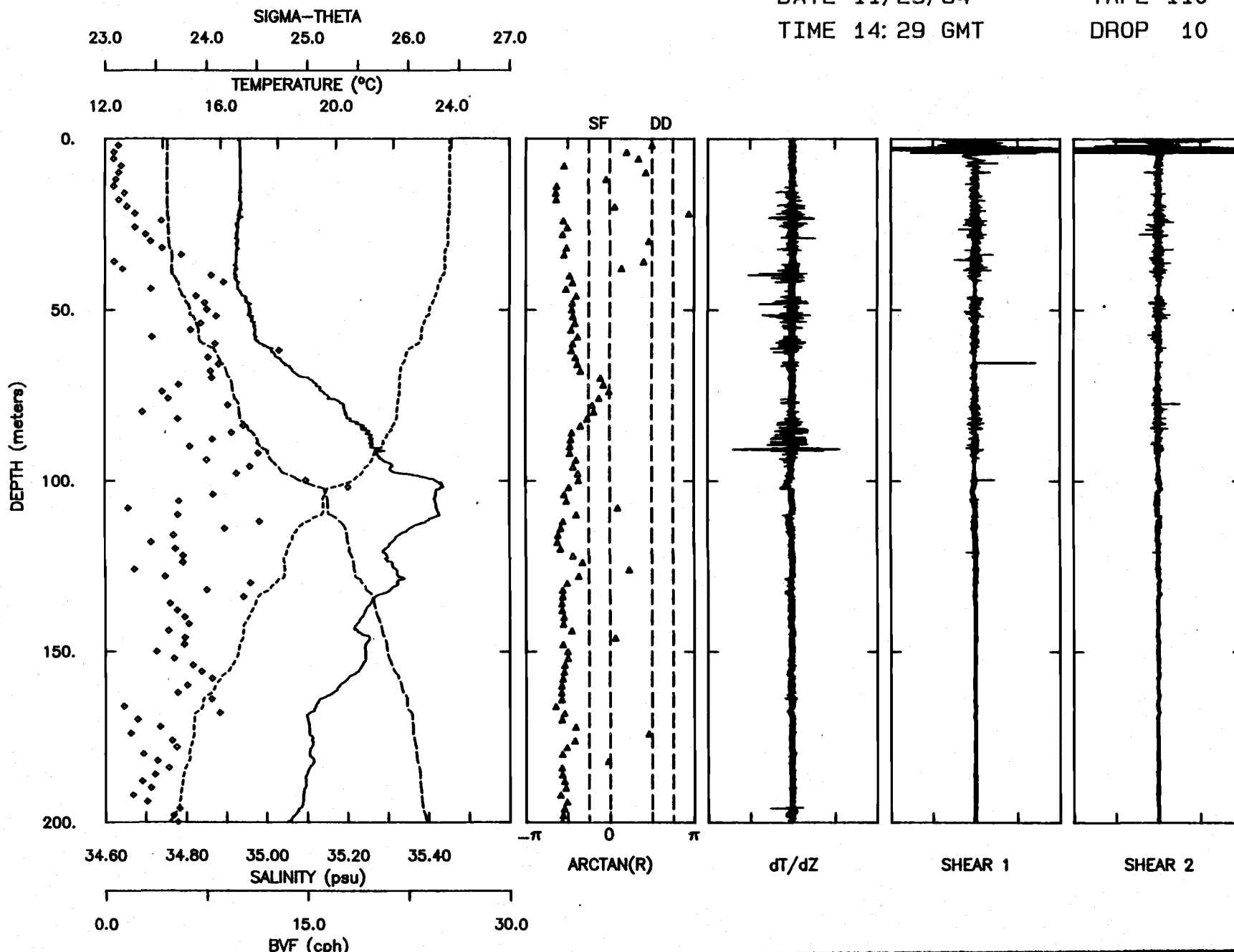
DATE 11/23/84
TIME 14:18 GMT

TAPE 110
DROP 09



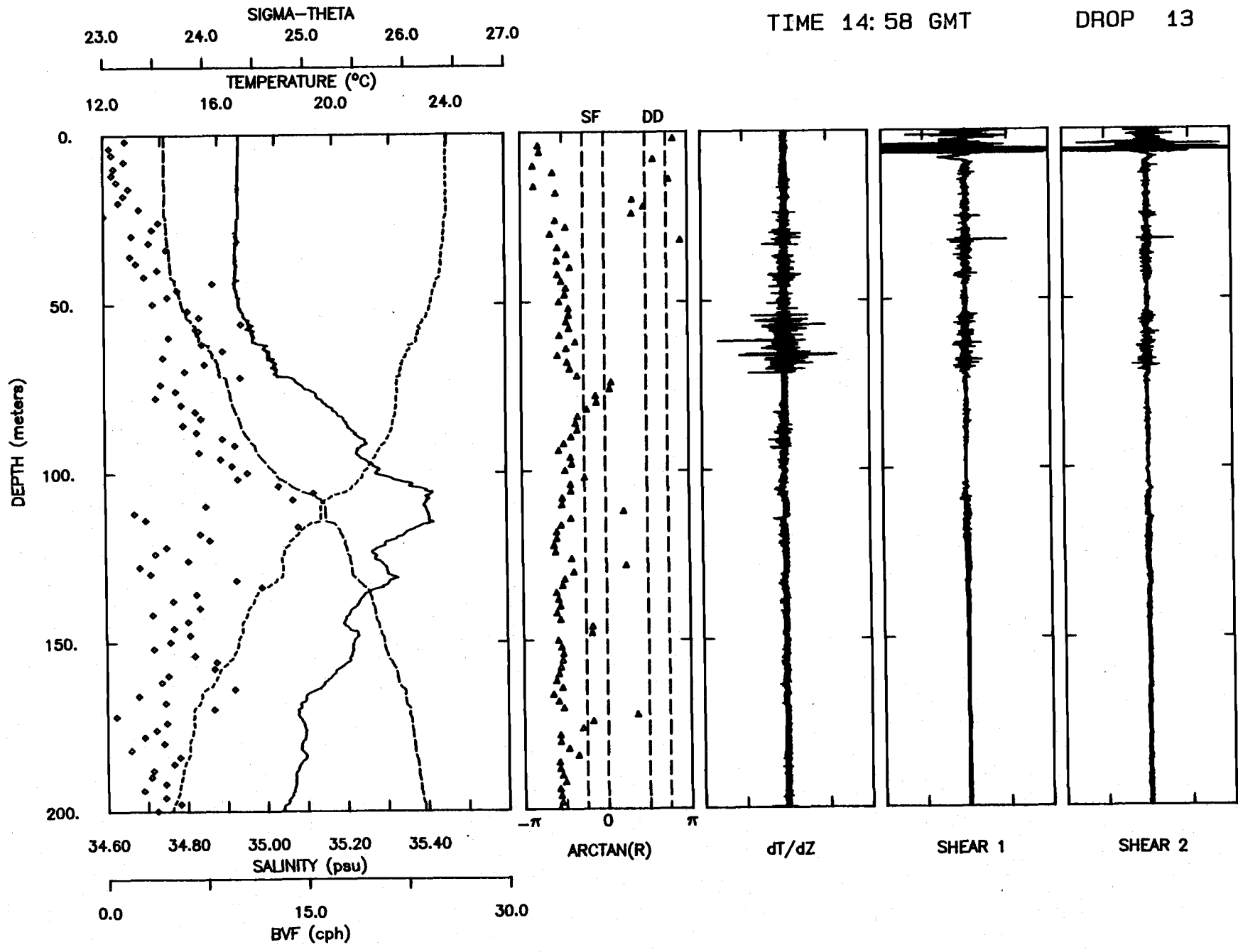
DATE 11/23/84
TIME 14: 29 GMT

TAPE 110
DROP 10



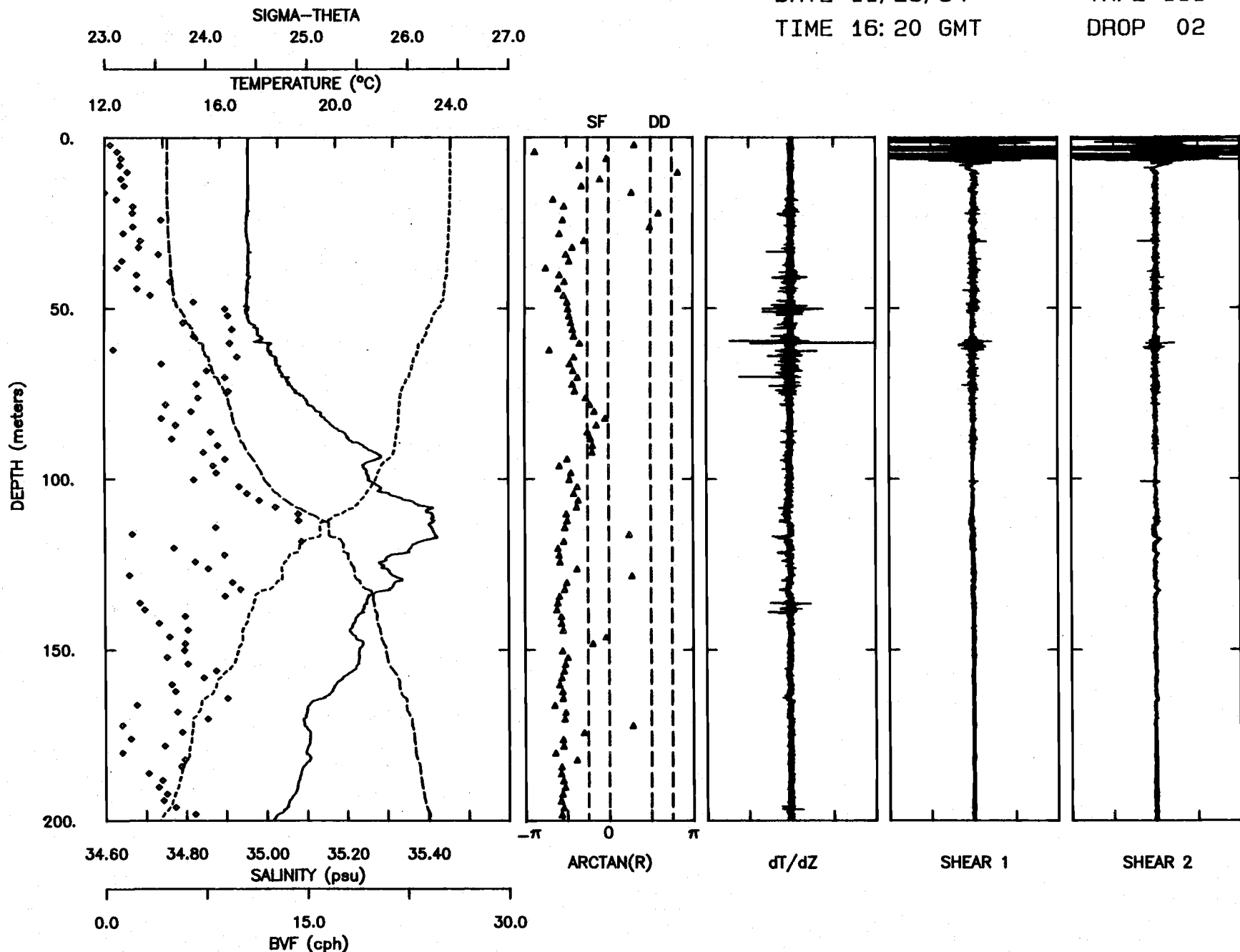
DATE 11/23/84
TIME 14:58 GMT

TAPE 110
DROP 13



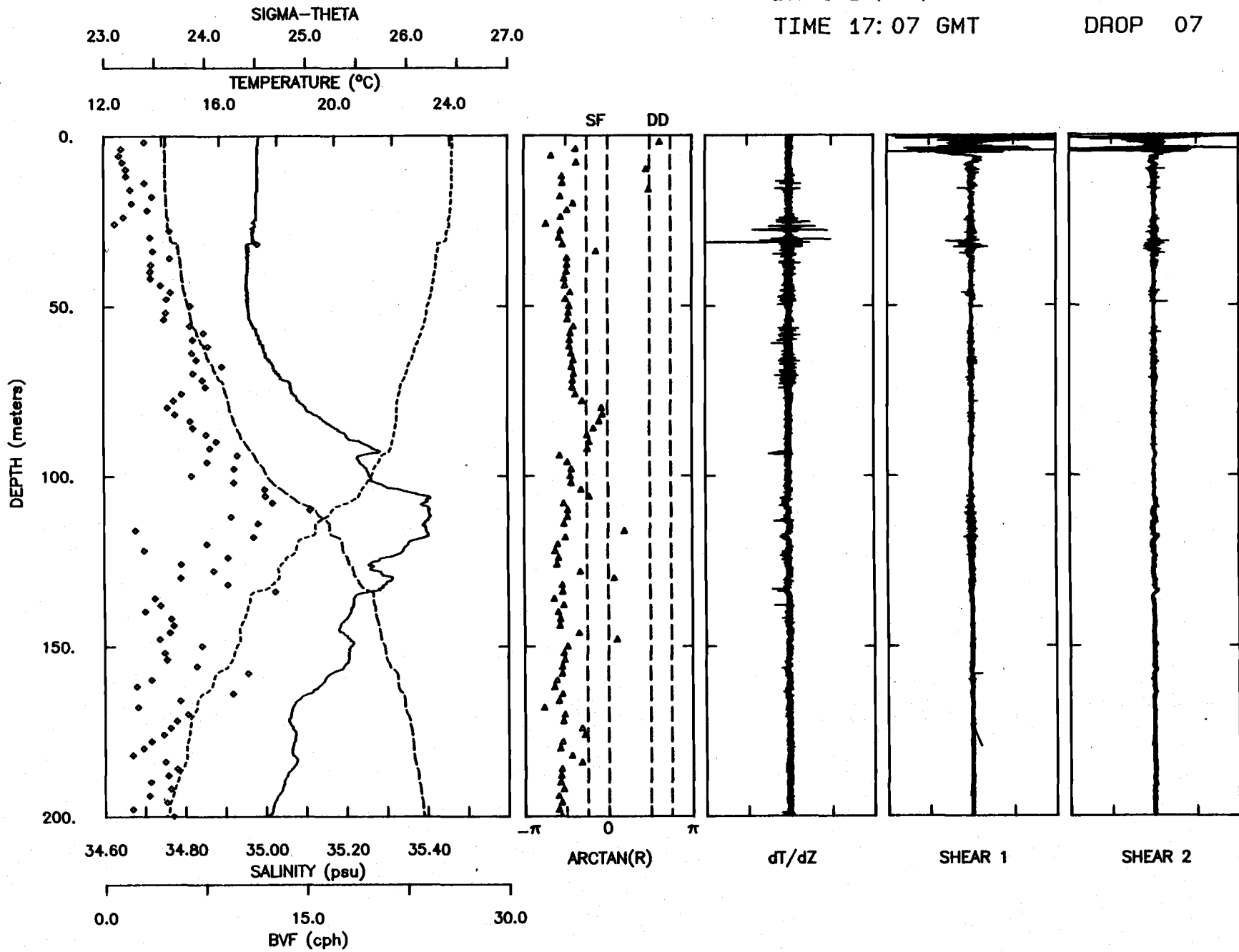
DATE 11/23/84
TIME 16:20 GMT

TAPE 111
DROP 02



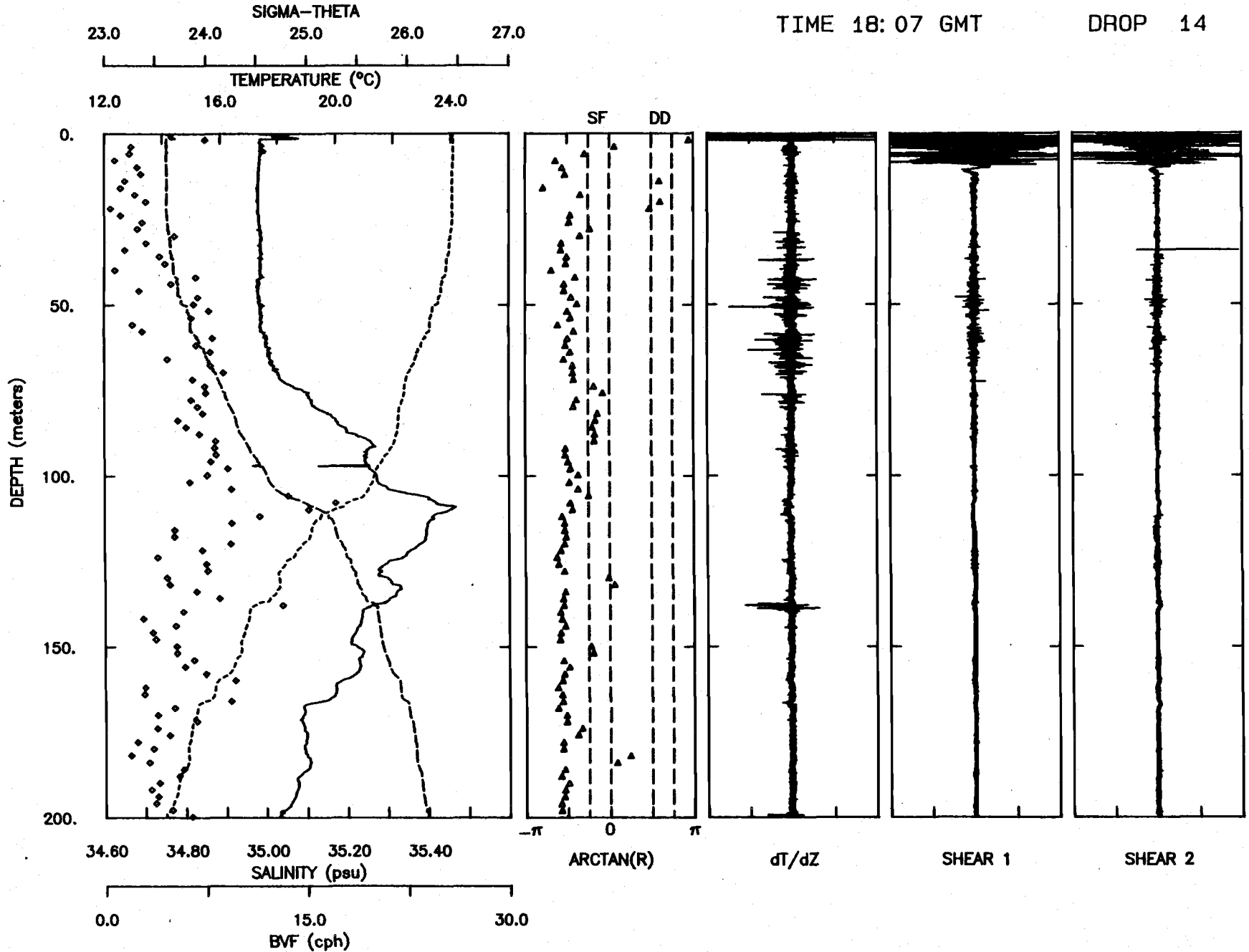
DATE 11/23/84
TIME 17:07 GMT

TAPE 111
DROP 07



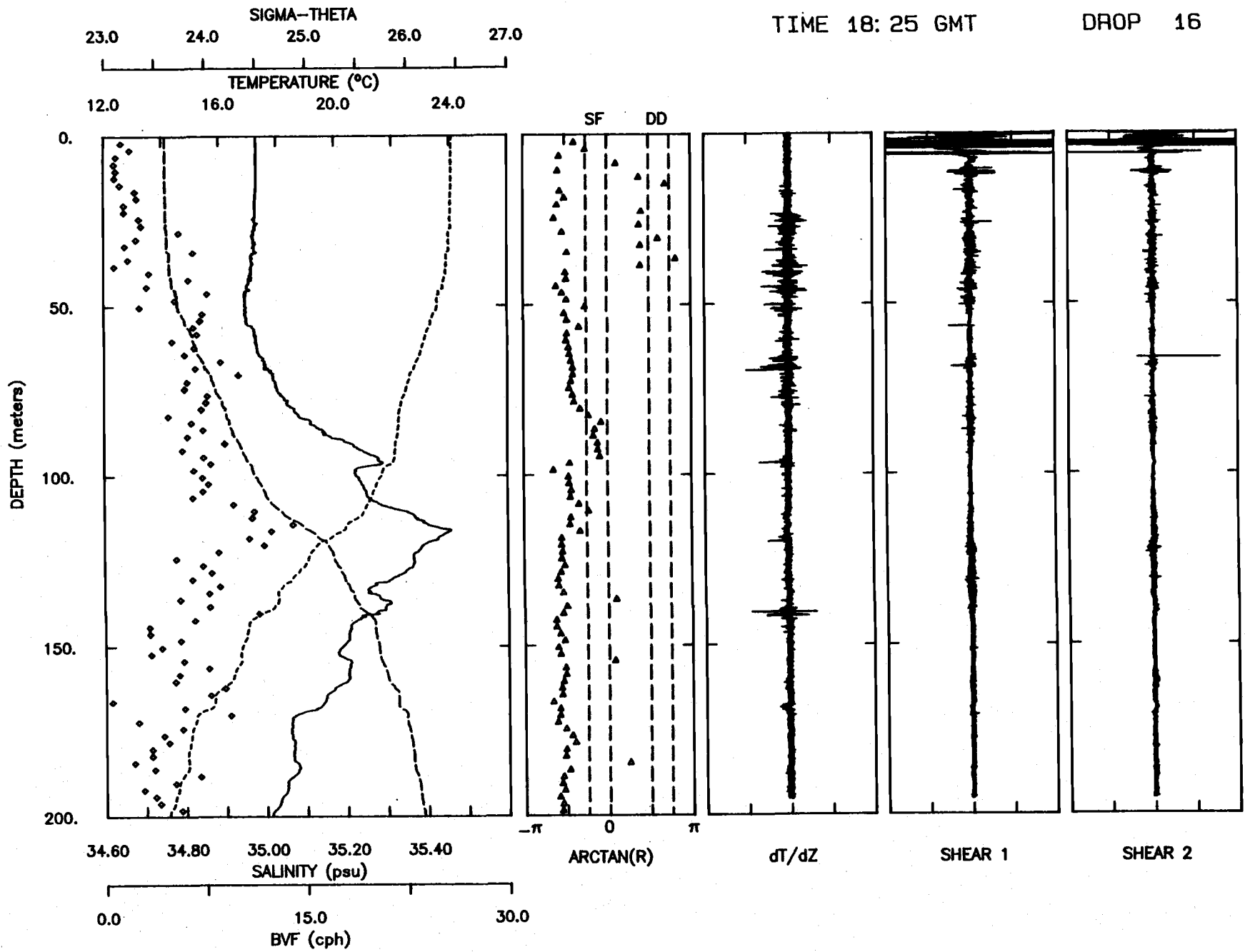
DATE 11/23/84
TIME 18:07 GMT

TAPE 111
DROP 14



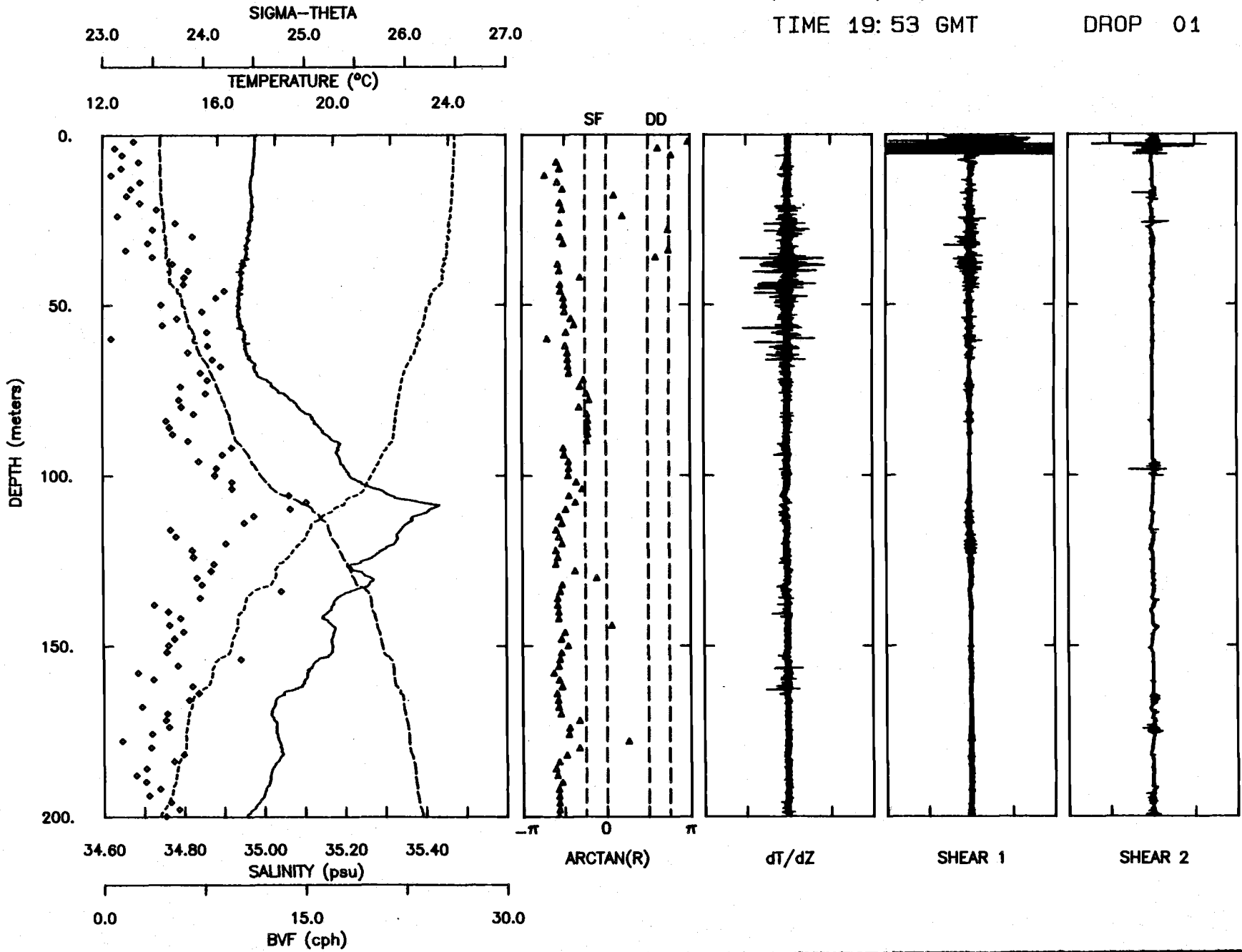
DATE 11/23/84
TIME 18:25 GMT

TAPE 111
DROP 16



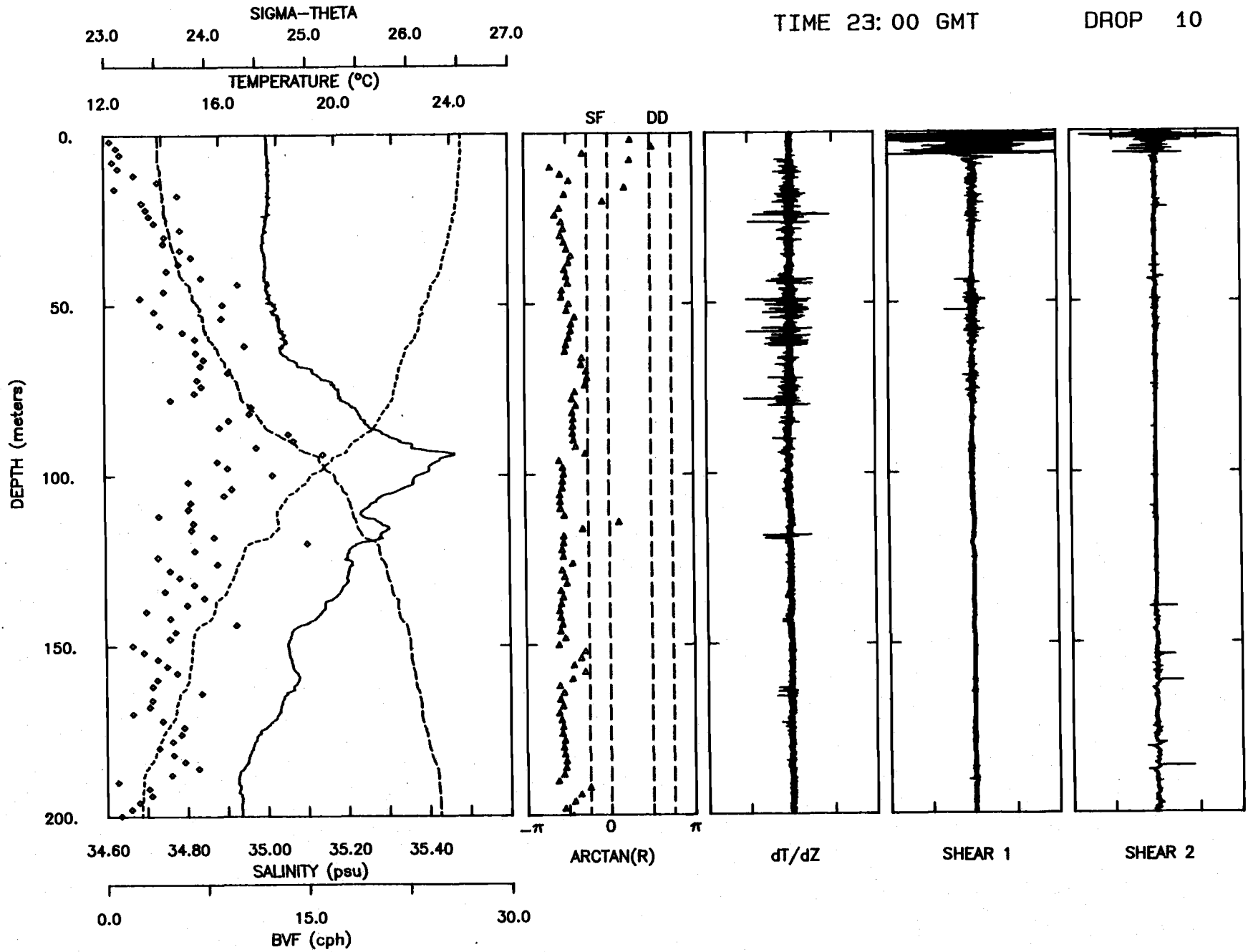
DATE 11/23/84
TIME 19:53 GMT

TAPE 112
DROP 01



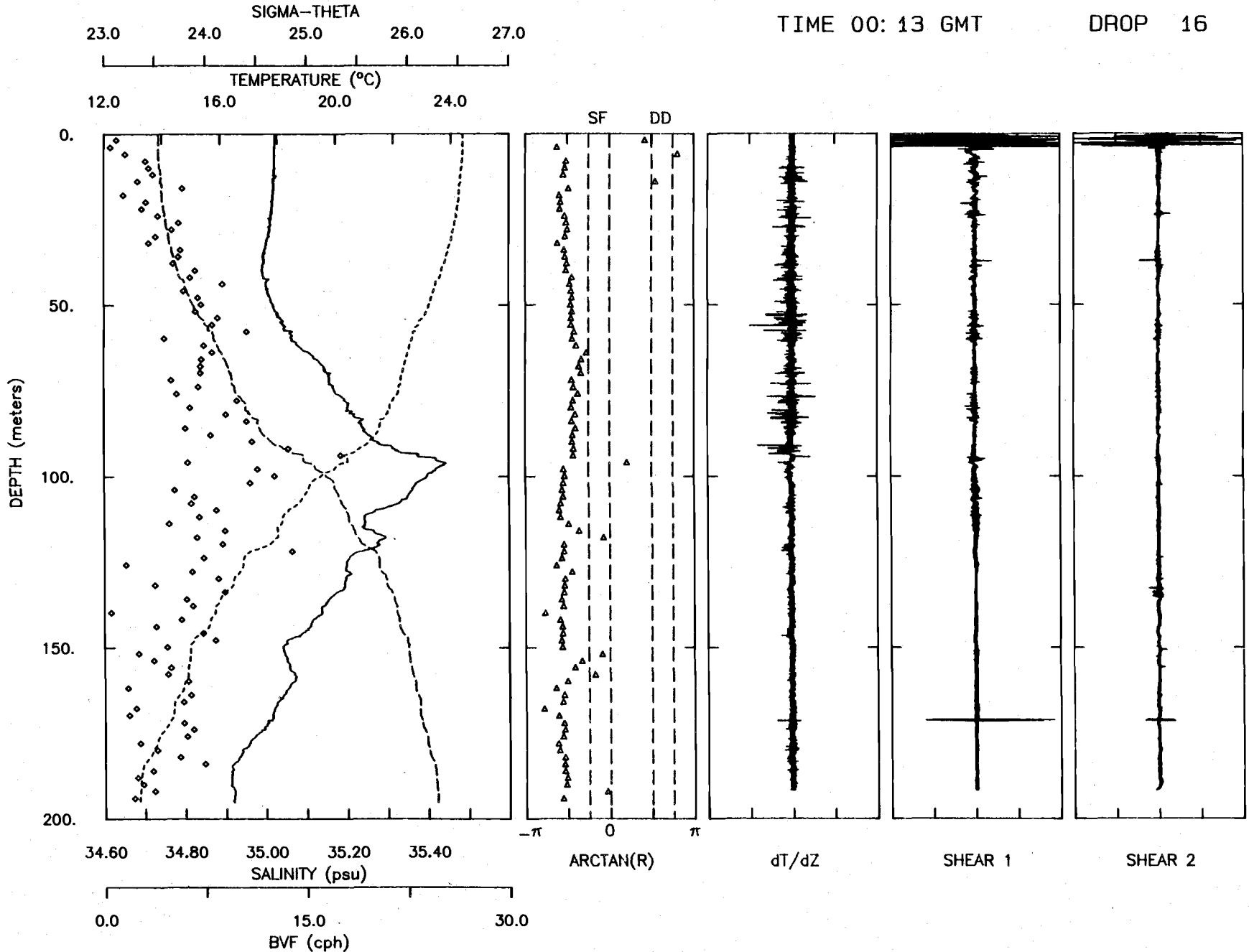
DATE 11/23/84
TIME 23:00 GMT

TAPE 113
DROP 10



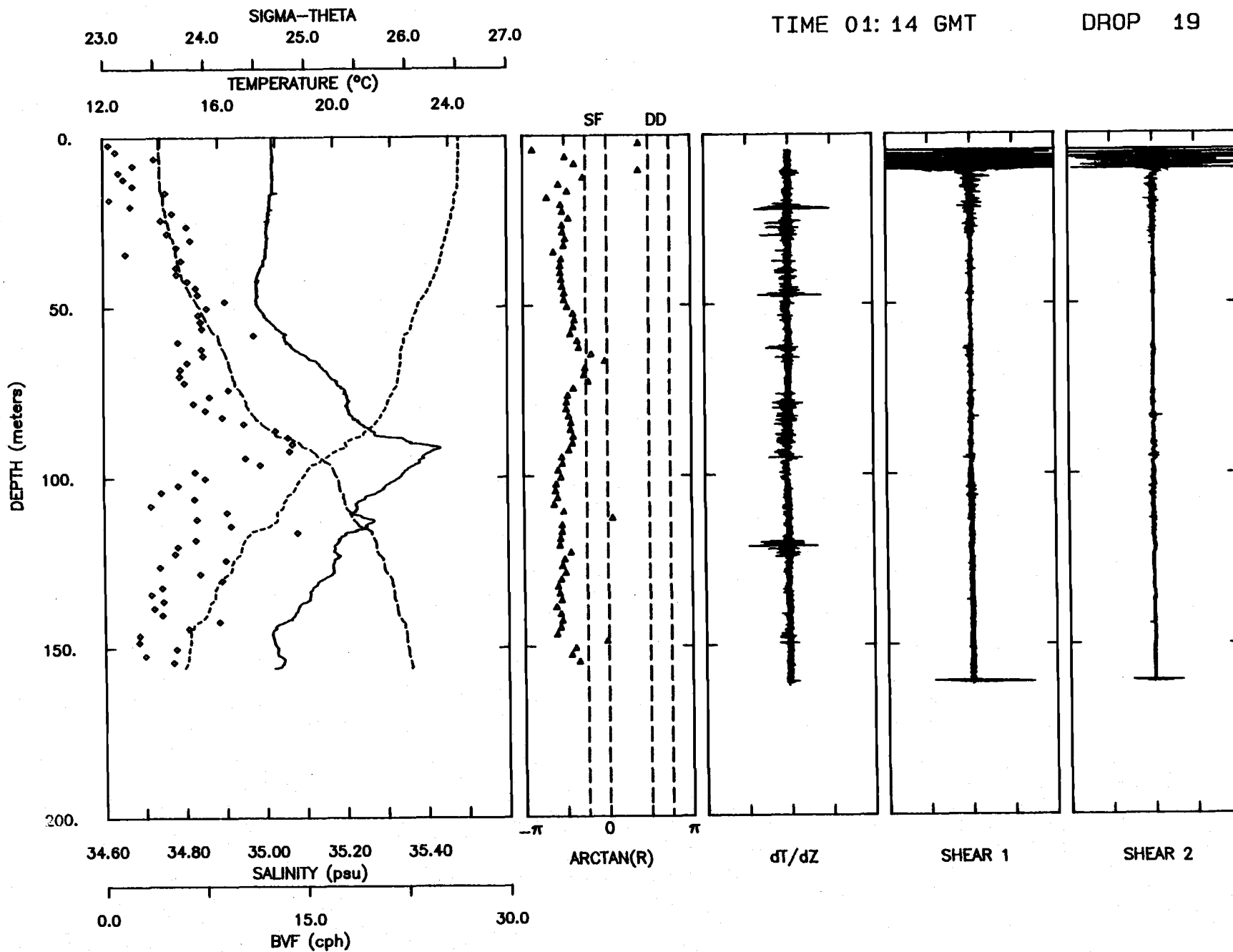
DATE 11/24/84
TIME 00:13 GMT

TAPE 113
DROP 16



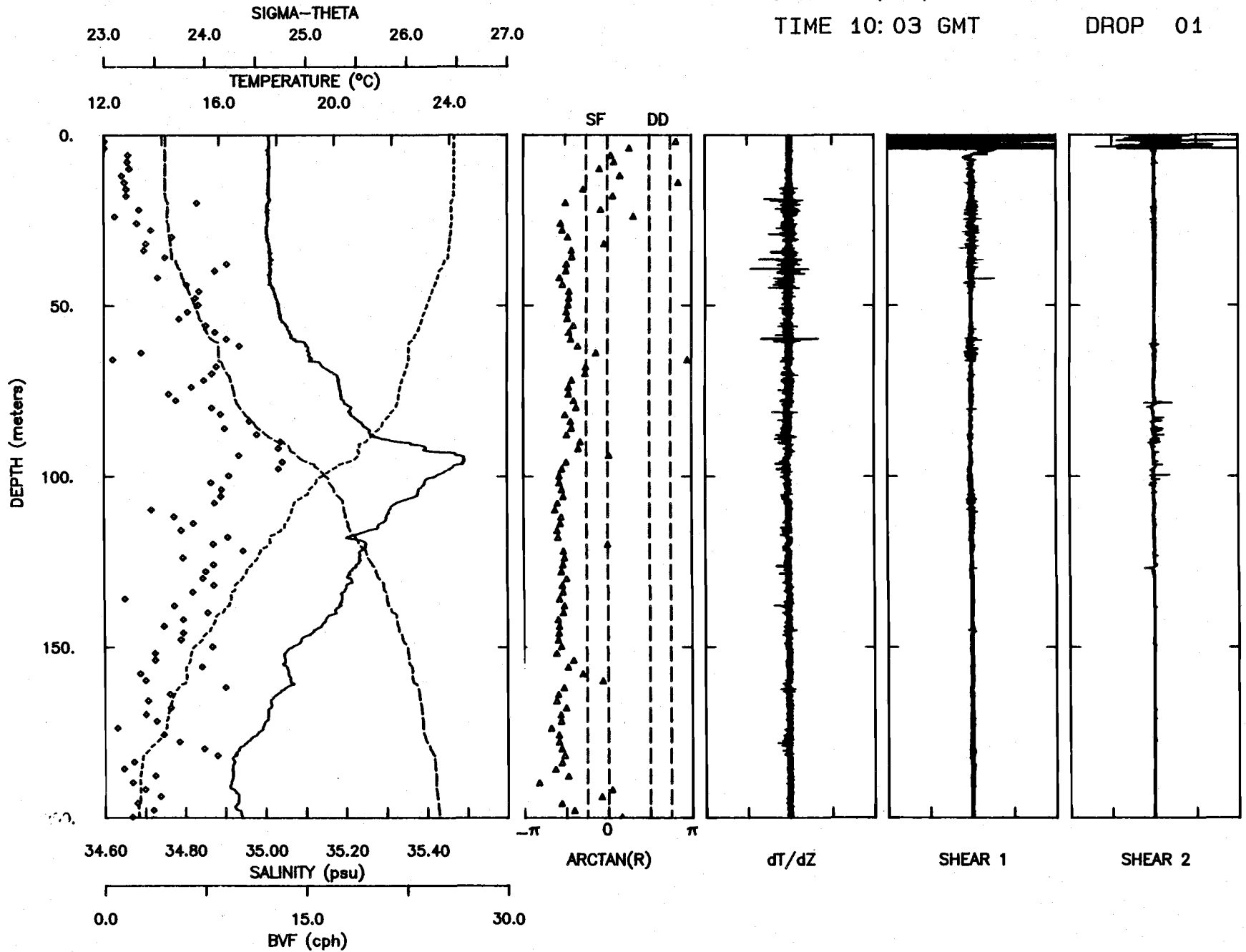
DATE 11/24/84
TIME 01:14 GMT

TAPE 113
DROP 19



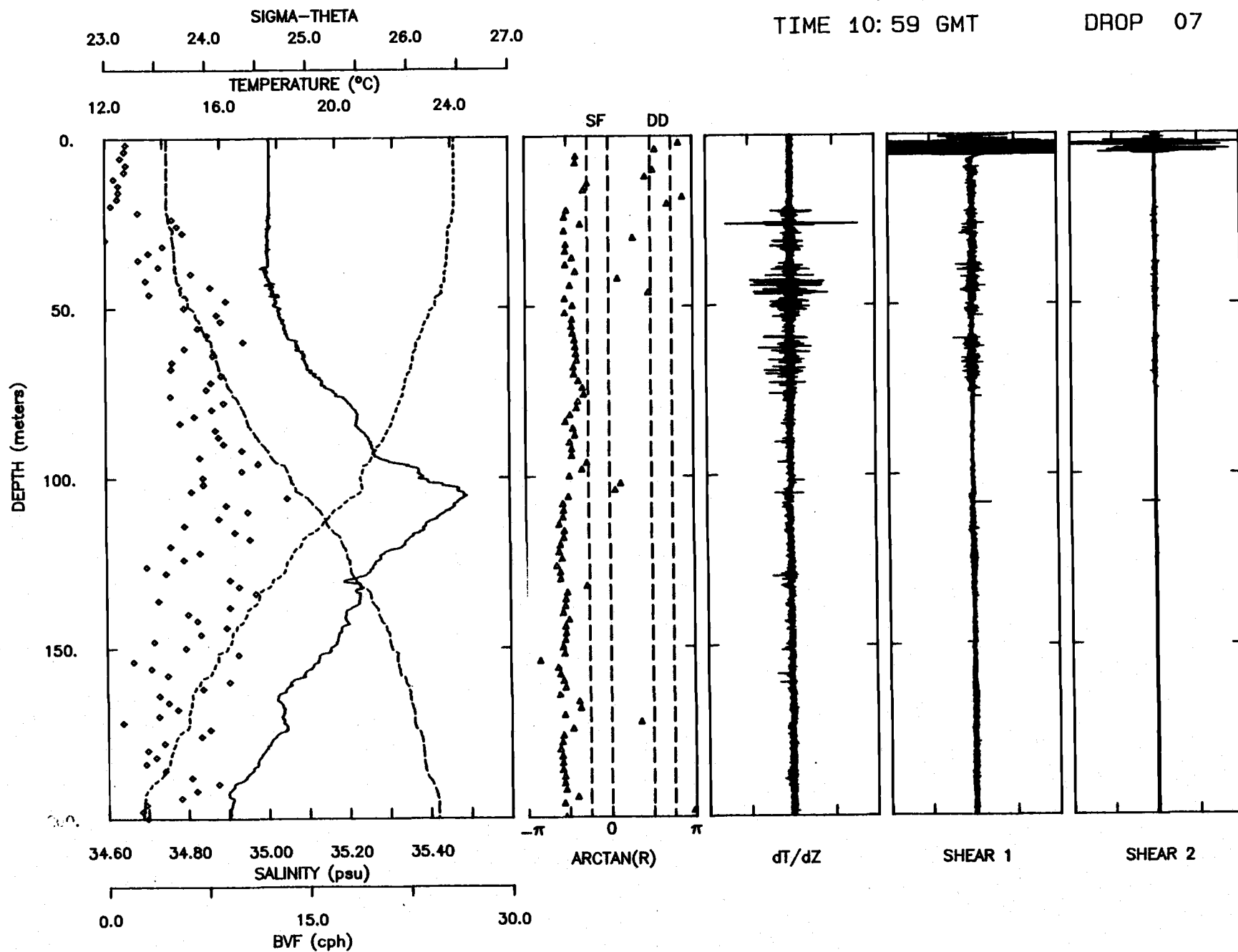
DATE 11/24/84
TIME 10:03 GMT

TAPE 115
DROP 01



DATE 11/24/84
TIME 10:59 GMT

TAPE 115
DROP 07

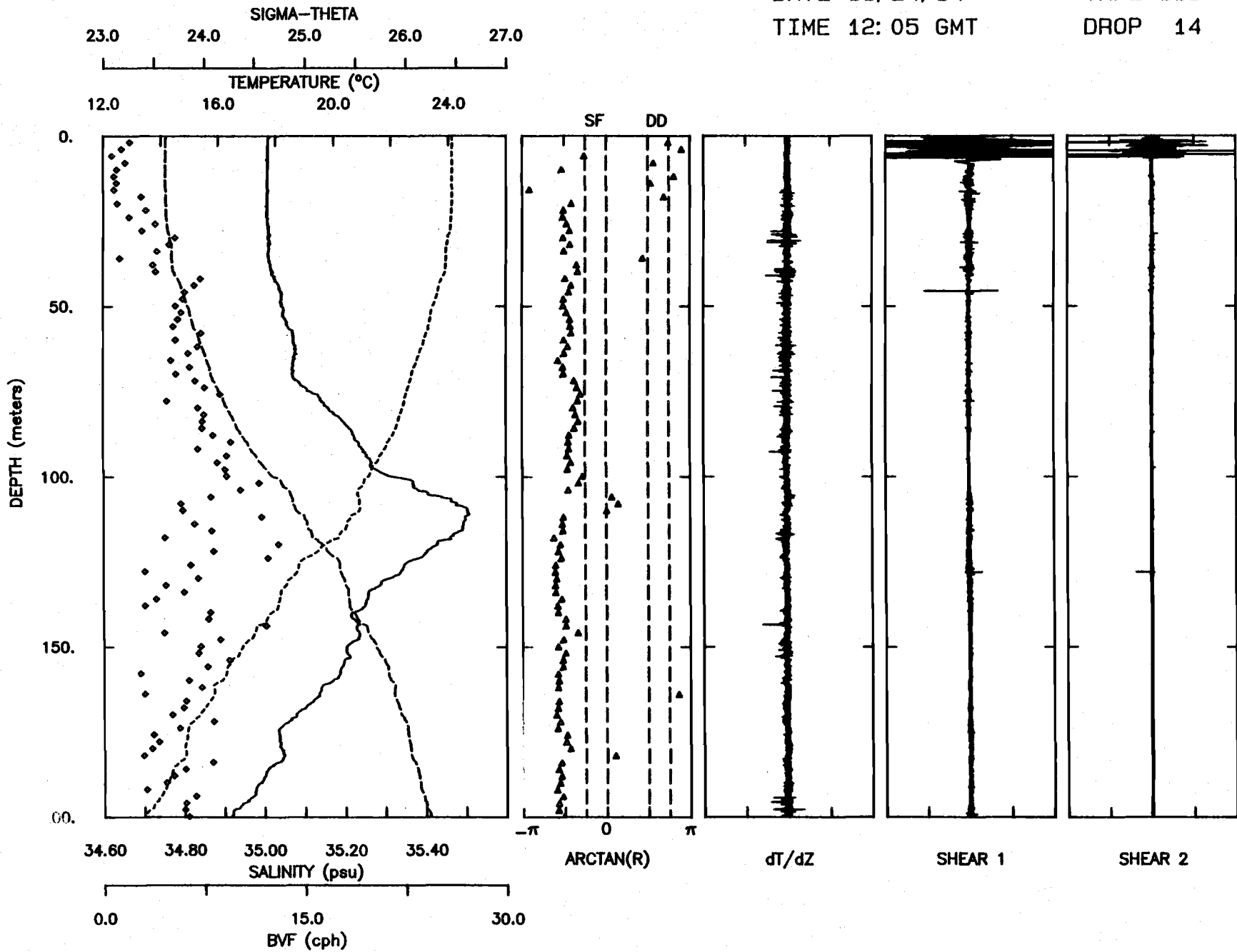


DATE 11/24/84

TAPE 115

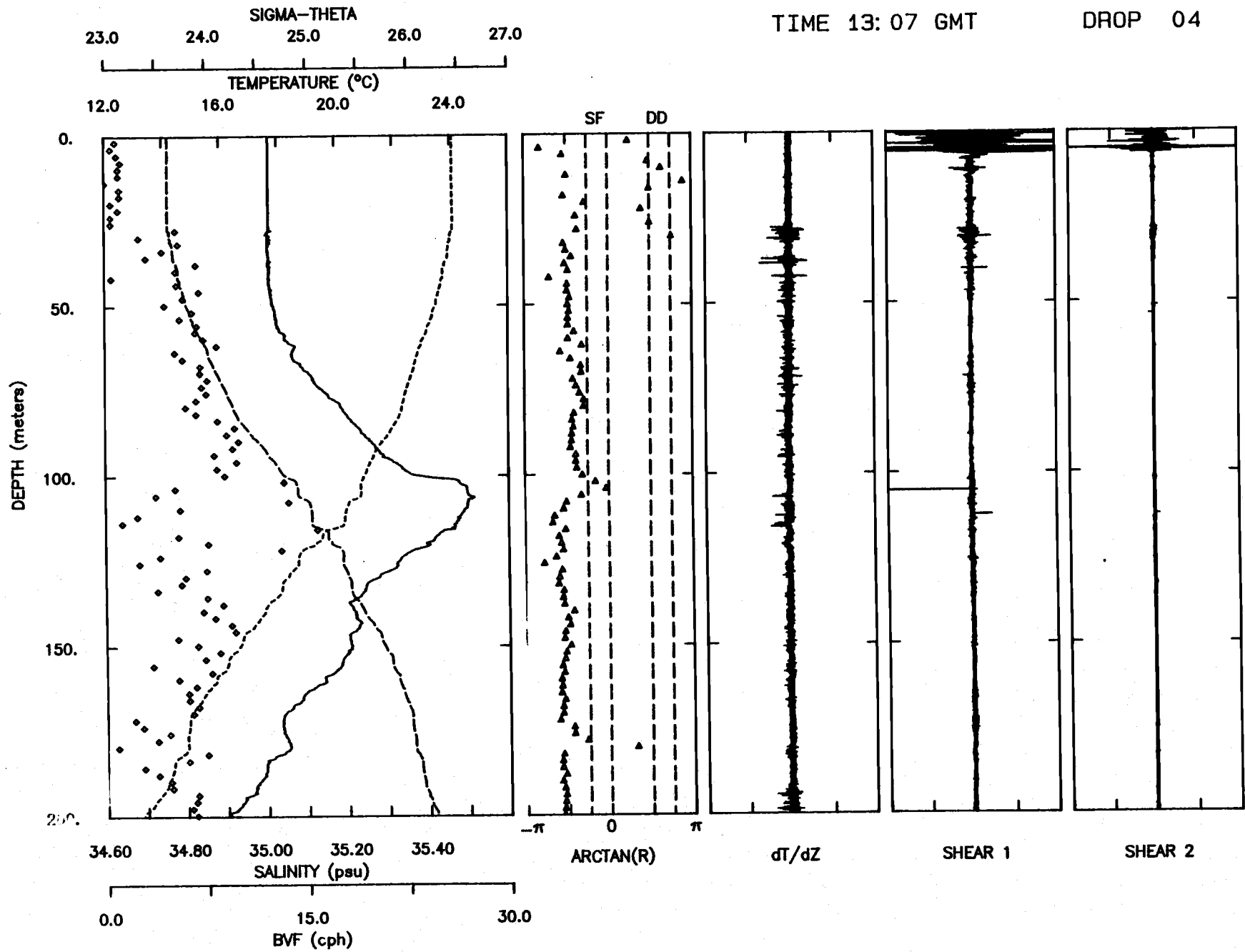
TIME 12:05 GMT

DROP 14



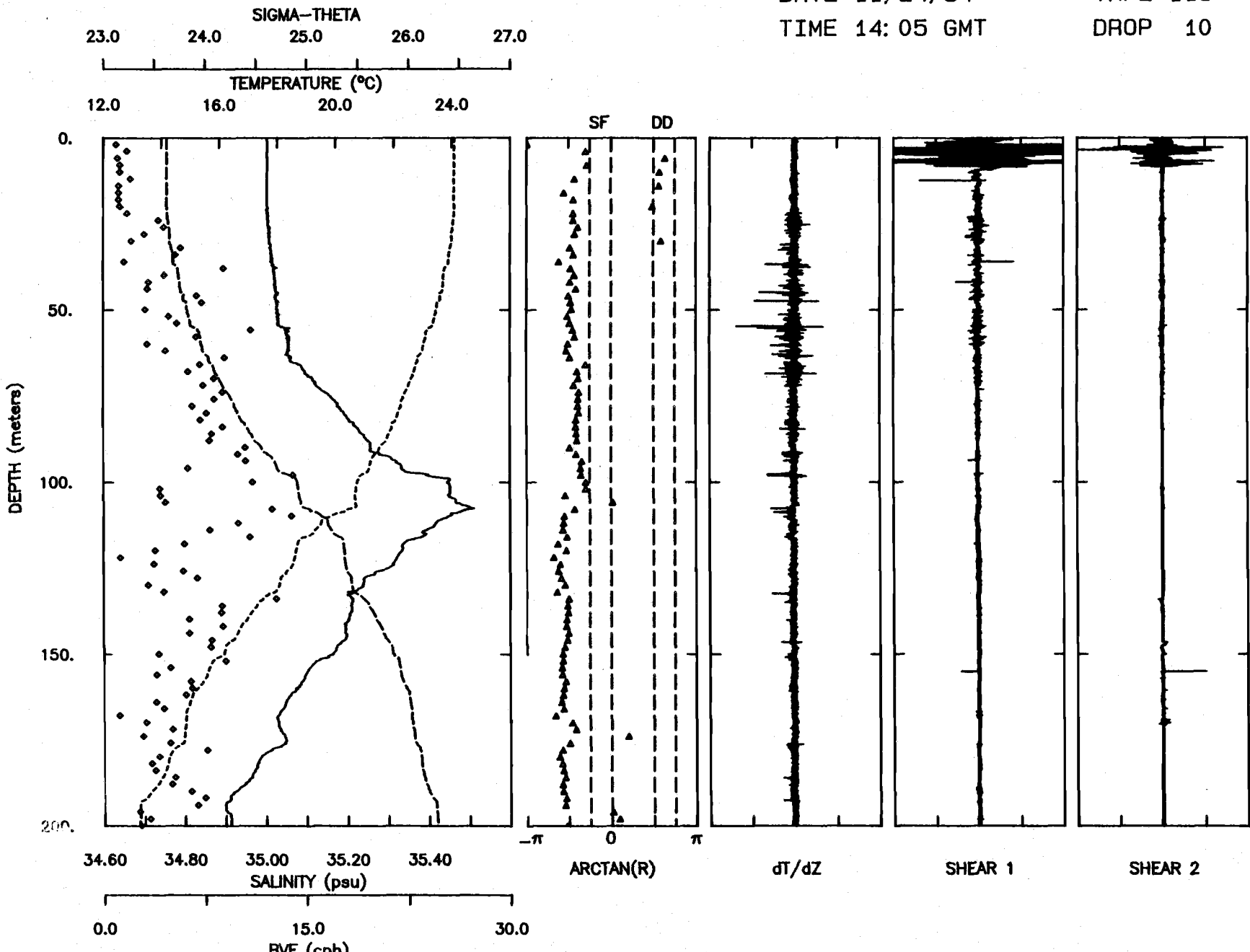
DATE 11/24/84
TIME 13:07 GMT

TAPE 116
DROP 04



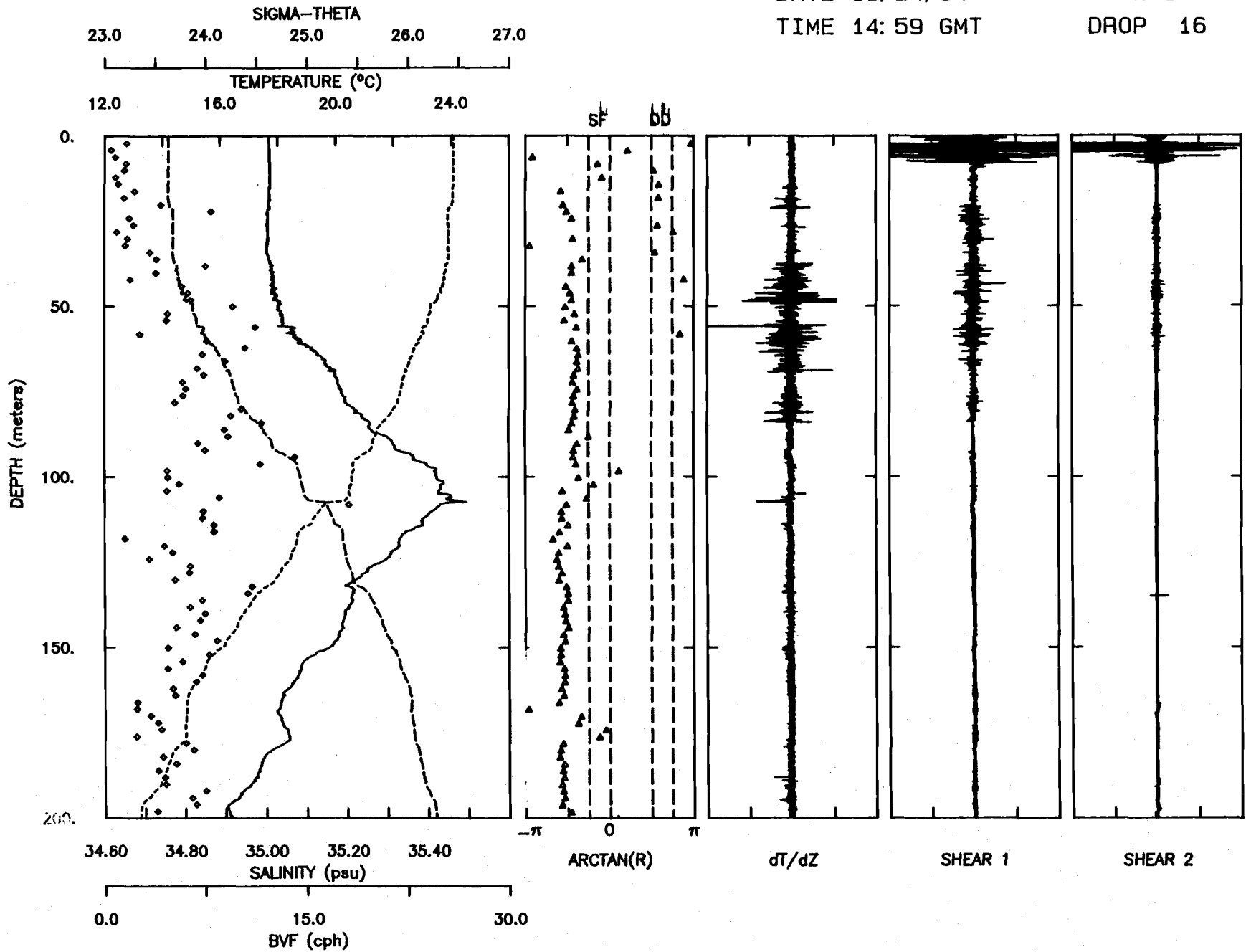
DATE 11/24/84
TIME 14:05 GMT

TAPE 116
DROP 10



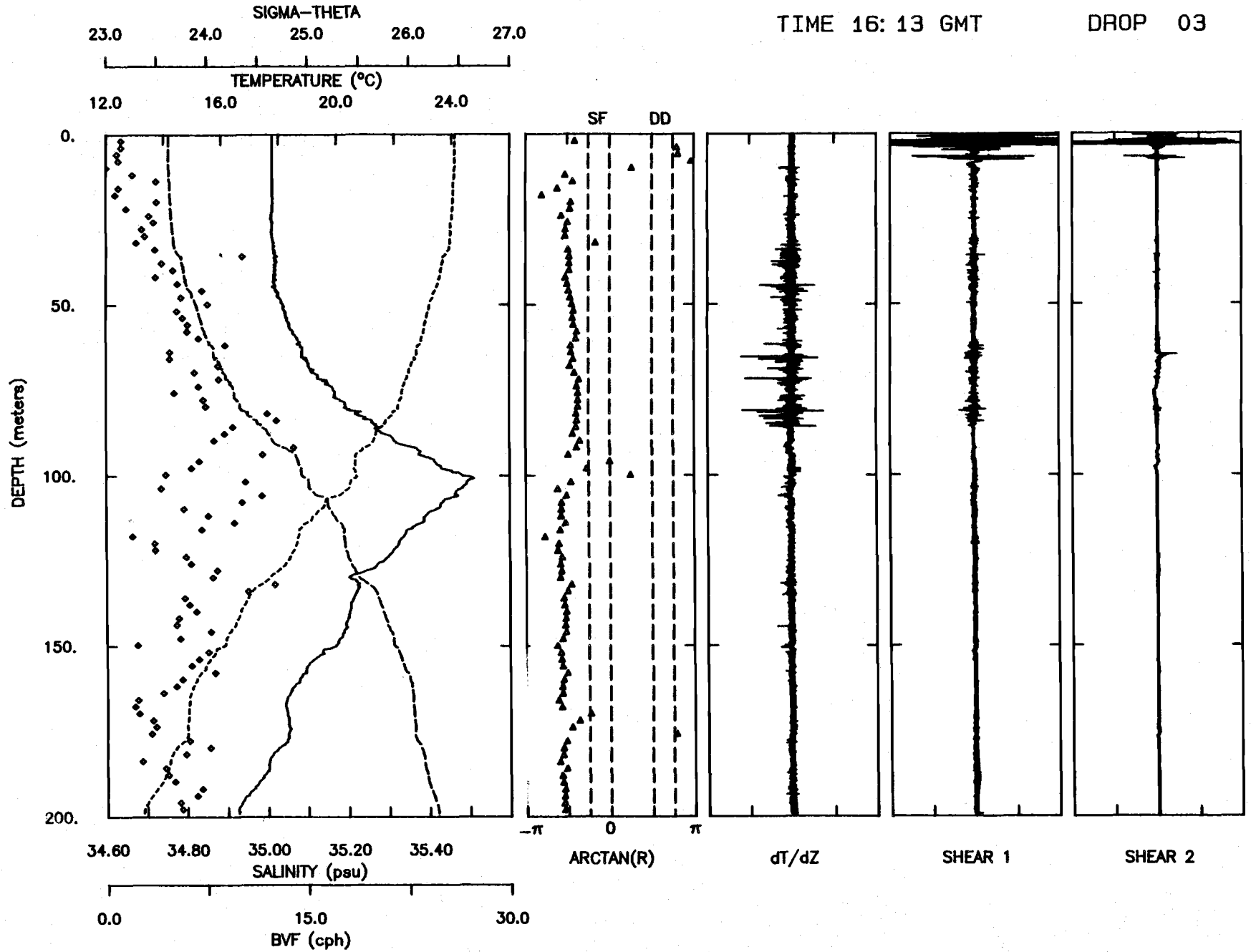
DATE 11/24/84
TIME 14:59 GMT

TAPE 116
DROP 16



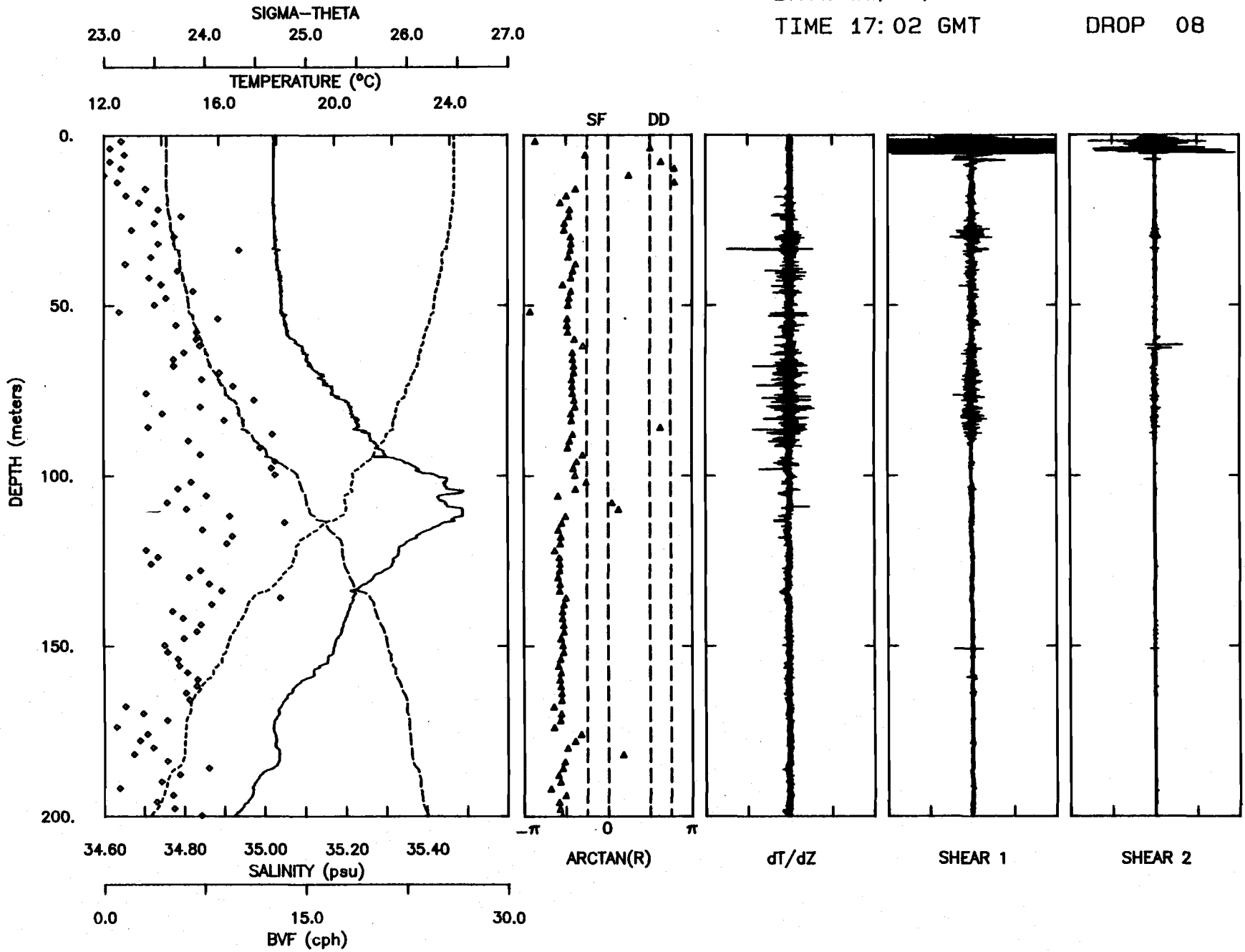
DATE 11/24/84
TIME 16:13 GMT

TAPE 117
DROP 03



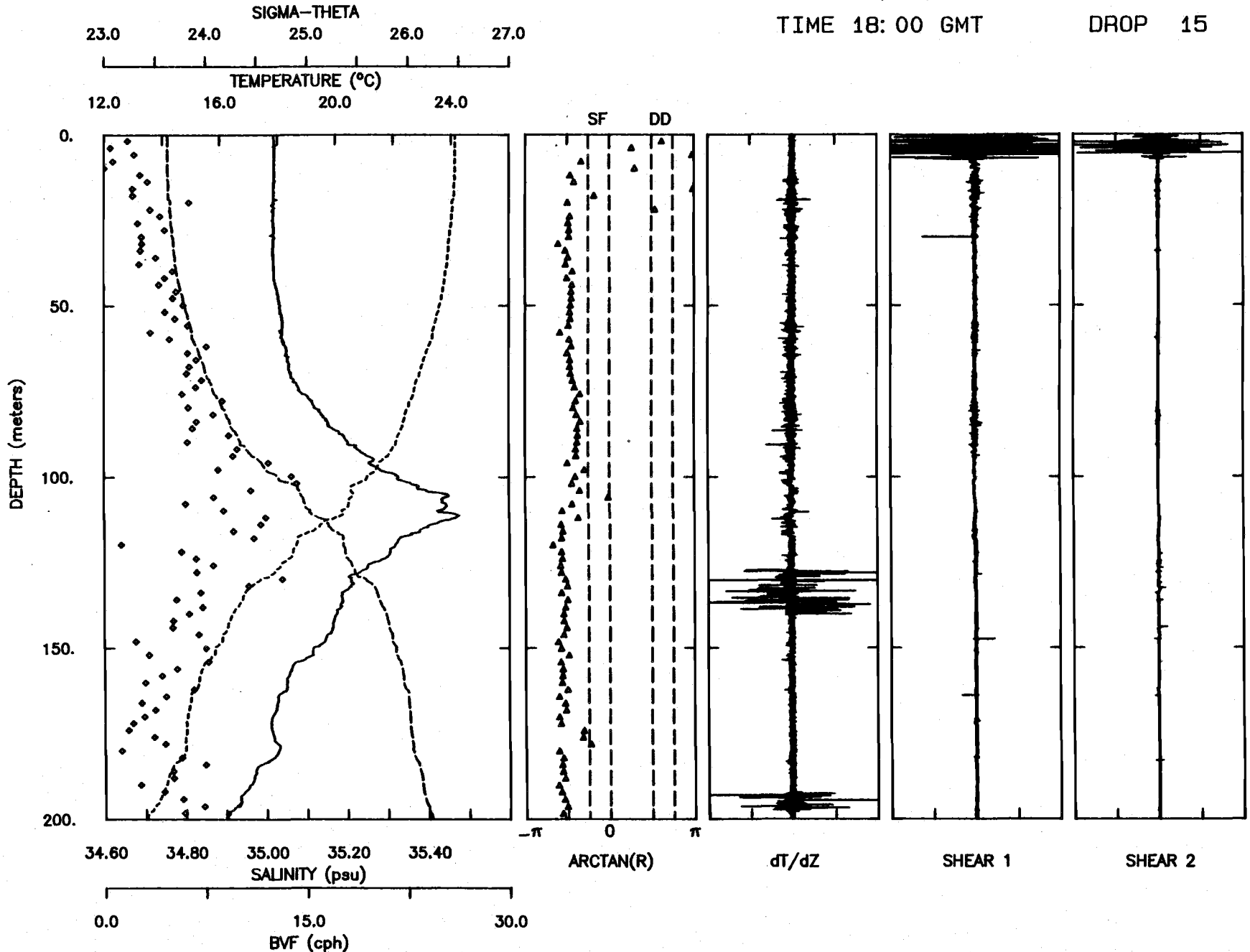
DATE 11/24/84
TIME 17:02 GMT

TAPE 117
DROP 08



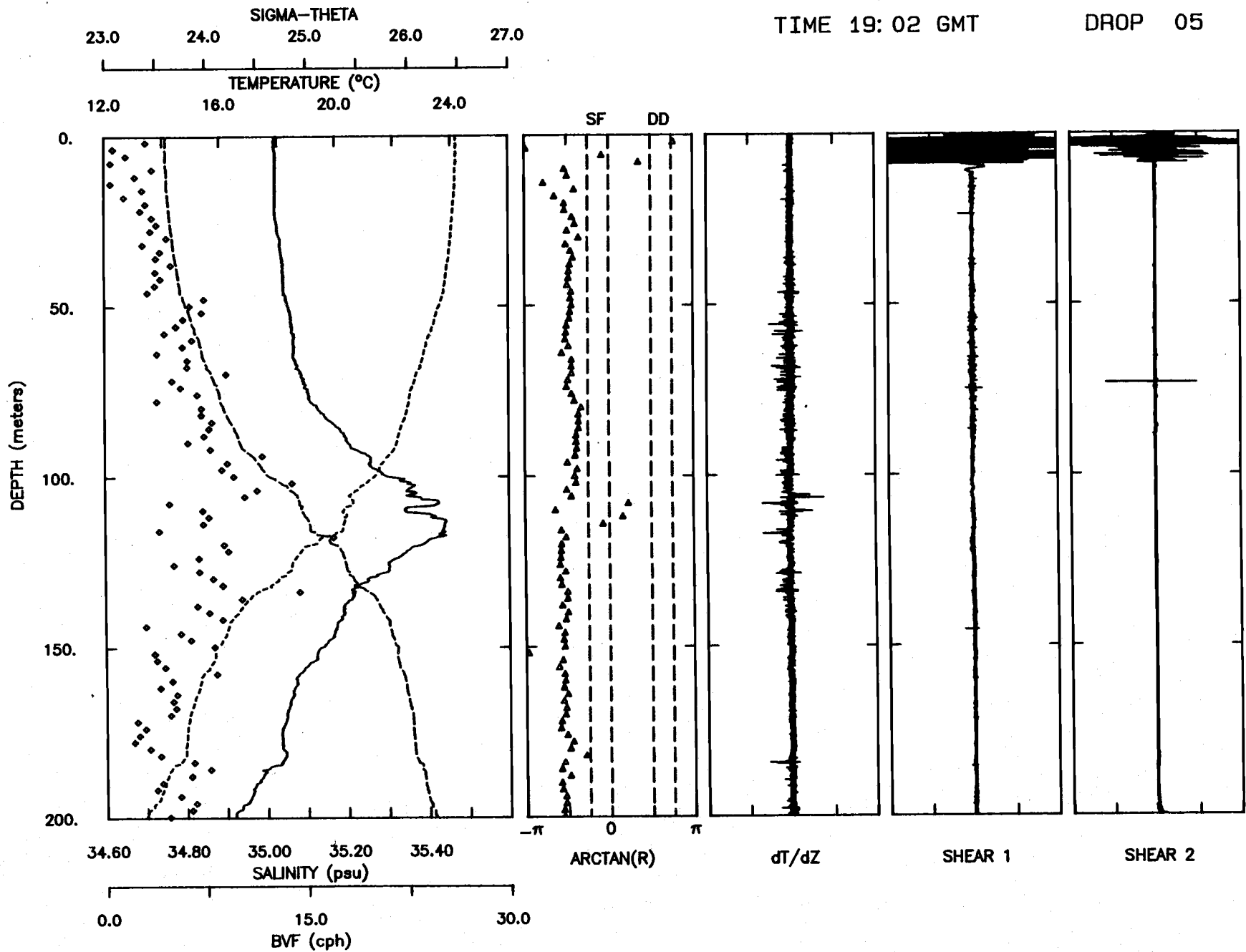
DATE 11/24/84
TIME 18:00 GMT

TAPE 117
DROP 15



DATE 11/24/84
TIME 19:02 GMT

TAPE 118
DROP 05

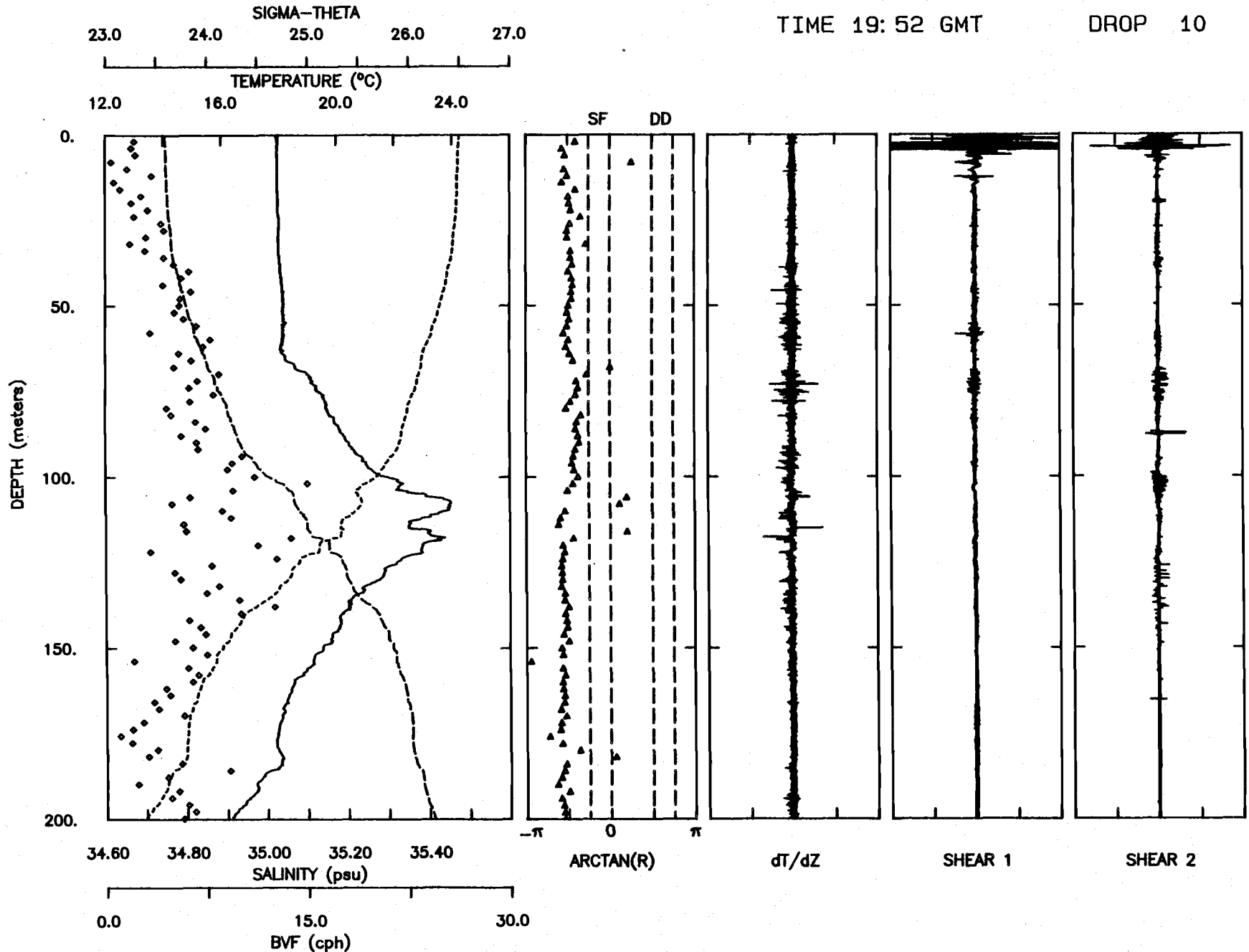


DATE 11/24/84

TAPE 118

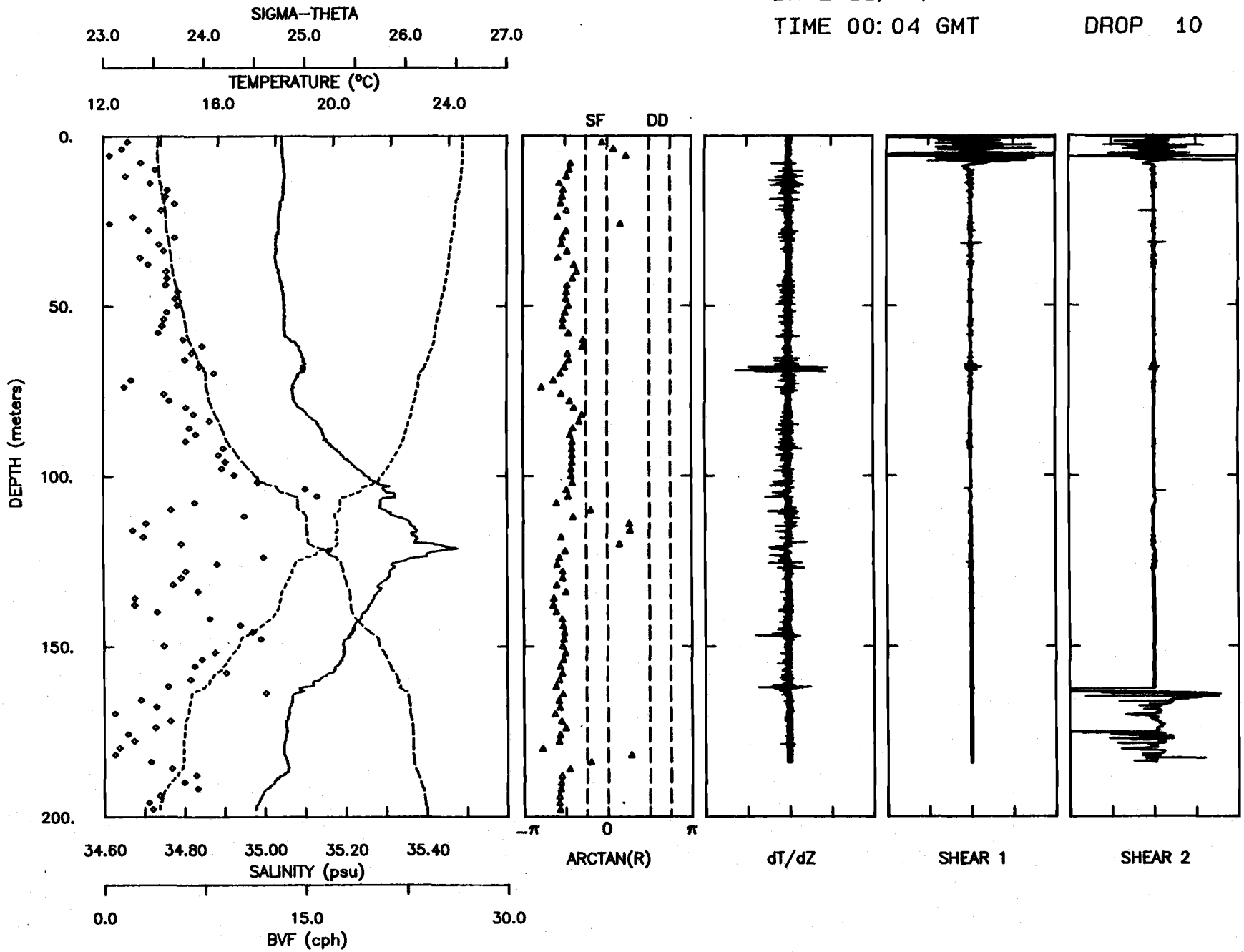
TIME 19:52 GMT

DROP 10



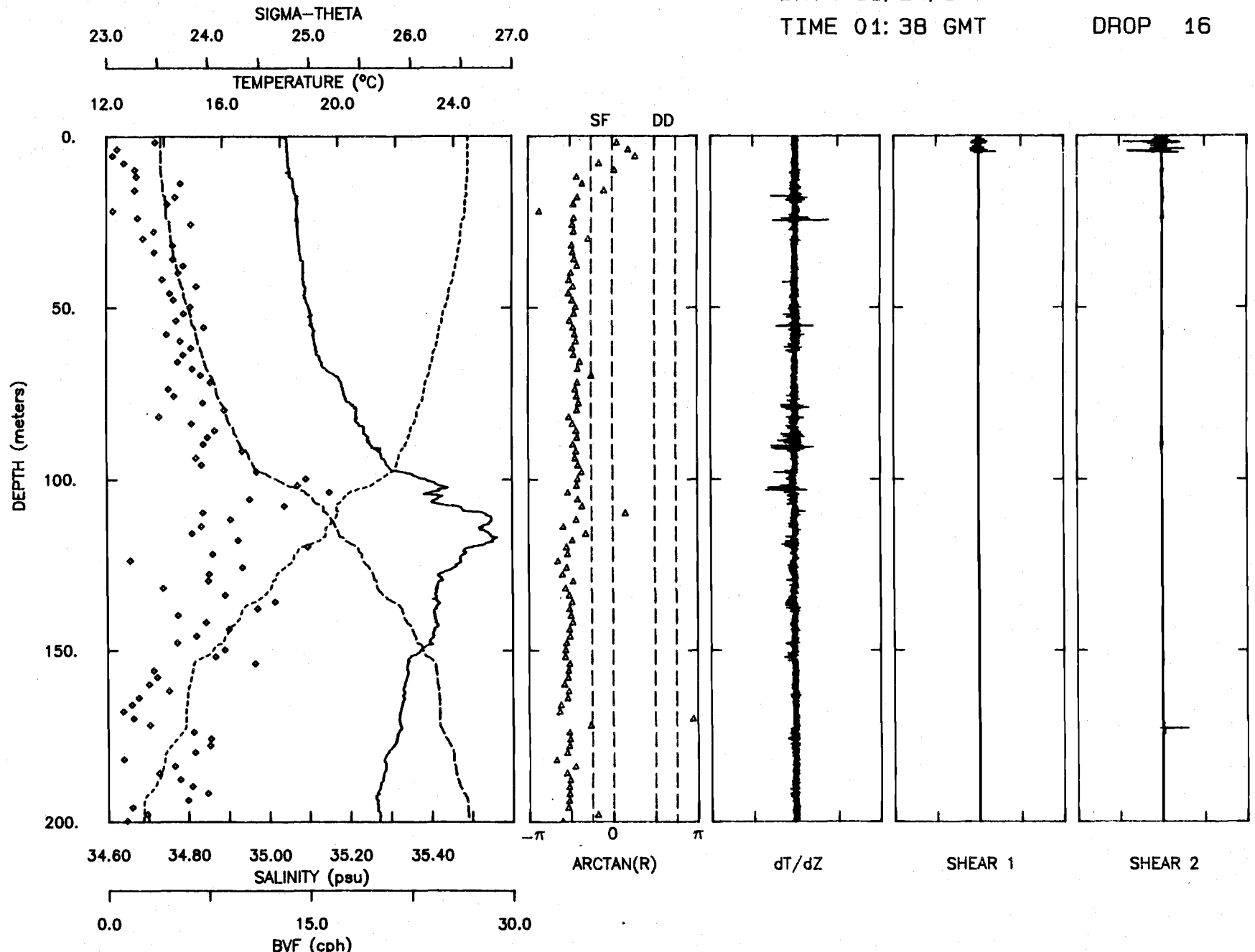
DATE 11/25/84
TIME 00:04 GMT

TAPE 119
DROP 10



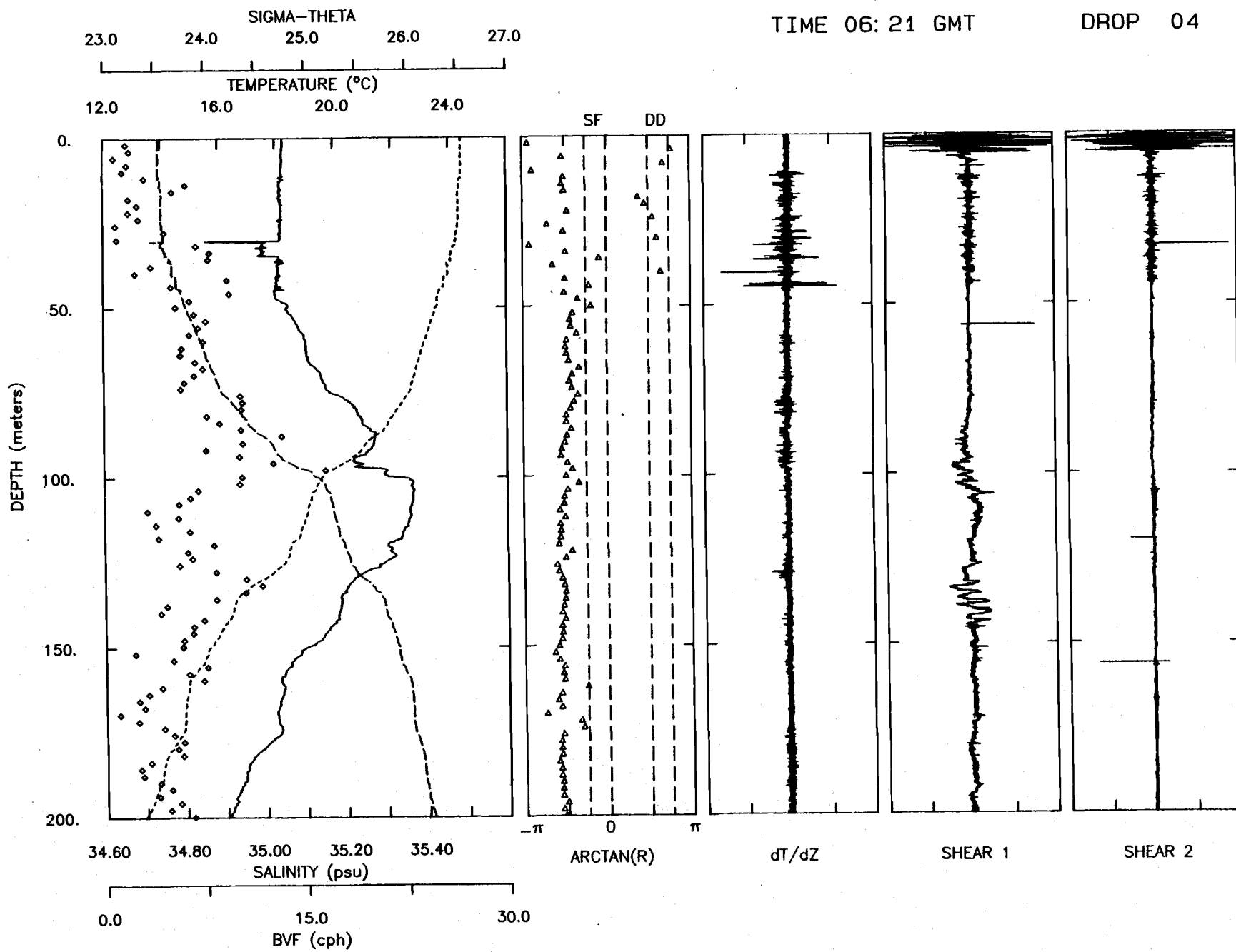
DATE 11/24/84
TIME 01:38 GMT

TAPE 119
DROP 16



DATE 11/25/84
TIME 06: 21 GMT

TAPE 121
DROP 04

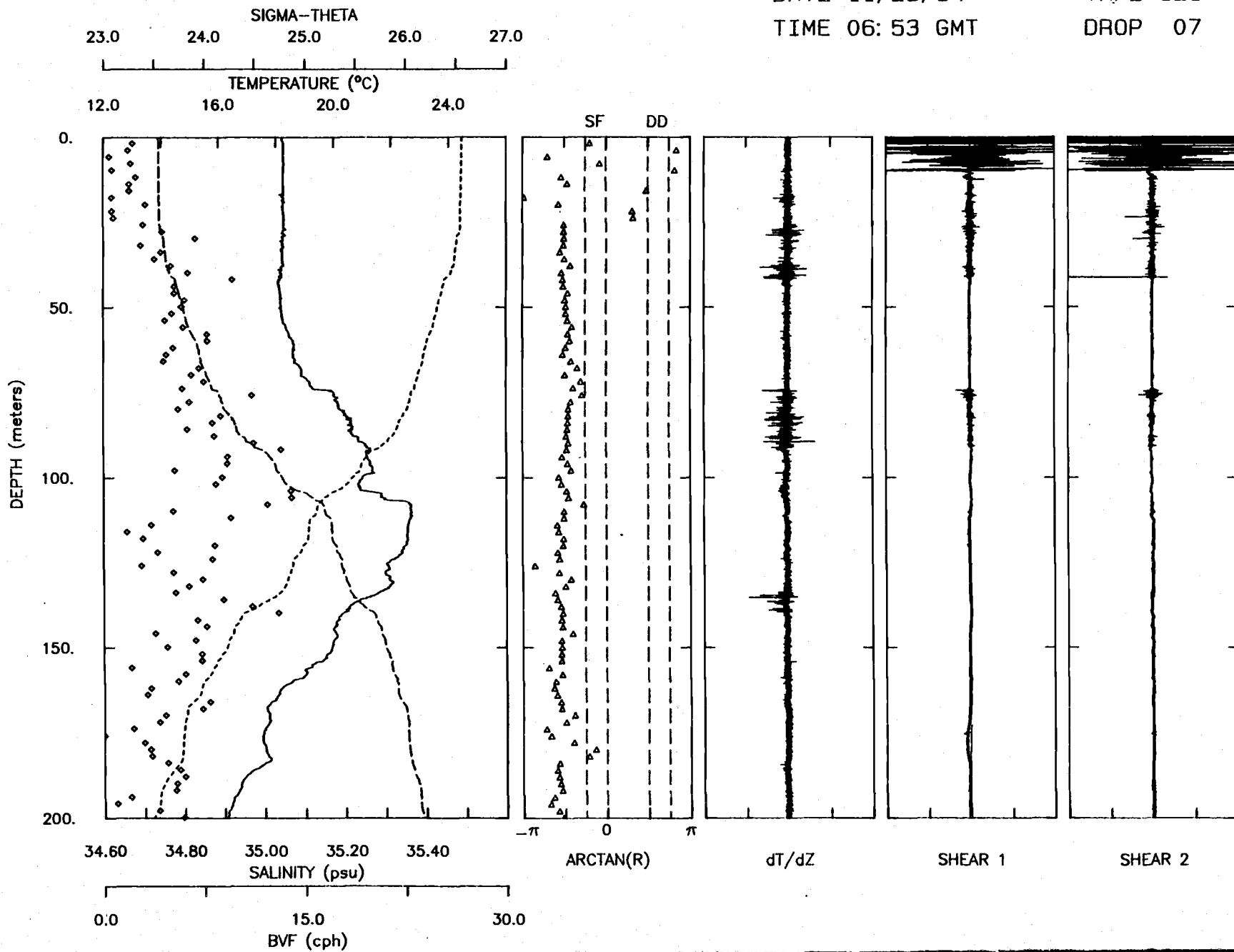


DATE 11/25/84

TAPE 121

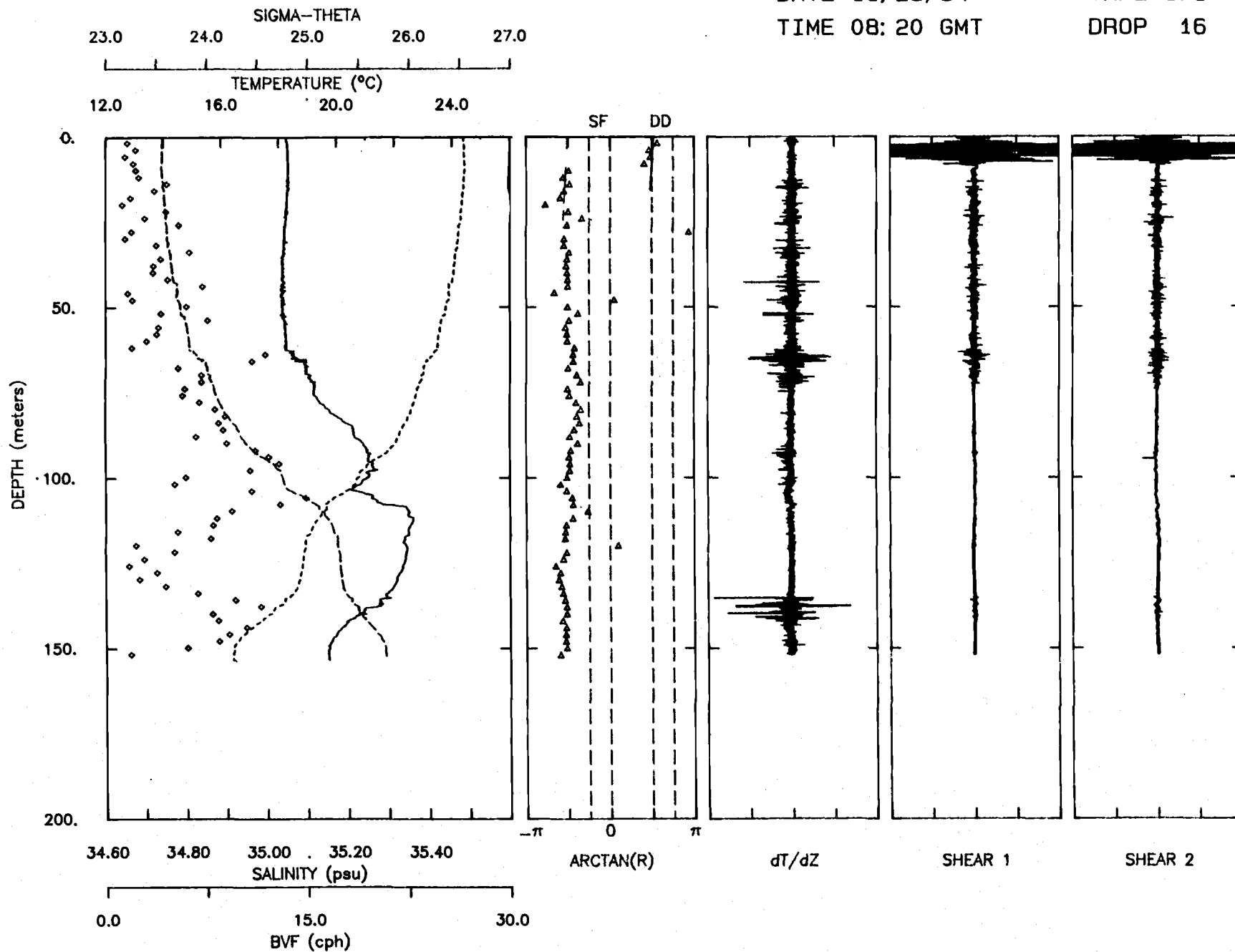
TIME 06:53 GMT

DROP 07



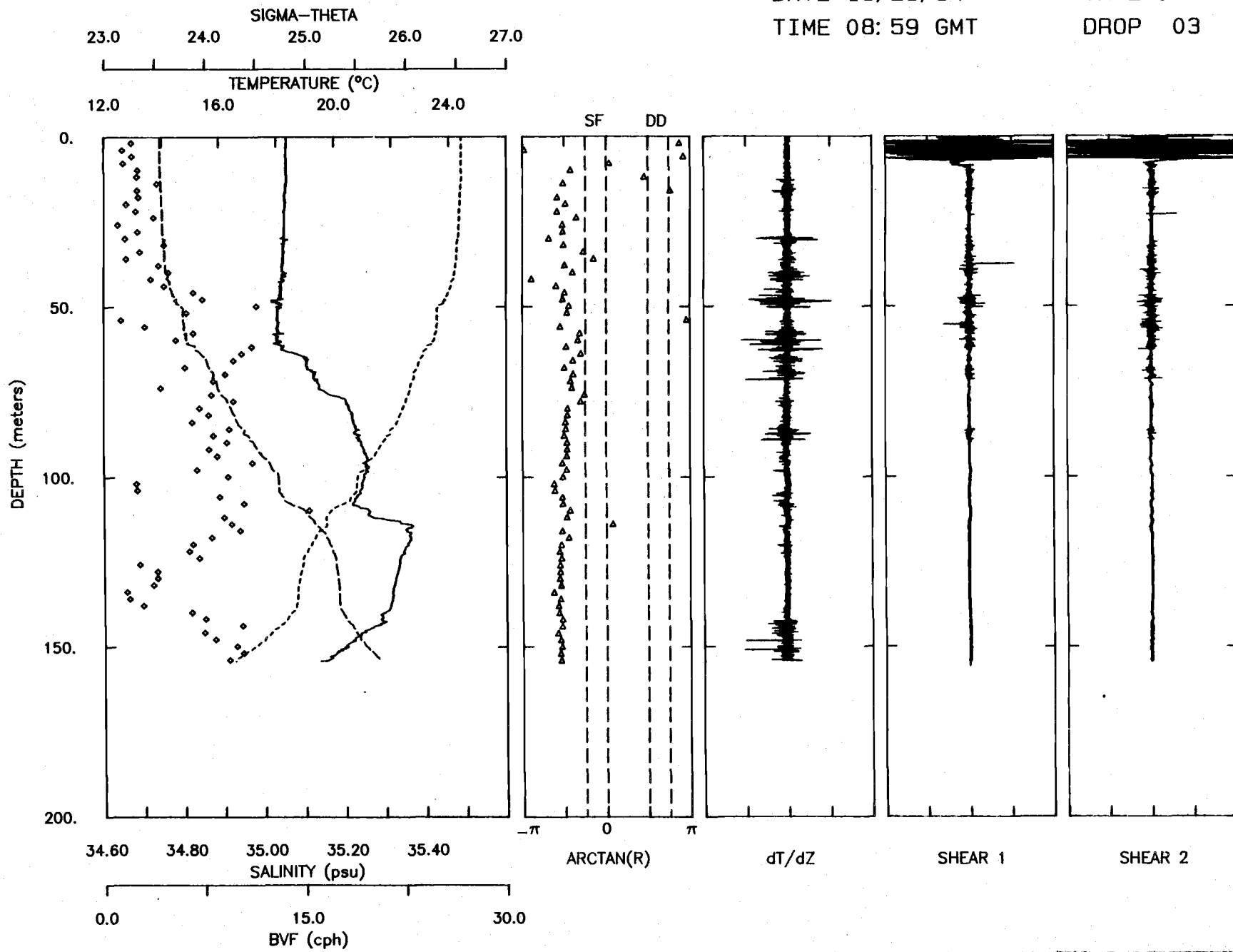
DATE 11/25/84
TIME 08:20 GMT

TAPE 121
DROP 16



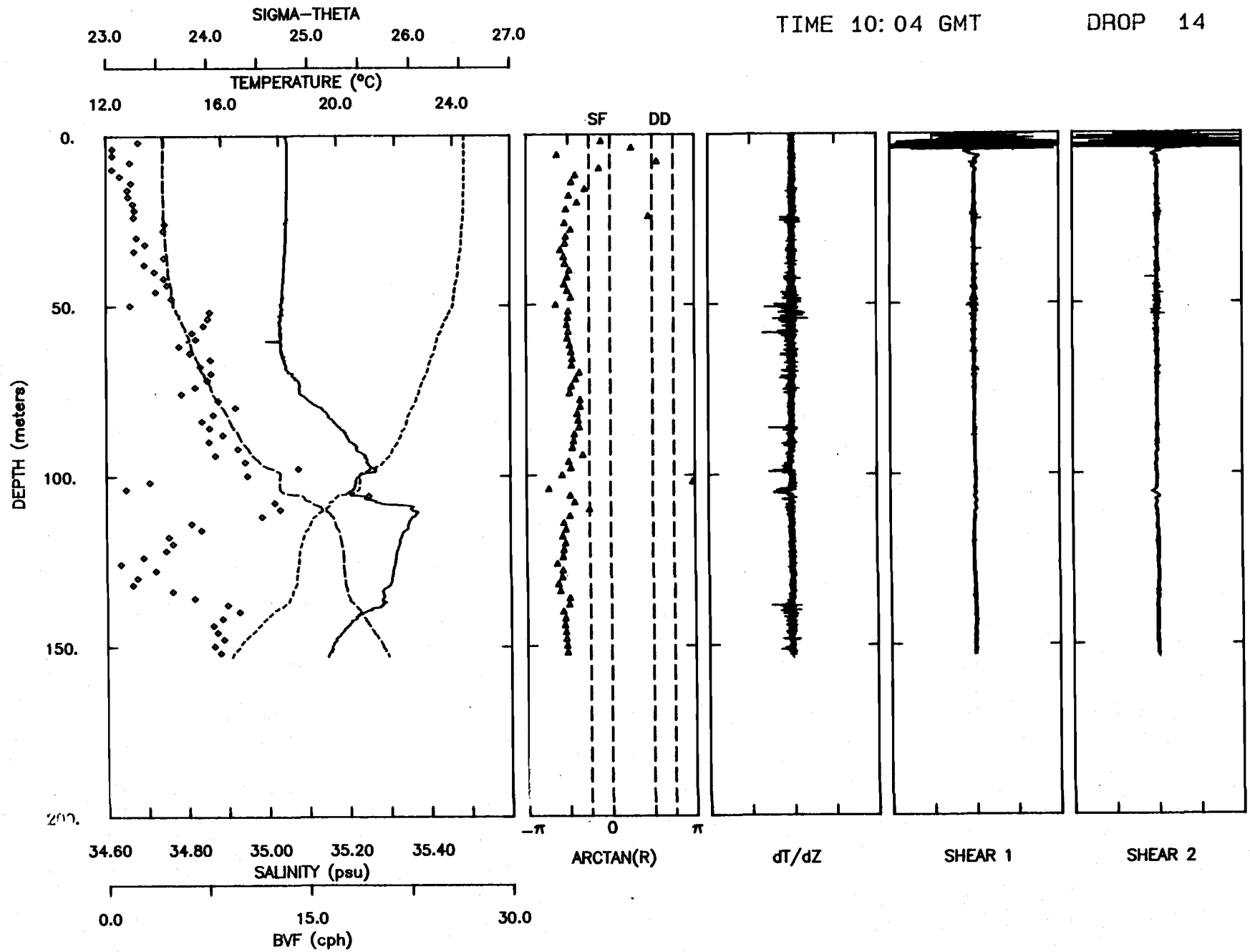
DATE 11/25/84
TIME 08:59 GMT

TAPE 122
DROP 03



DATE 11/25/84
TIME 10:04 GMT

TAPE 122
DROP 14

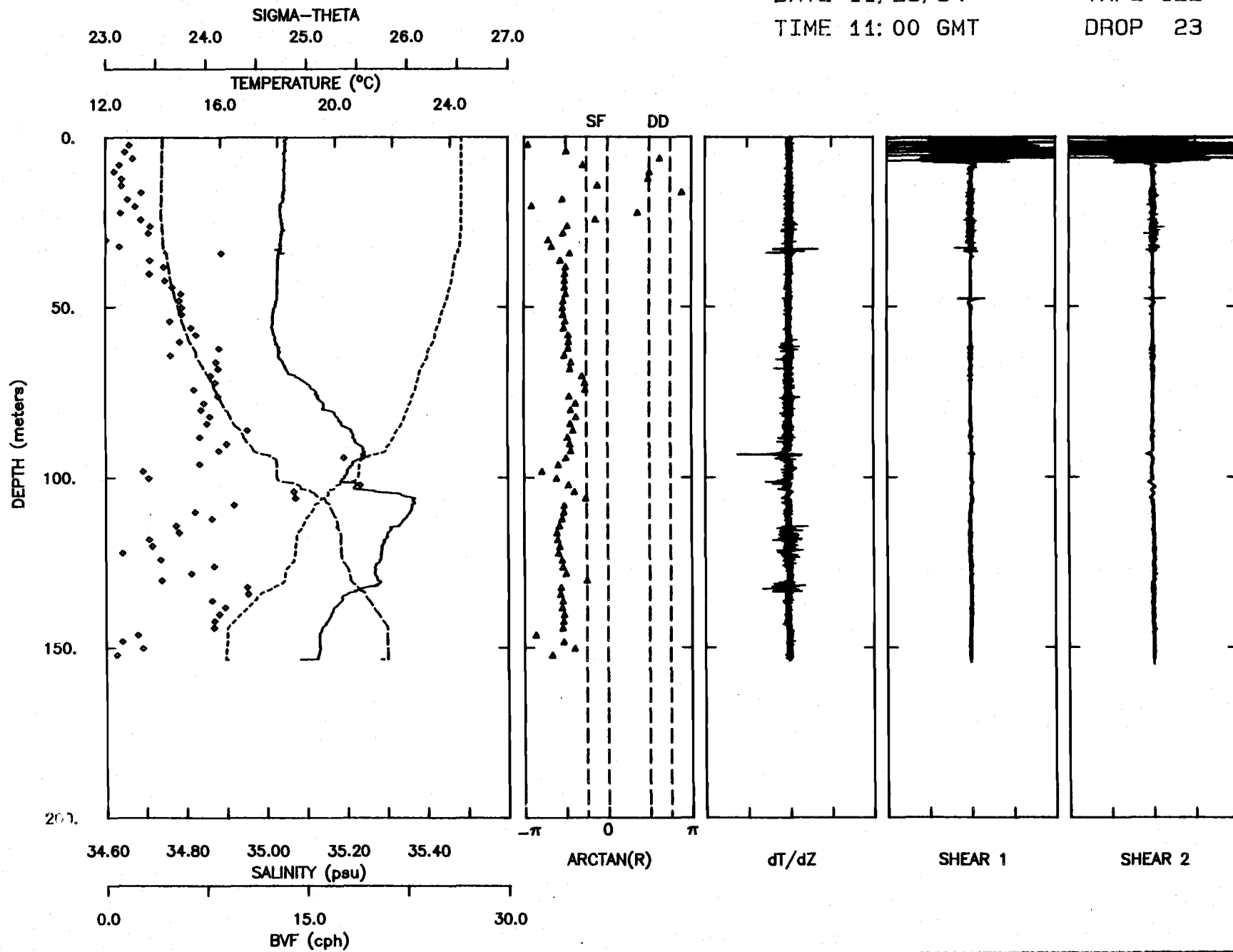


DATE 11/25/84

TAPE 122

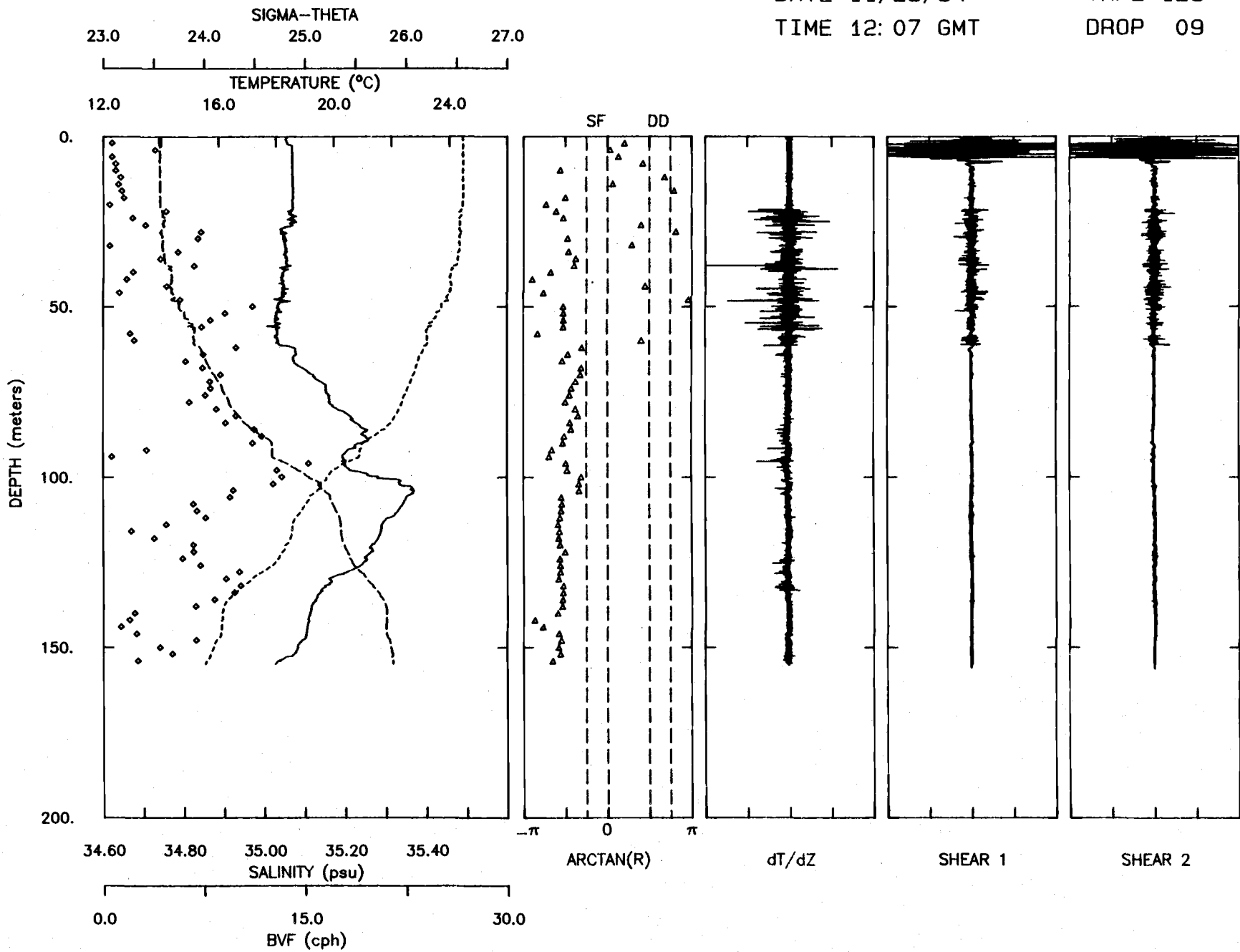
TIME 11:00 GMT

DROP 23



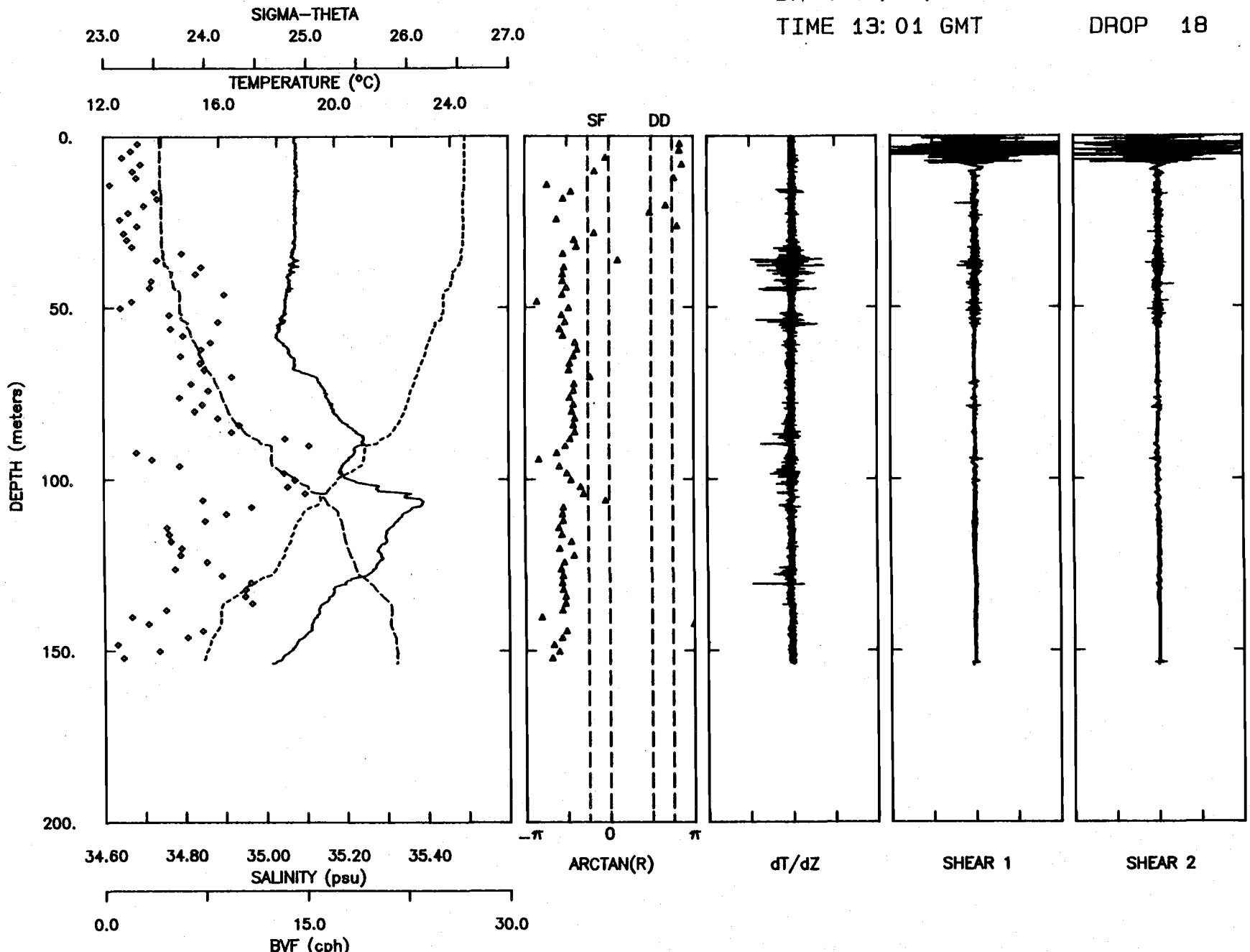
DATE 11/25/84
TIME 12:07 GMT

TAPE 123
DROP 09



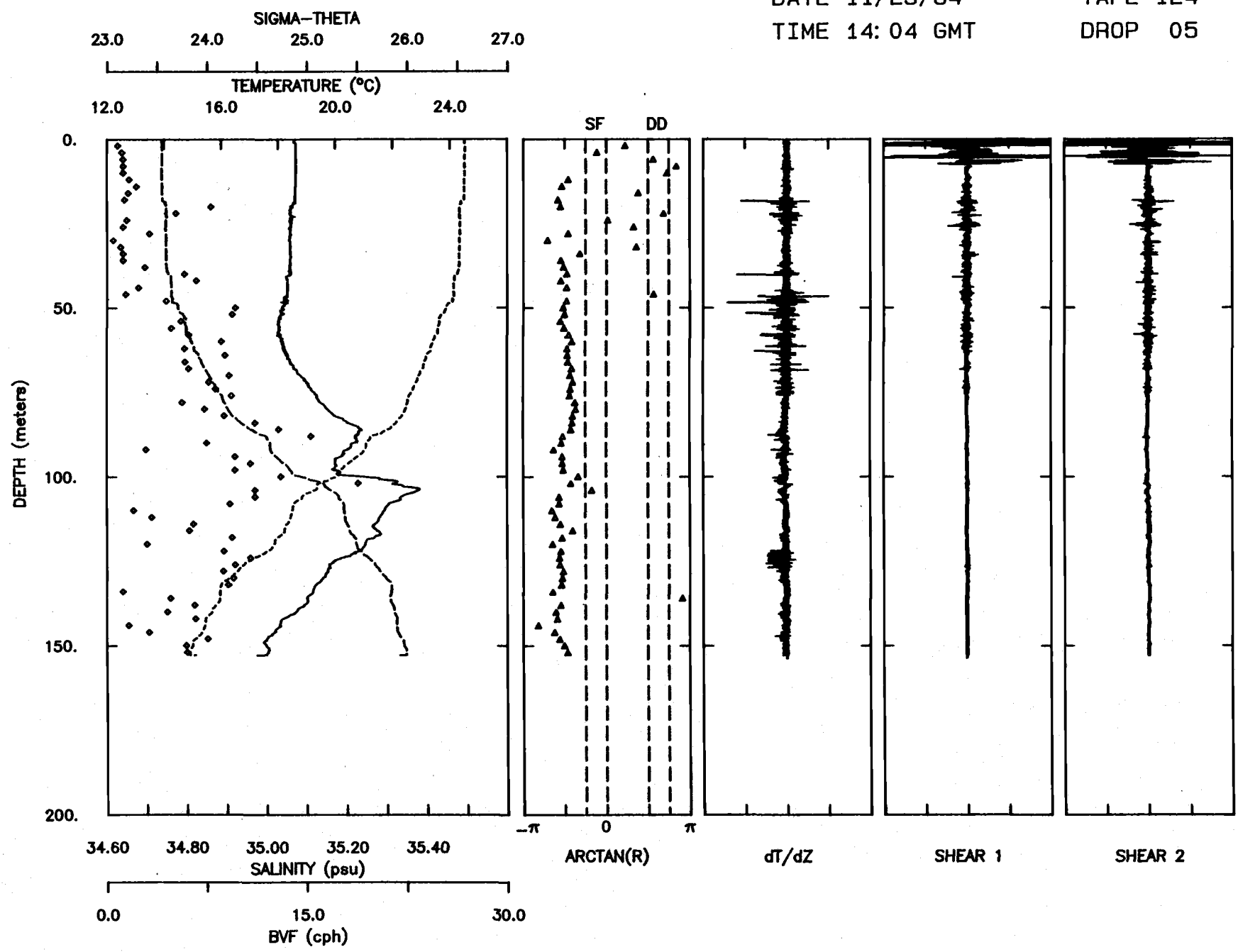
DATE 11/25/84
TIME 13:01 GMT

TAPE 123
DROP 18



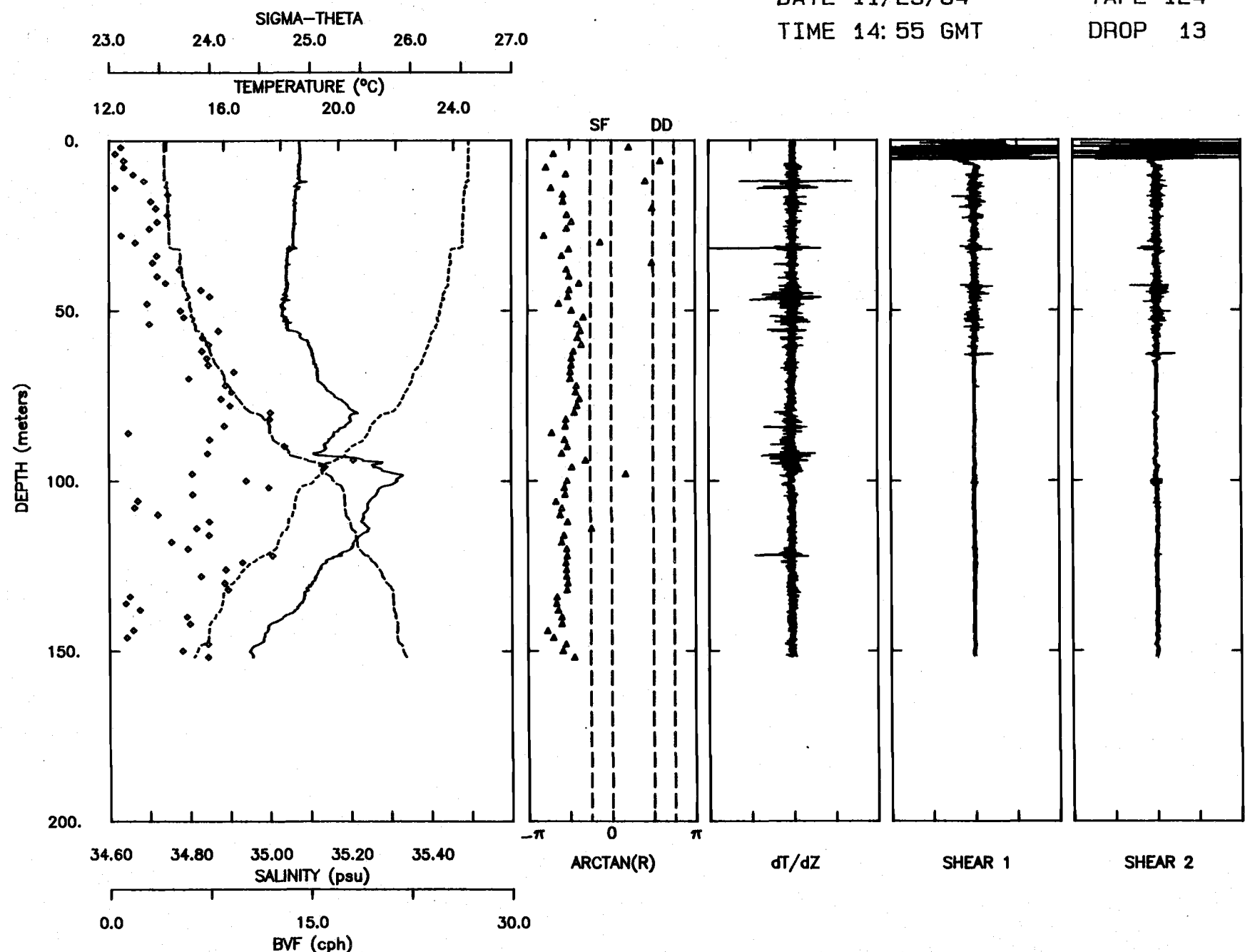
DATE 11/25/84
TIME 14:04 GMT

TAPE 124
DROP 05



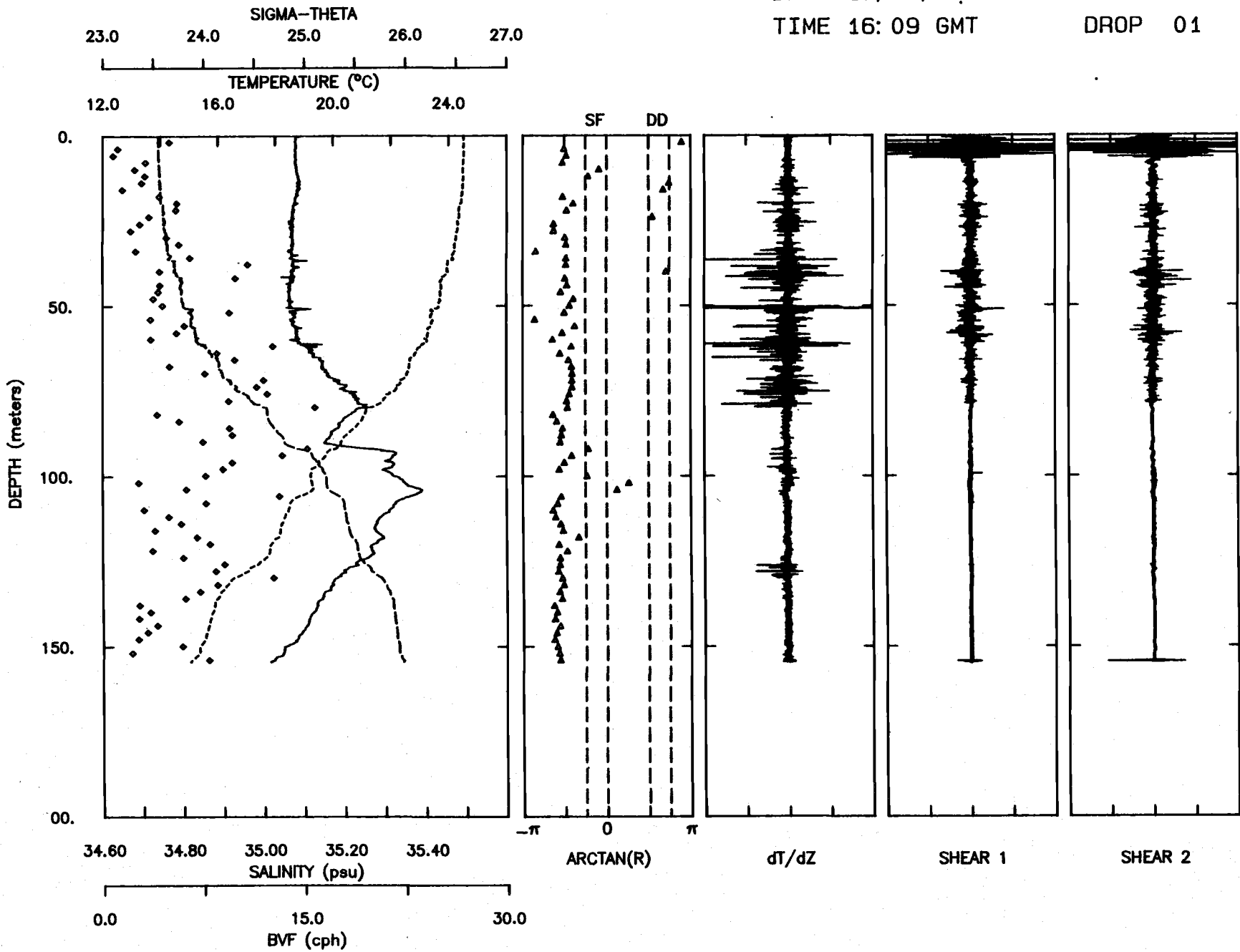
DATE 11/25/84
TIME 14:55 GMT

TAPE 124
DROP 13



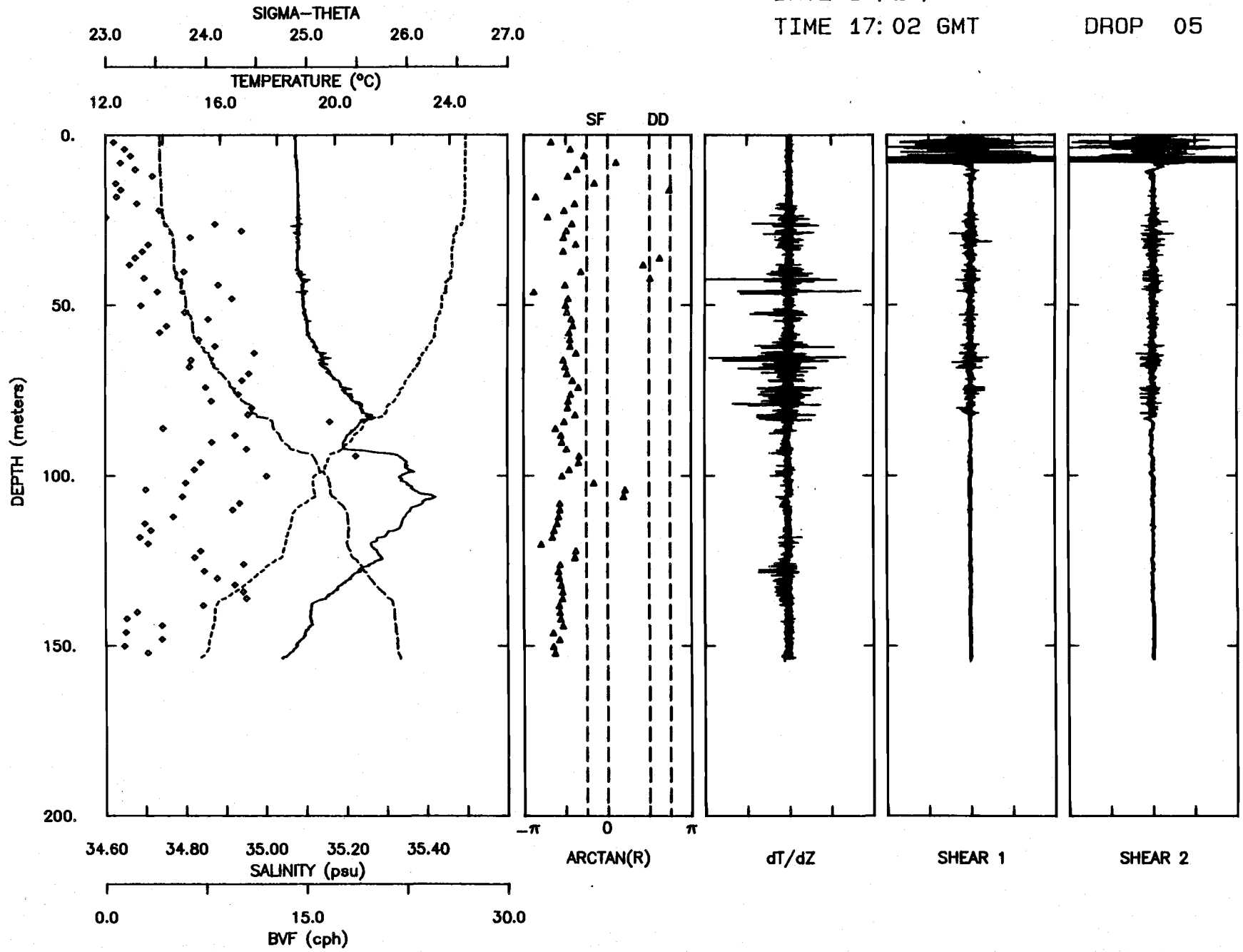
DATE 11/25/84
TIME 16:09 GMT

TAPE 125
DROP 01



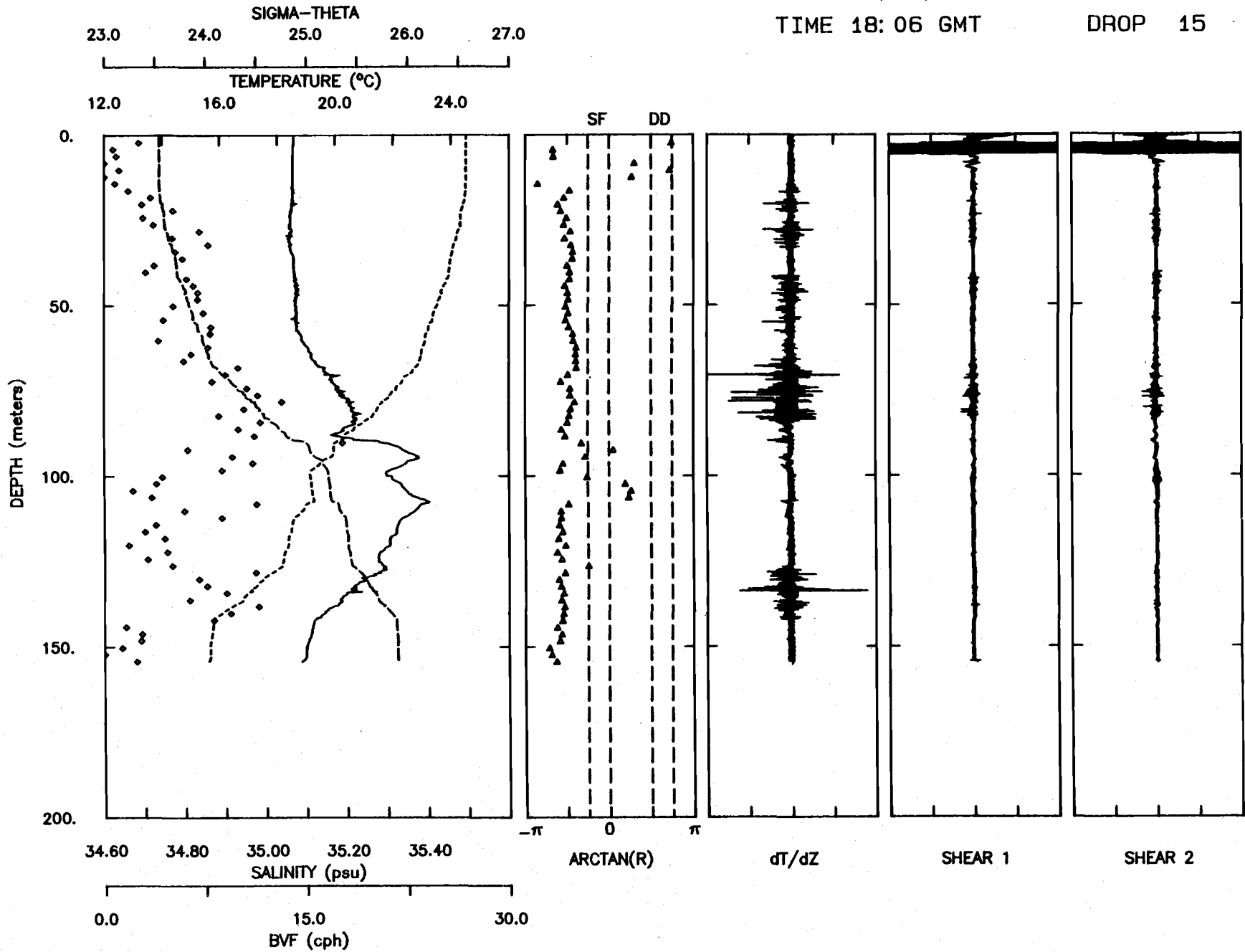
DATE 11/25/84
TIME 17:02 GMT

TAPE 125
DROP 05



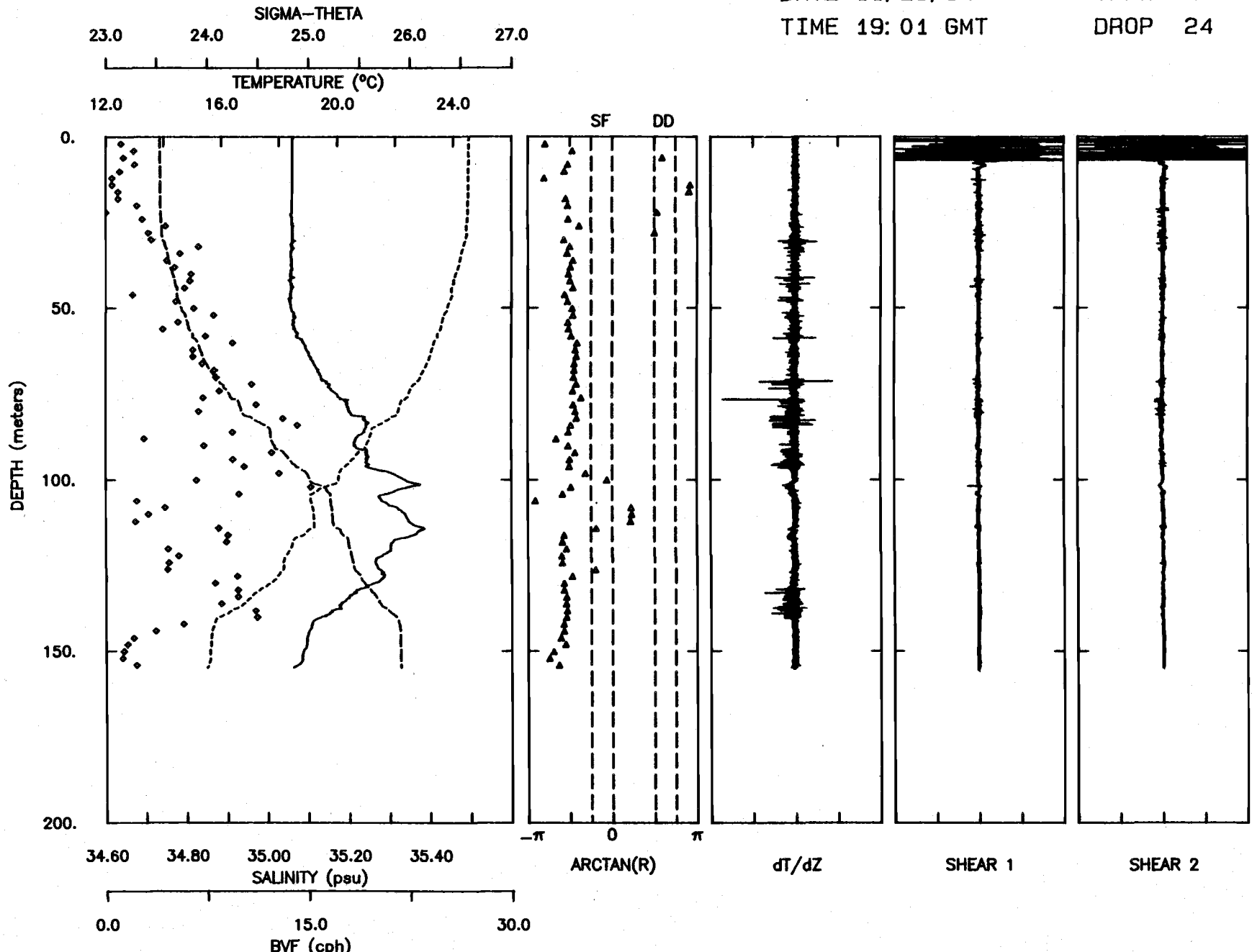
DATE 11/25/84
TIME 18:06 GMT

TAPE 125
DROP 15



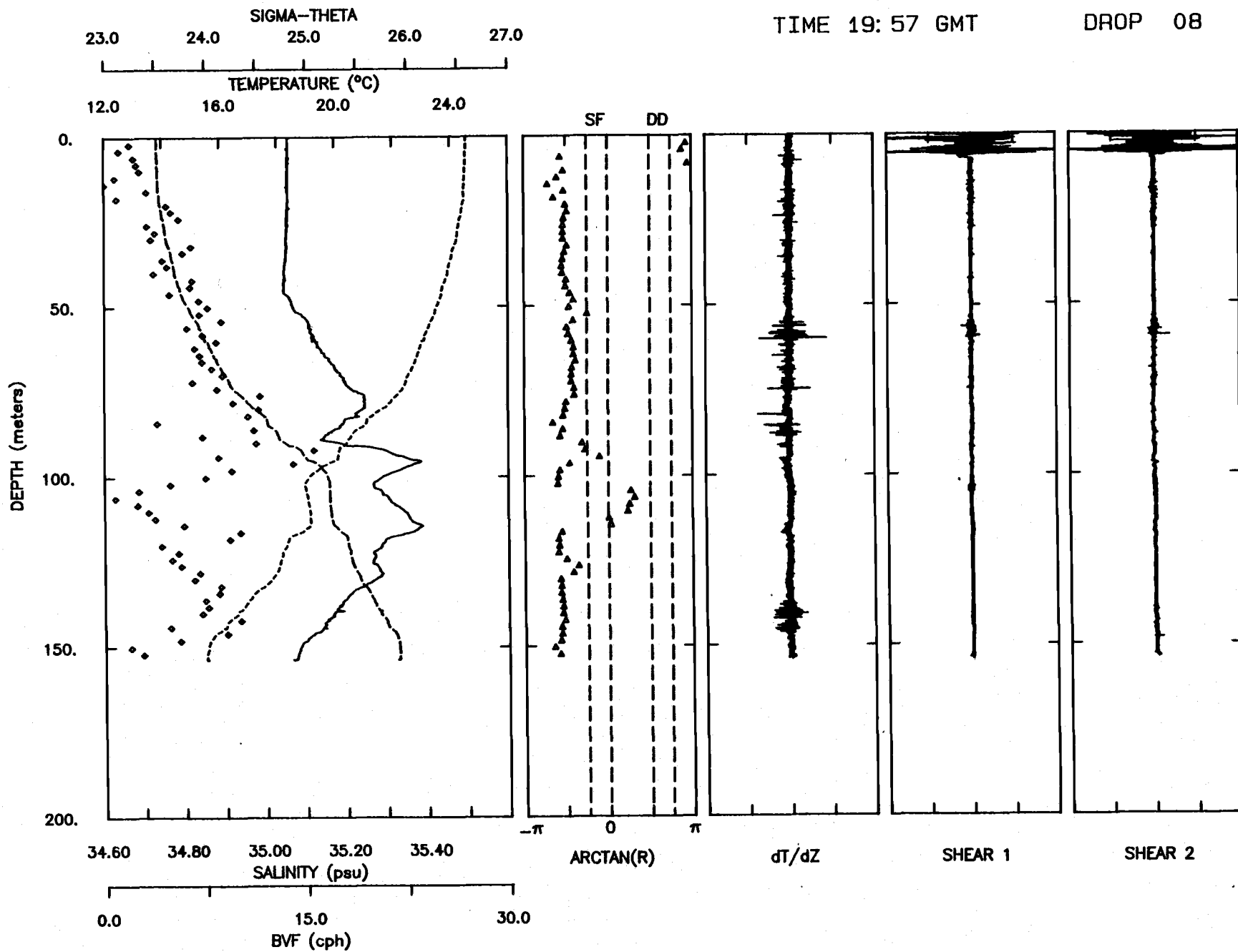
DATE 11/25/84
TIME 19:01 GMT

TAPE 125
DROP 24



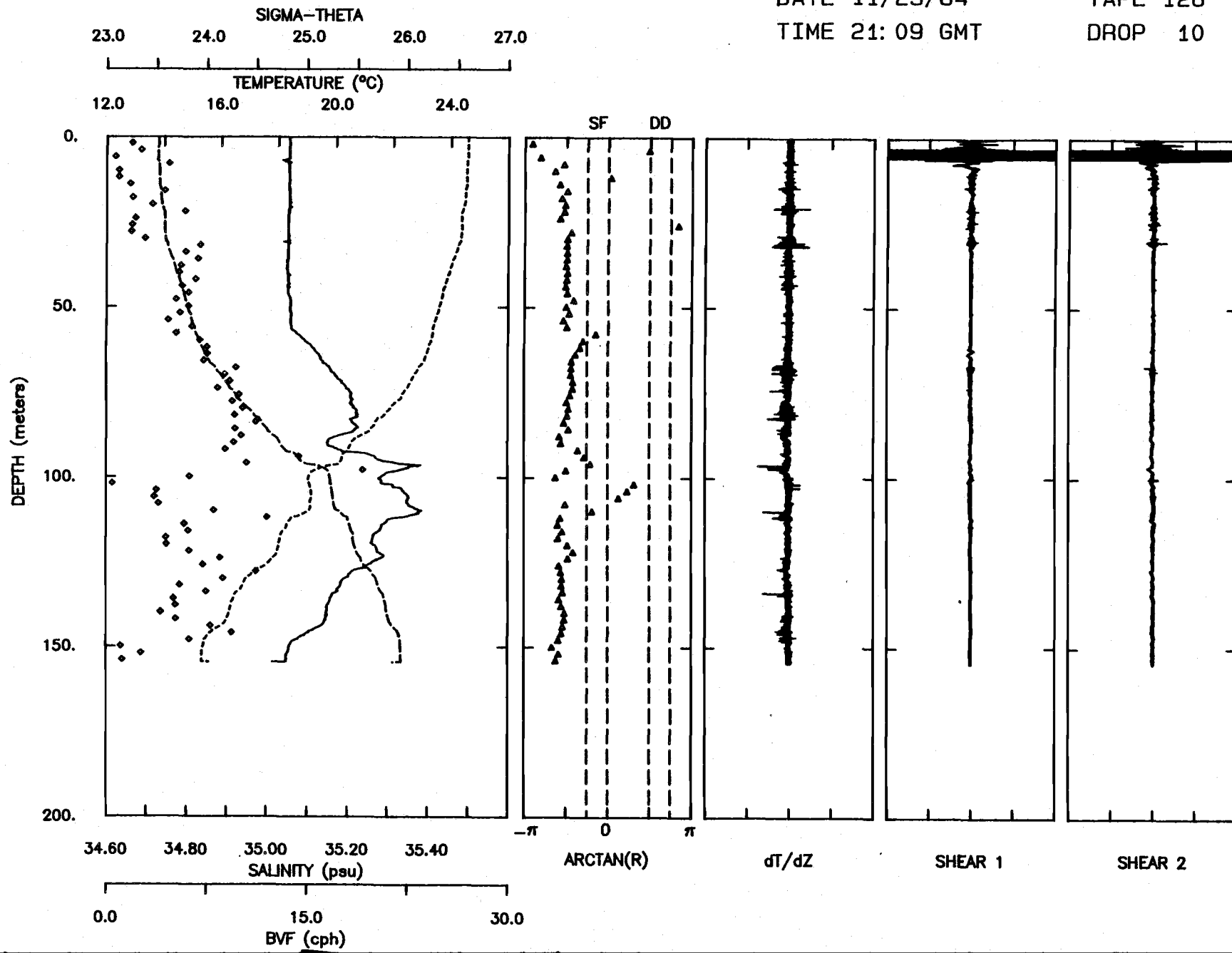
DATE 11/25/84
TIME 19:57 GMT

TAPE 126
DROP 08



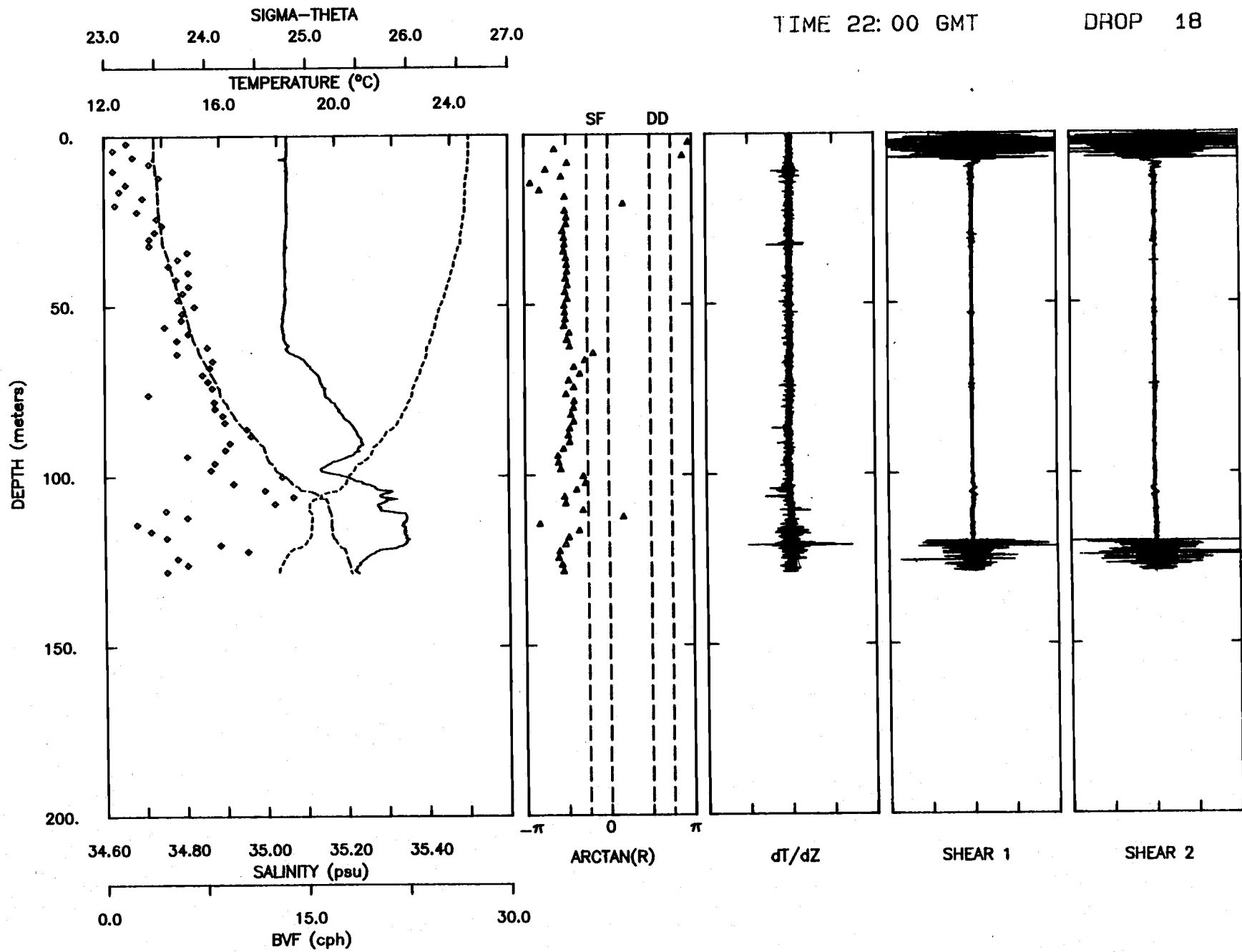
DATE 11/25/84
TIME 21:09 GMT

TAPE 126
DROP 10



DATE 11/25/84
TIME 22:00 GMT

TAPE 126
DROP 18

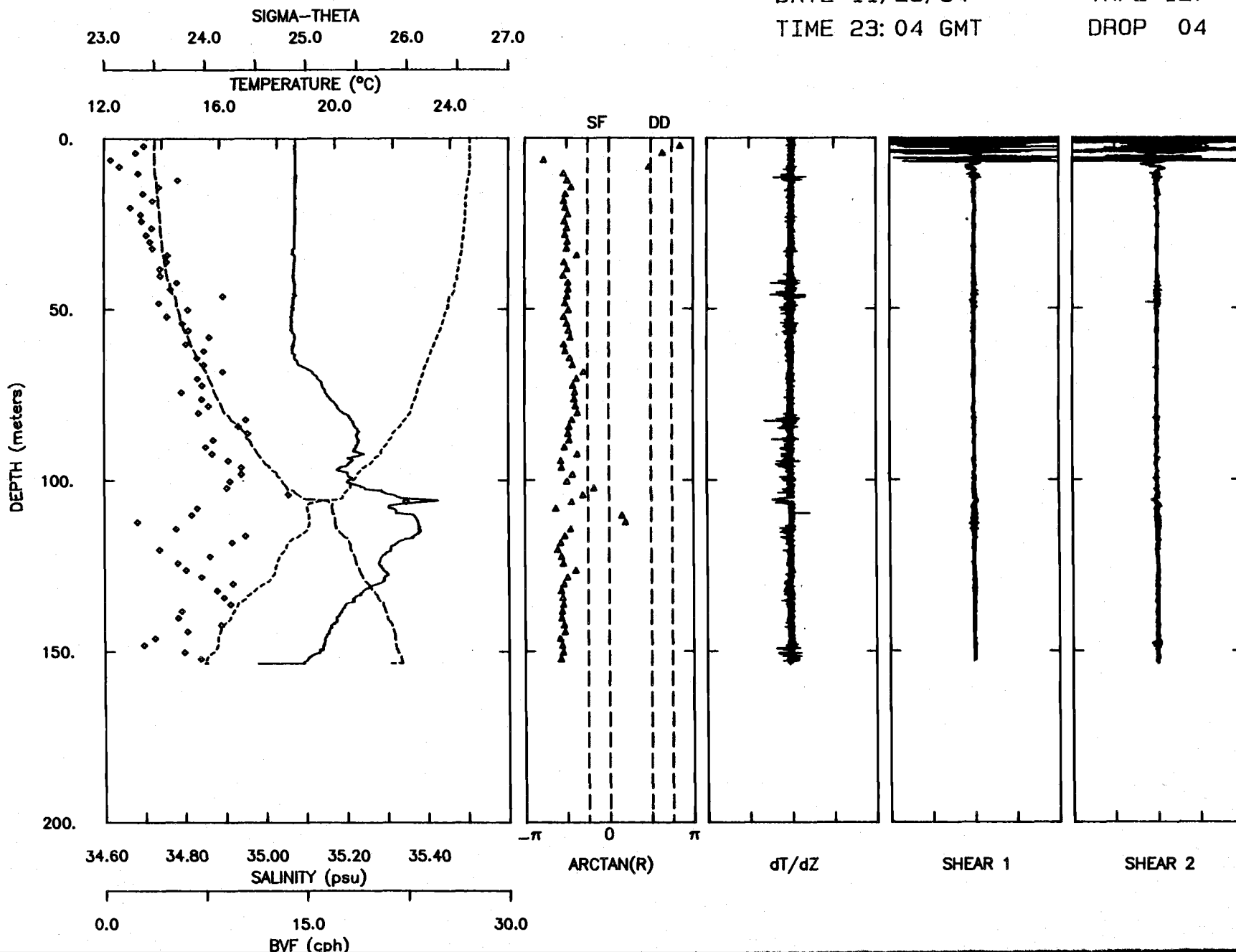


DATE 11/25/84

TAPE 127

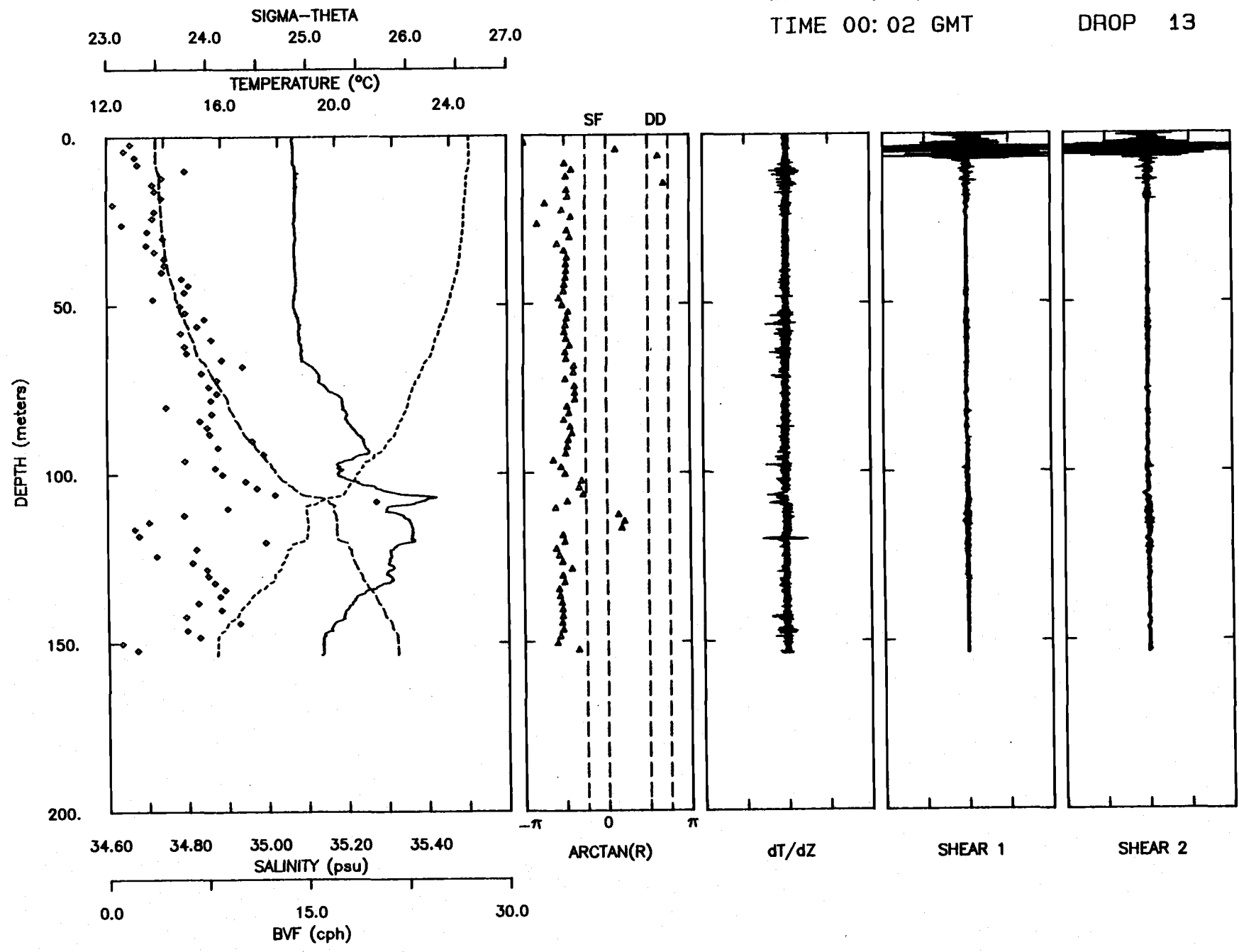
TIME 23:04 GMT

DROP 04



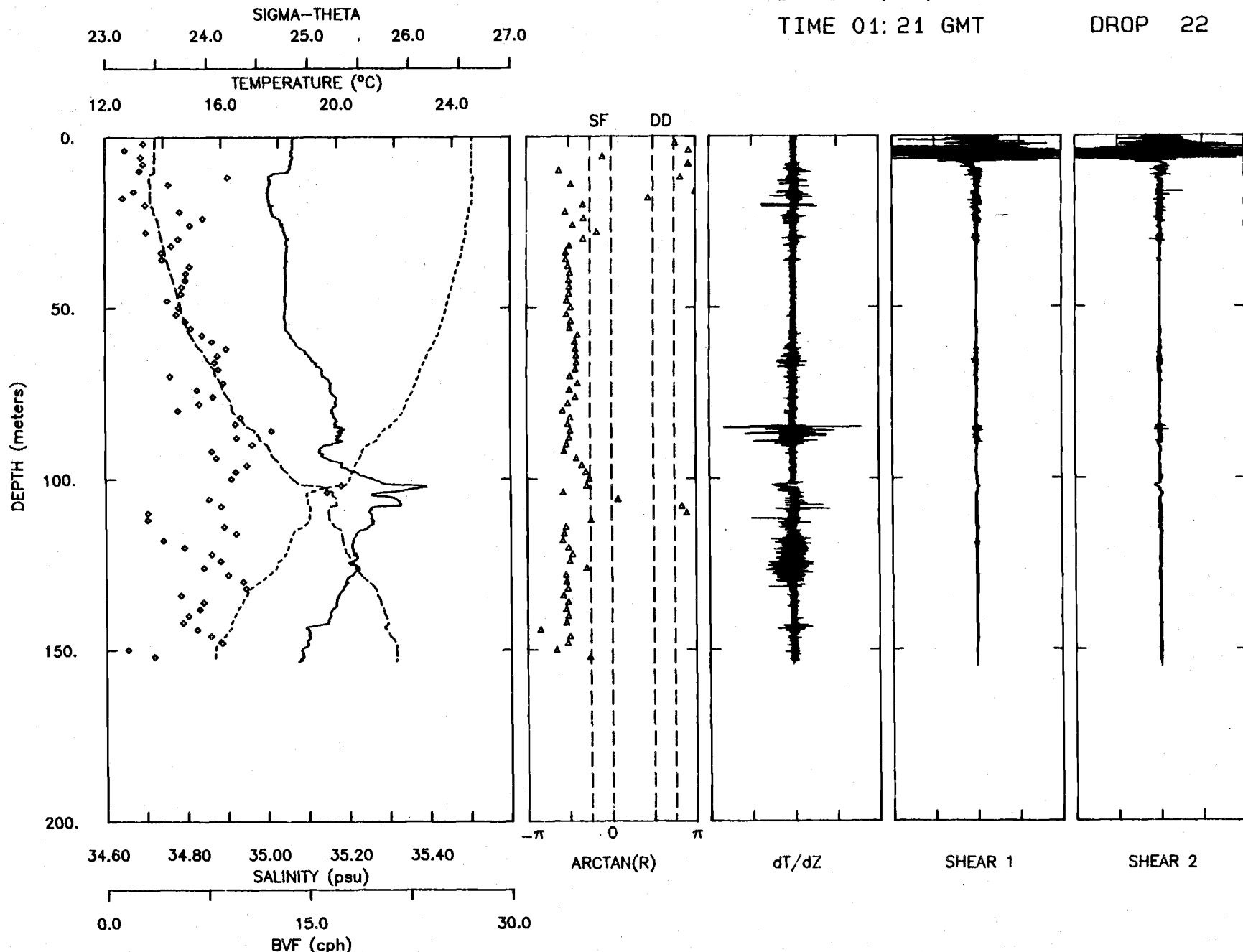
DATE 11/26/84
TIME 00:02 GMT

TAPE 127
DROP 13



DATE 11/26/84
TIME 01:21 GMT

TAPE 127
DROP 22

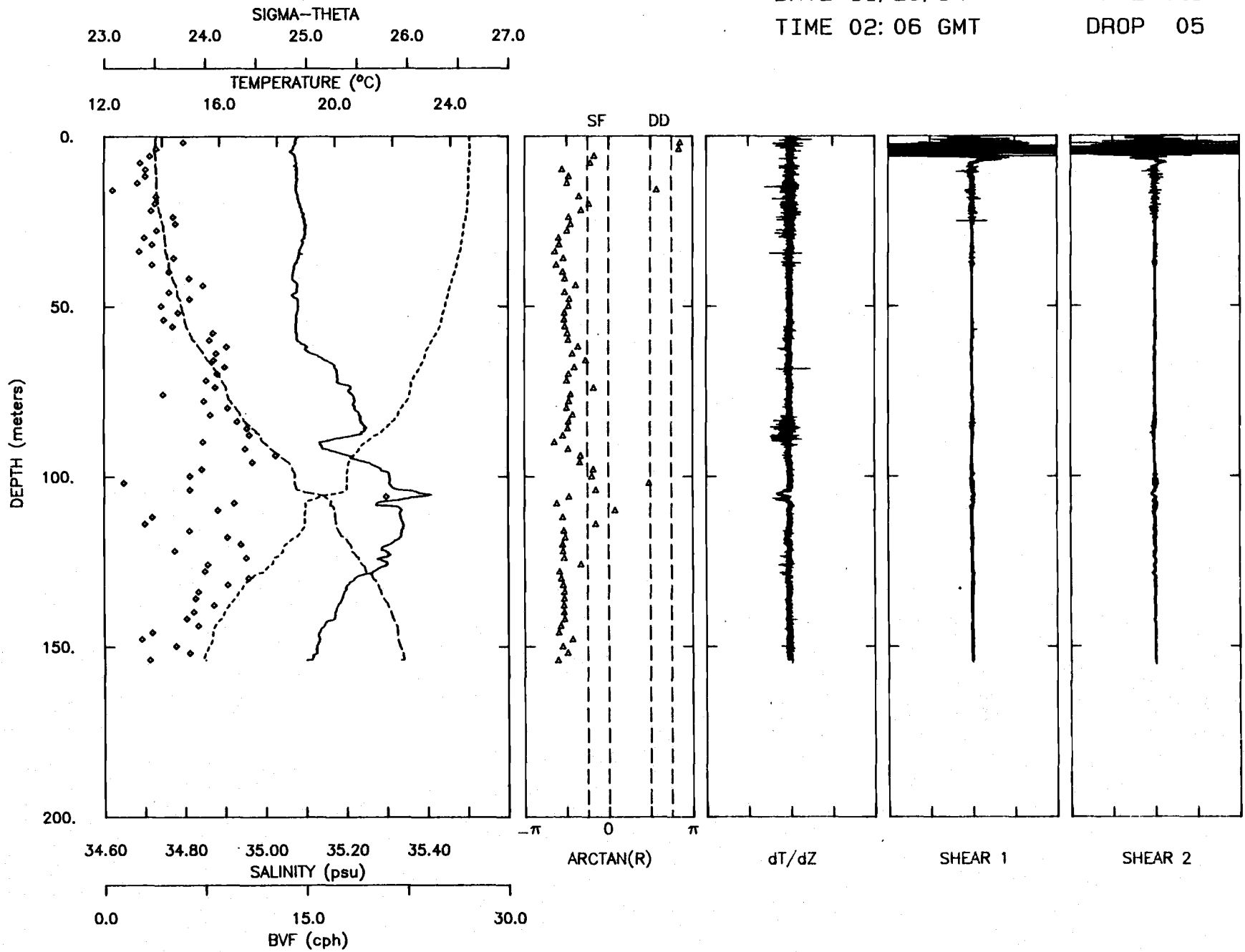


DATE 11/26/84

TAPE 128

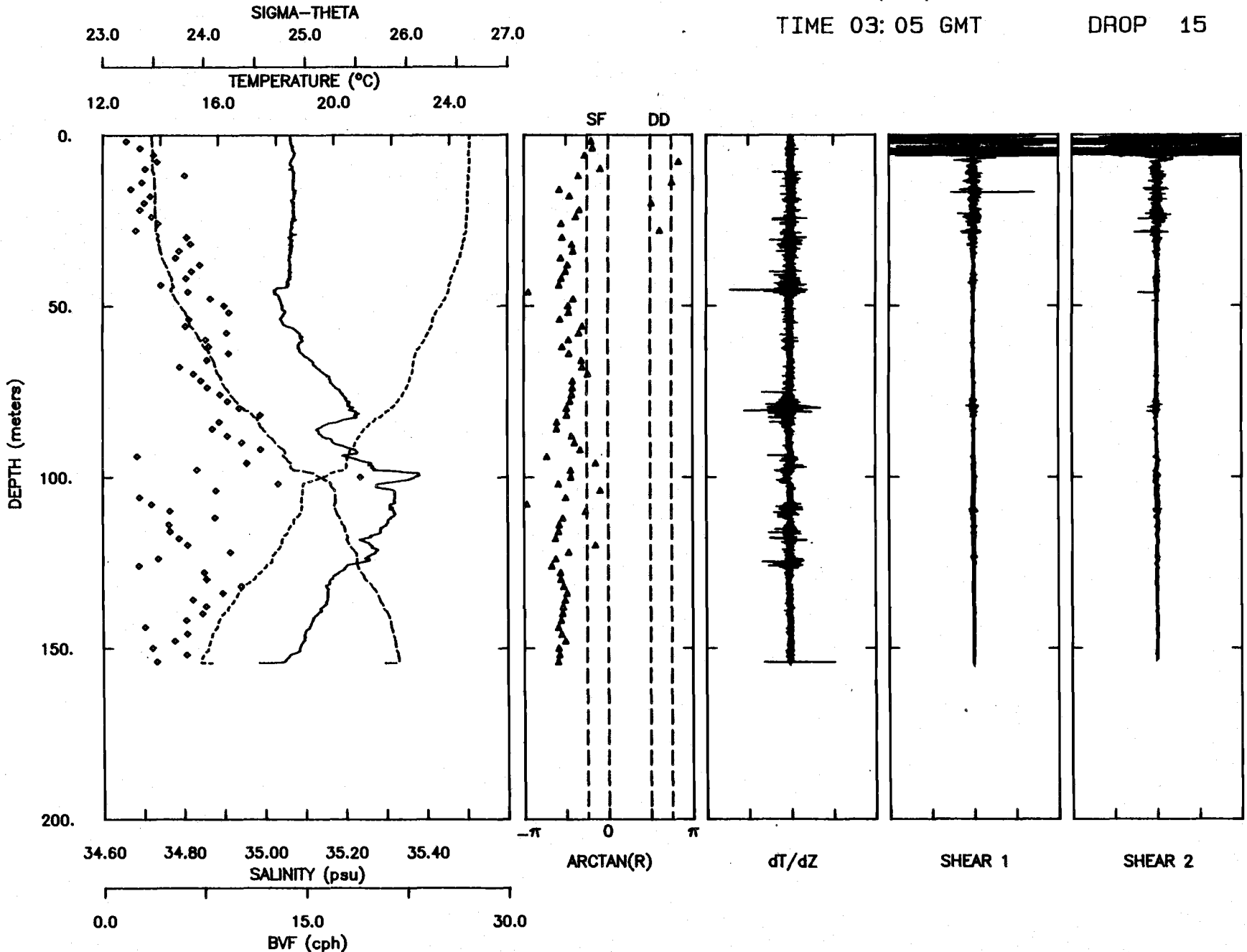
TIME 02:06 GMT

DROP 05



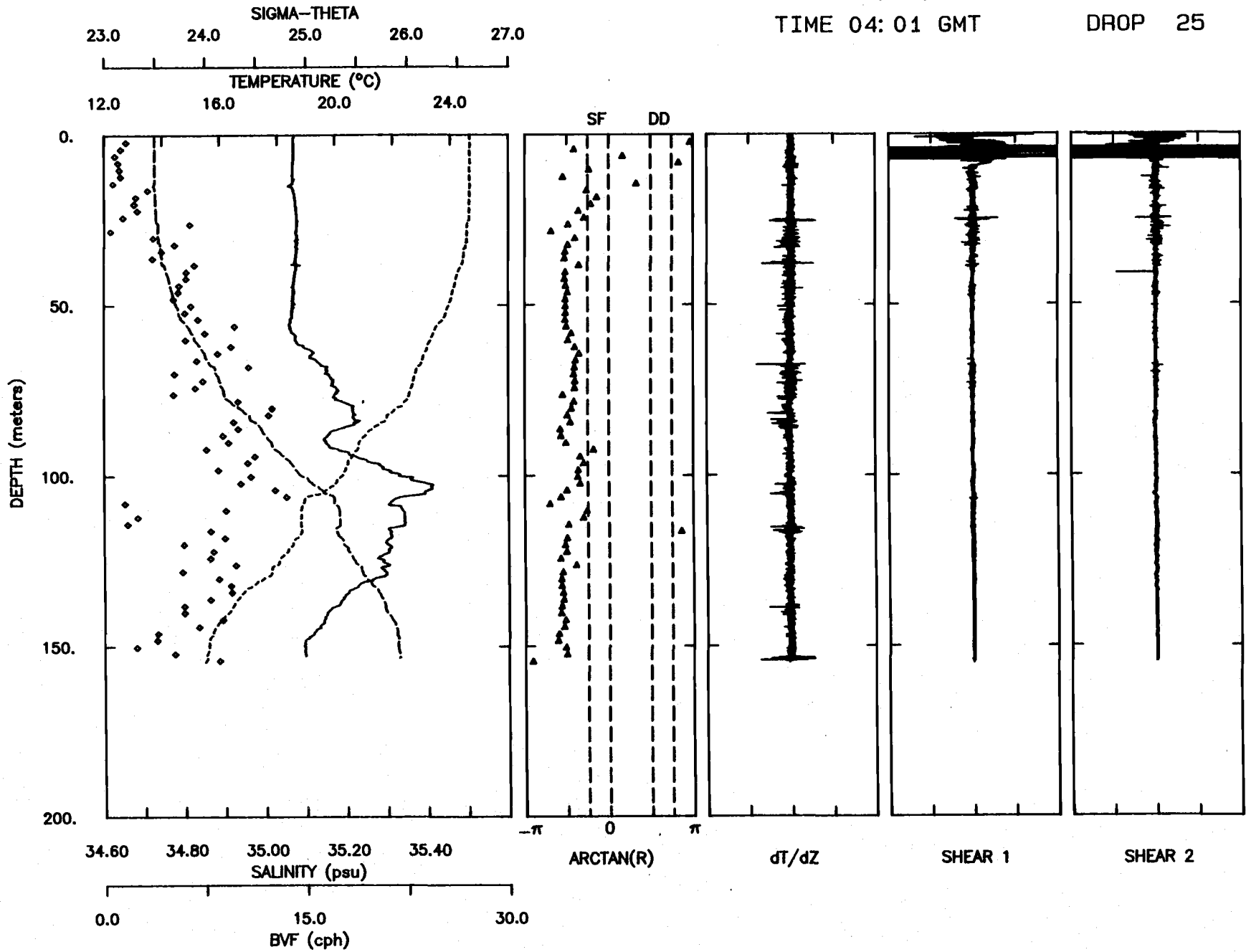
DATE 11/26/84
TIME 03:05 GMT

TAPE 128
DROP 15



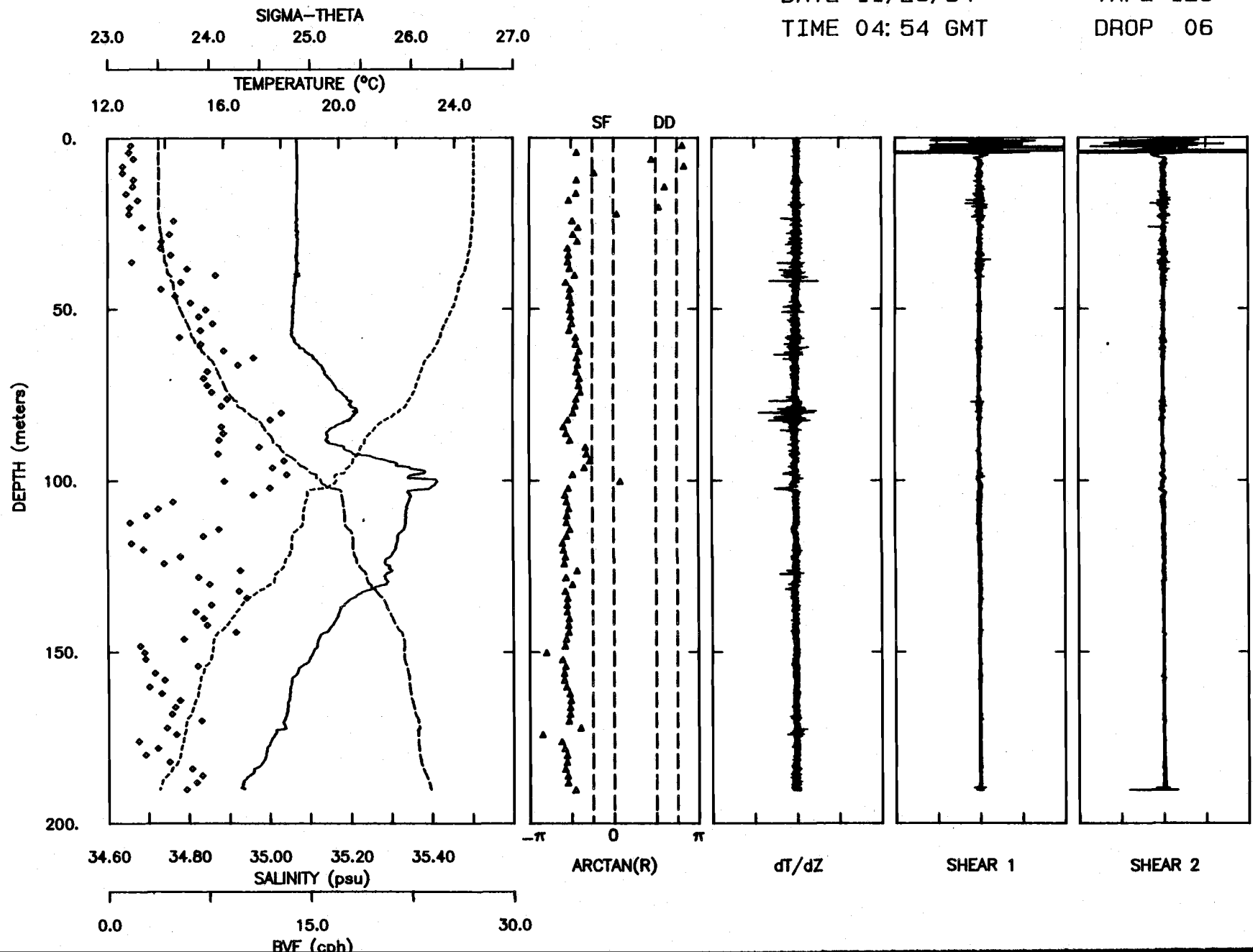
DATE 11/26/84
TIME 04:01 GMT

TAPE 128
DROP 25



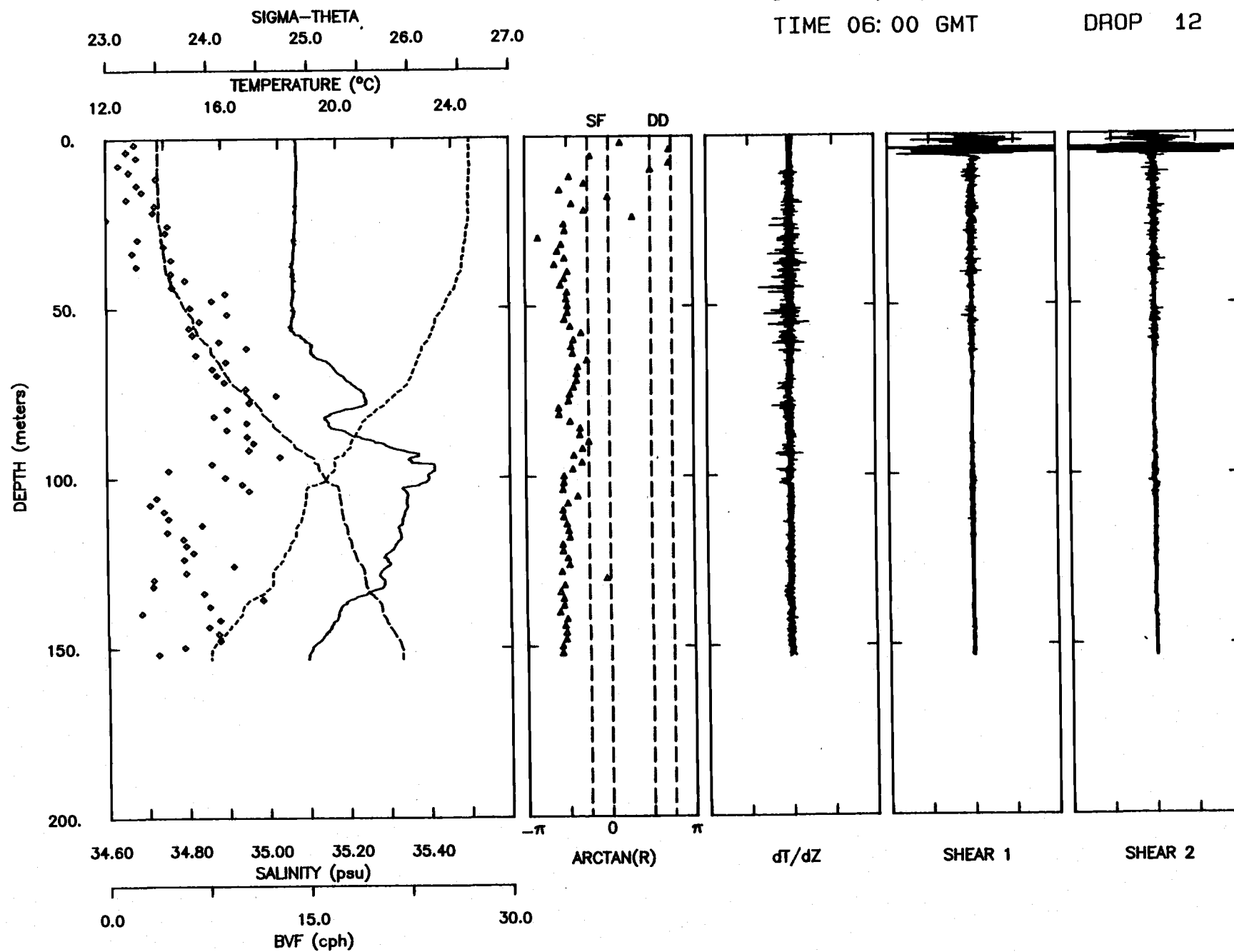
DATE 11/26/84
TIME 04:54 GMT

TAPE 129
DROP 06



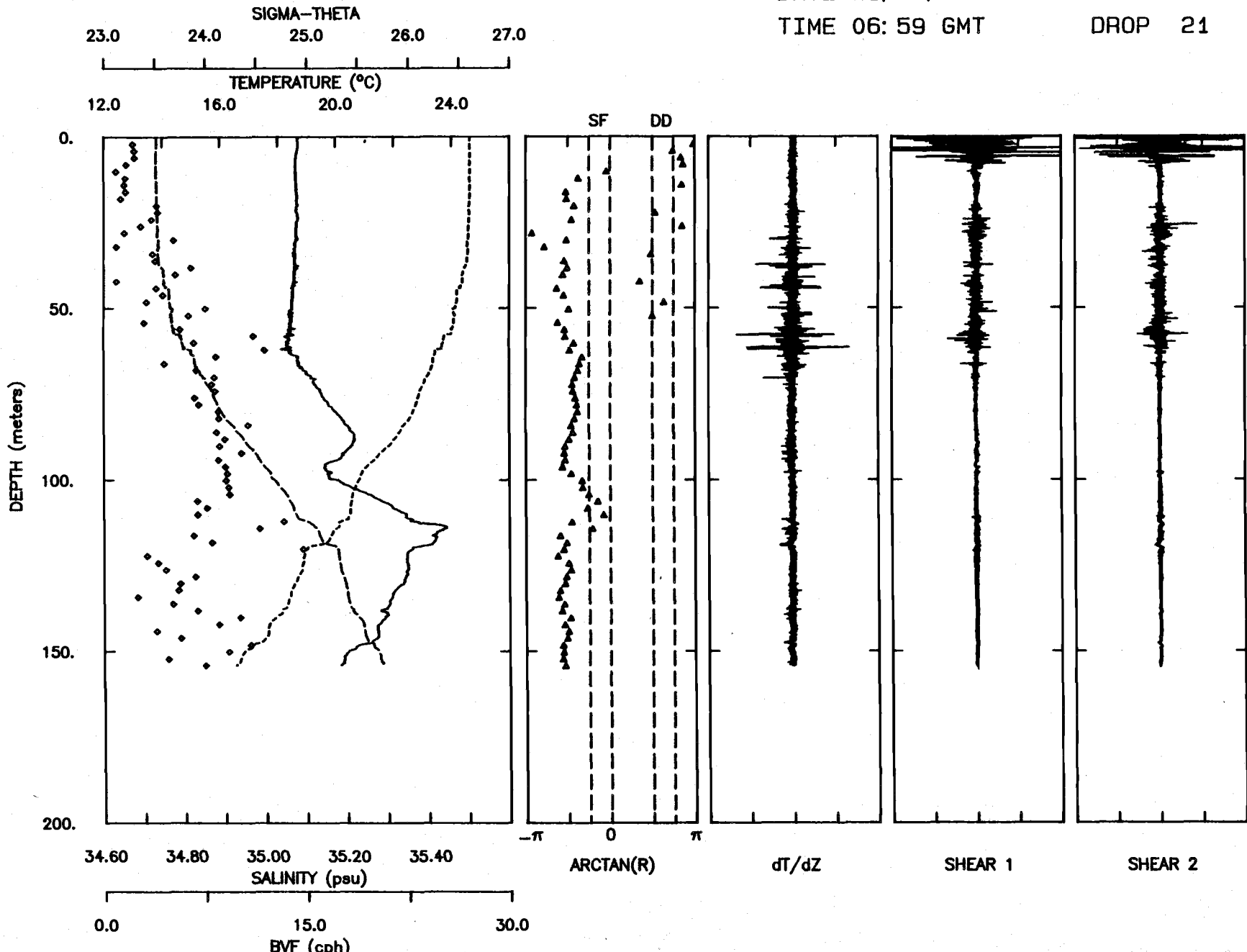
DATE 11/26/84
TIME 06:00 GMT

TAPE 129
DROP 12



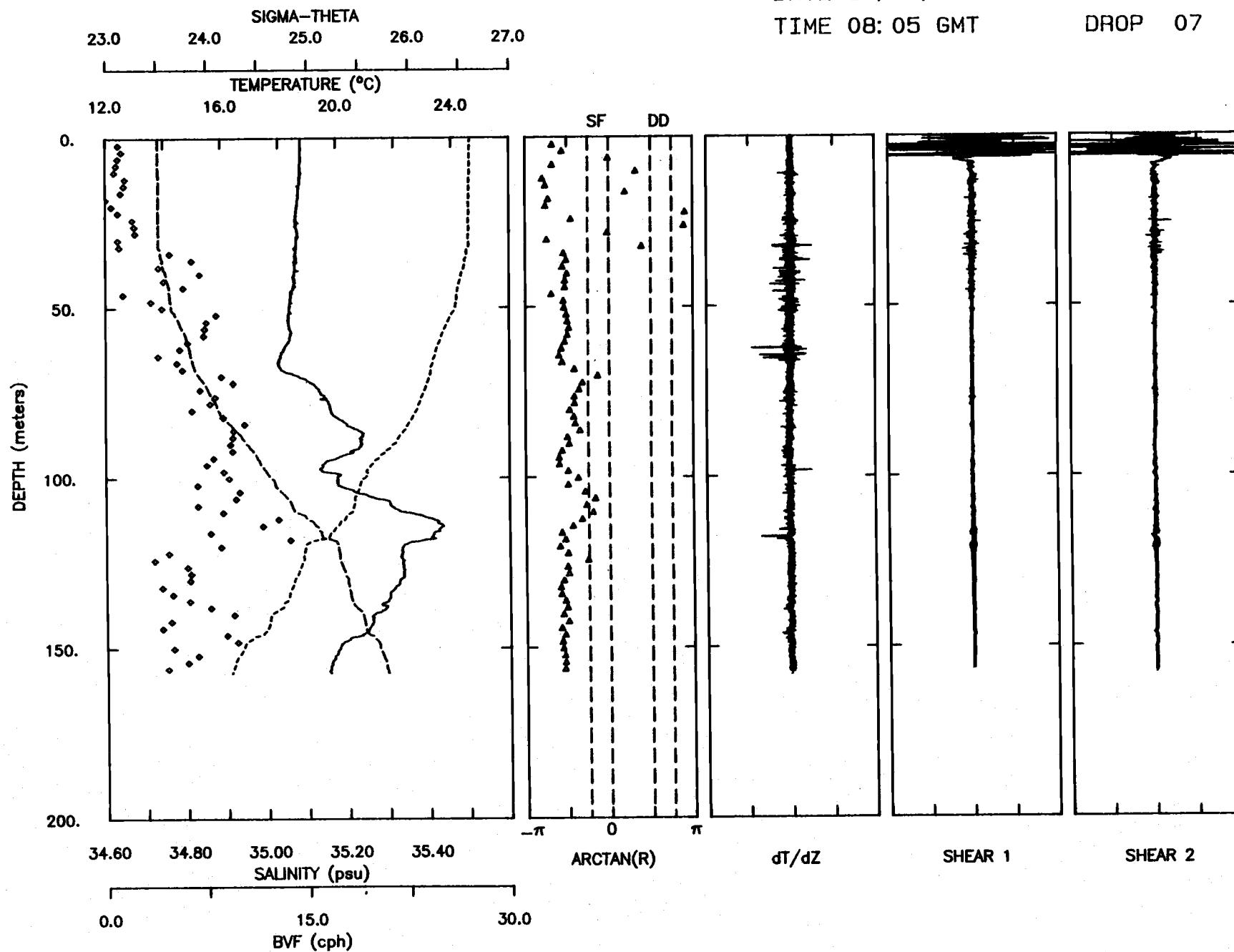
DATE 11/26/84
TIME 06:59 GMT

TAPE 129
DROP 21



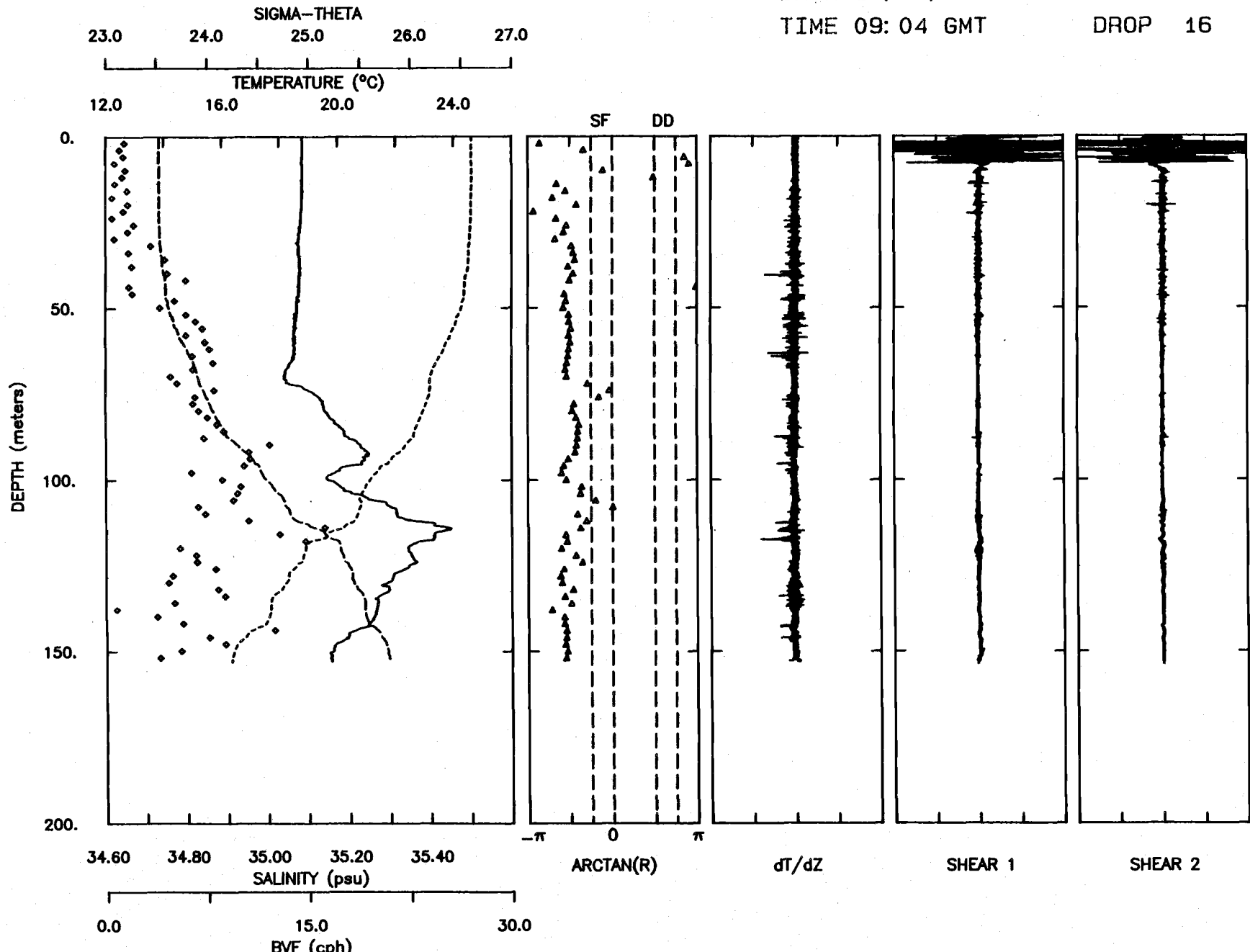
DATE 11/26/84
TIME 08:05 GMT

TAPE 130
DROP 07



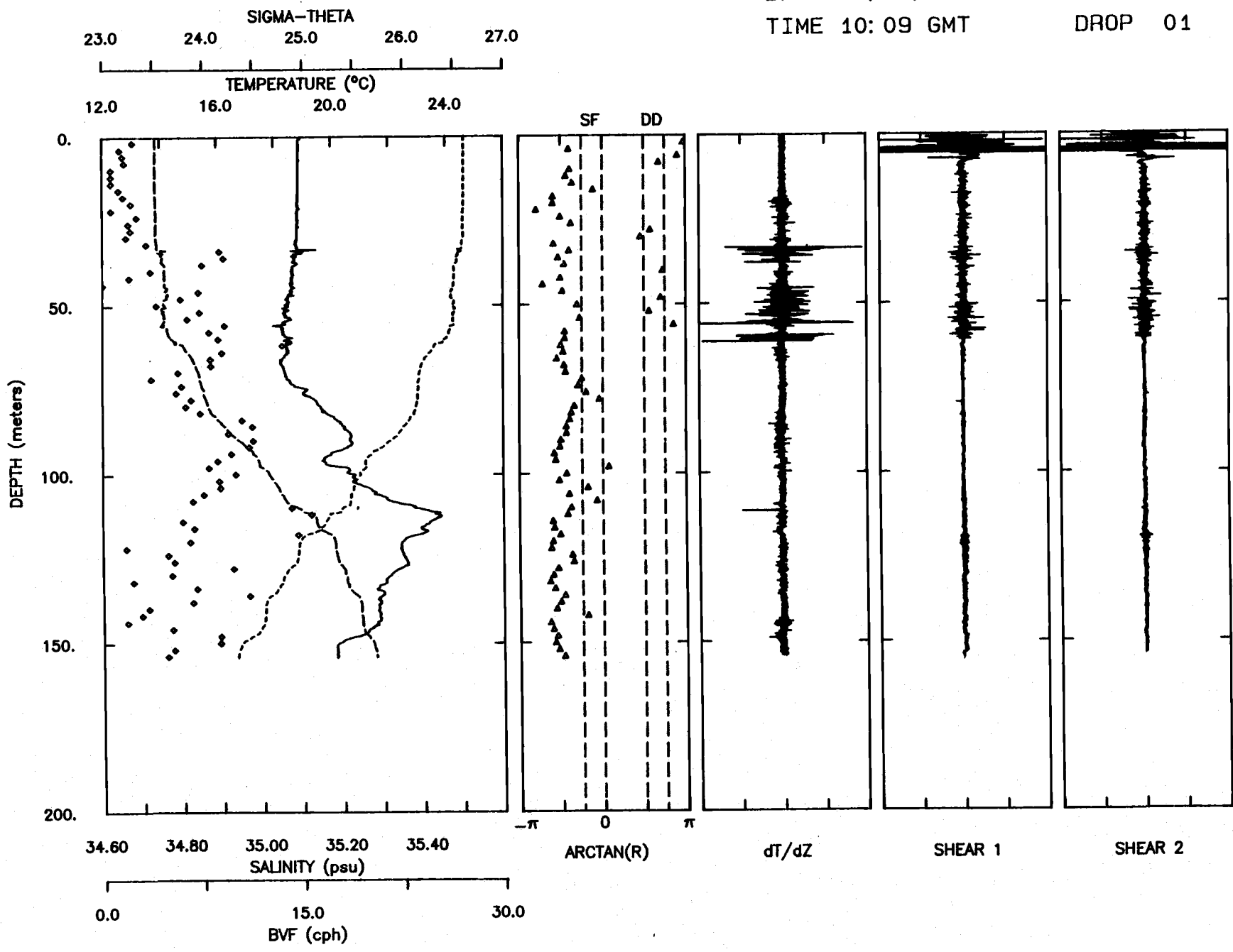
DATE 11/26/84
TIME 09:04 GMT

TAPE 130
DROP 16



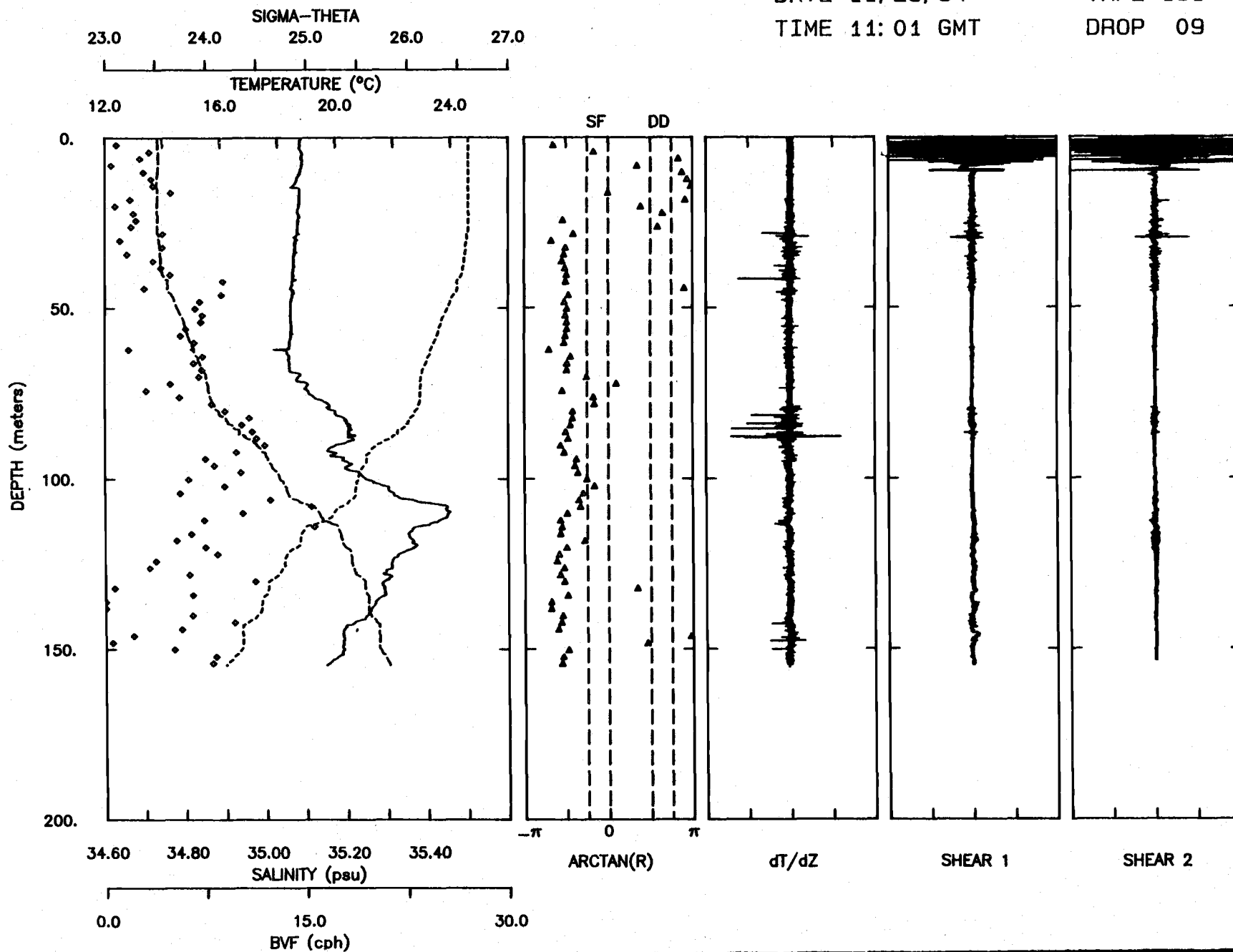
DATE 11/26/84
TIME 10:09 GMT

TAPE 131
DROP 01



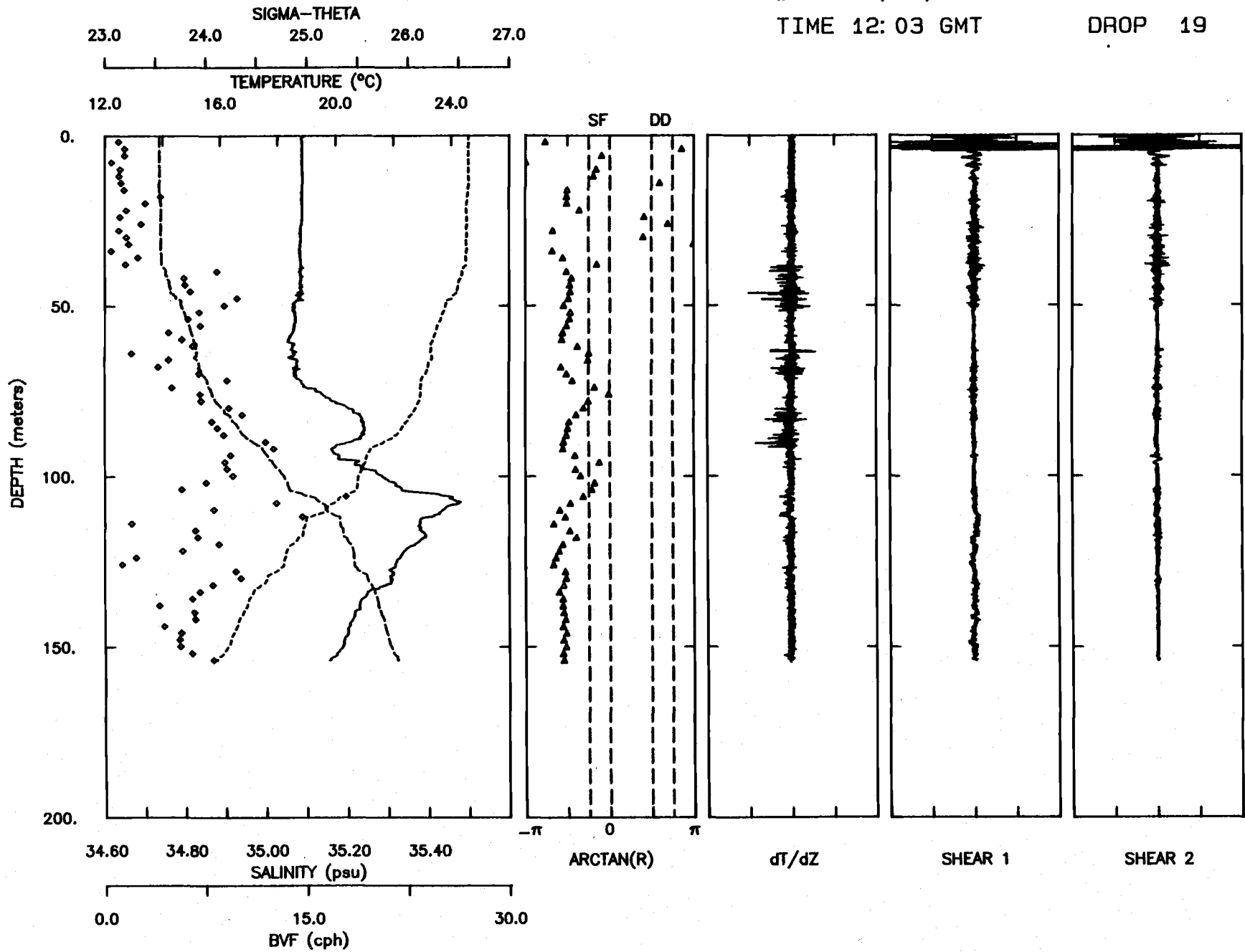
DATE 11/26/84
TIME 11:01 GMT

TAPE 131
DROP 09



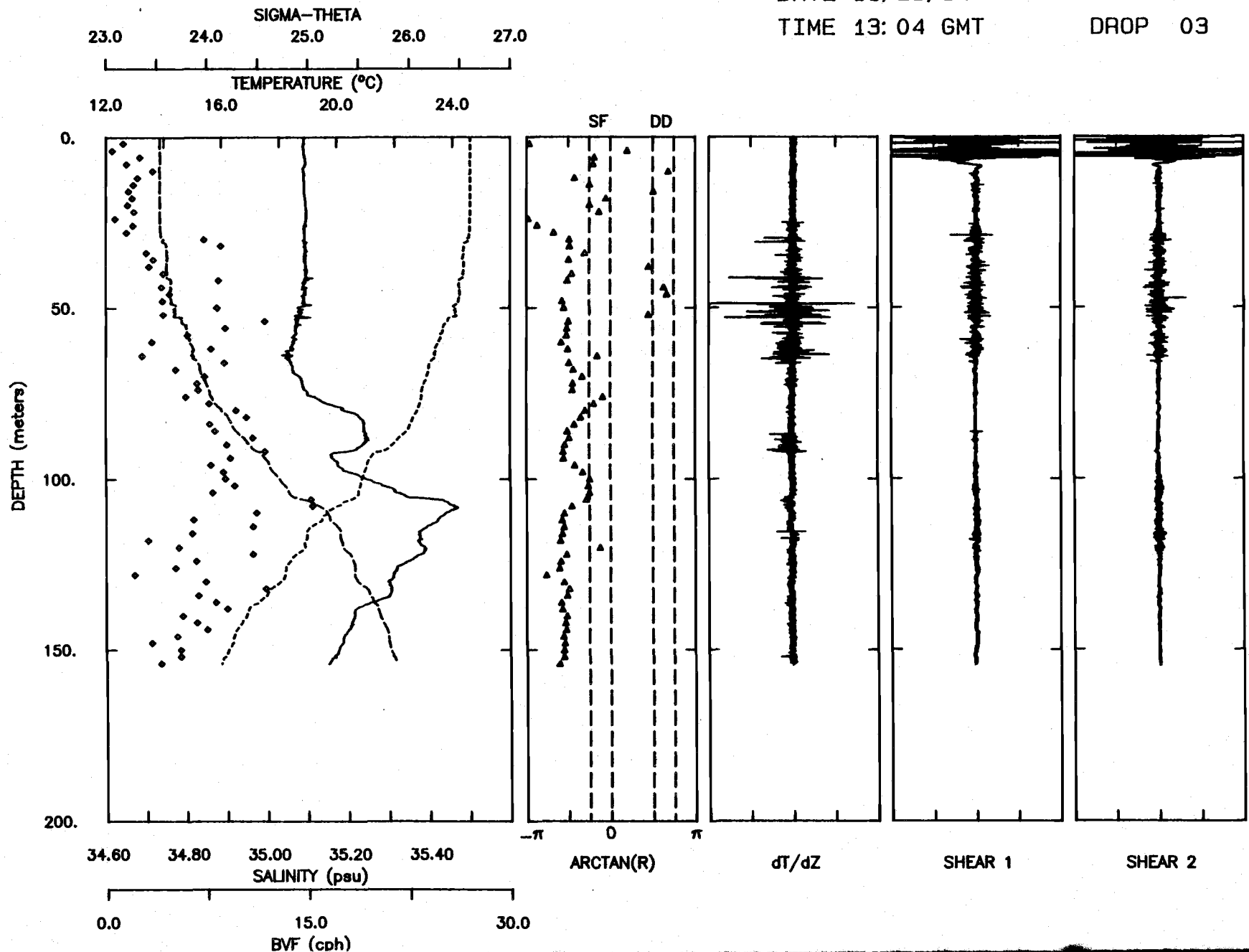
DATE 11/26/84
TIME 12:03 GMT

TAPE 131
DROP 19



DATE 11/25/84
TIME 13:04 GMT

TAPE 132
DROP 03

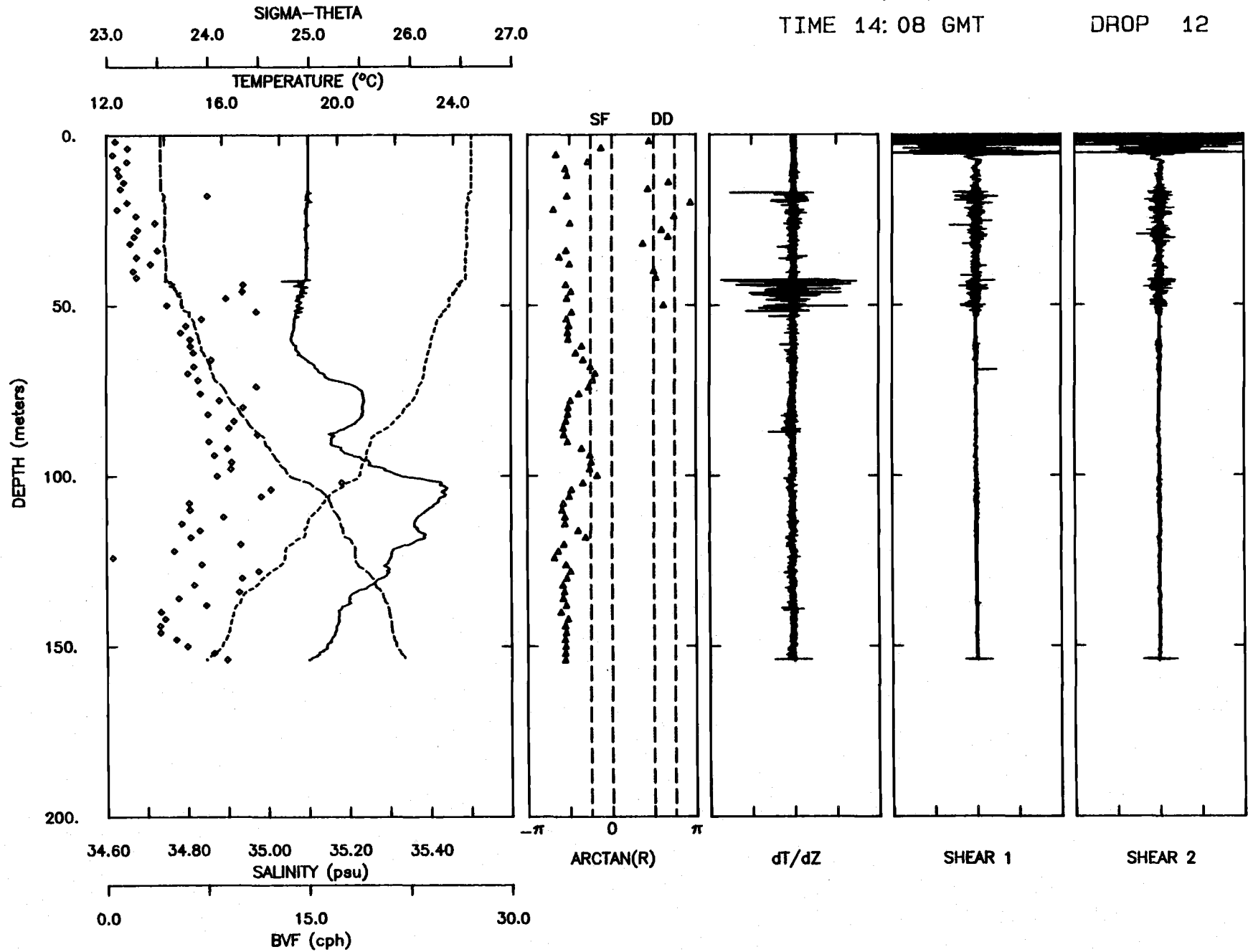


DATE 11/25/84

TAPE 132

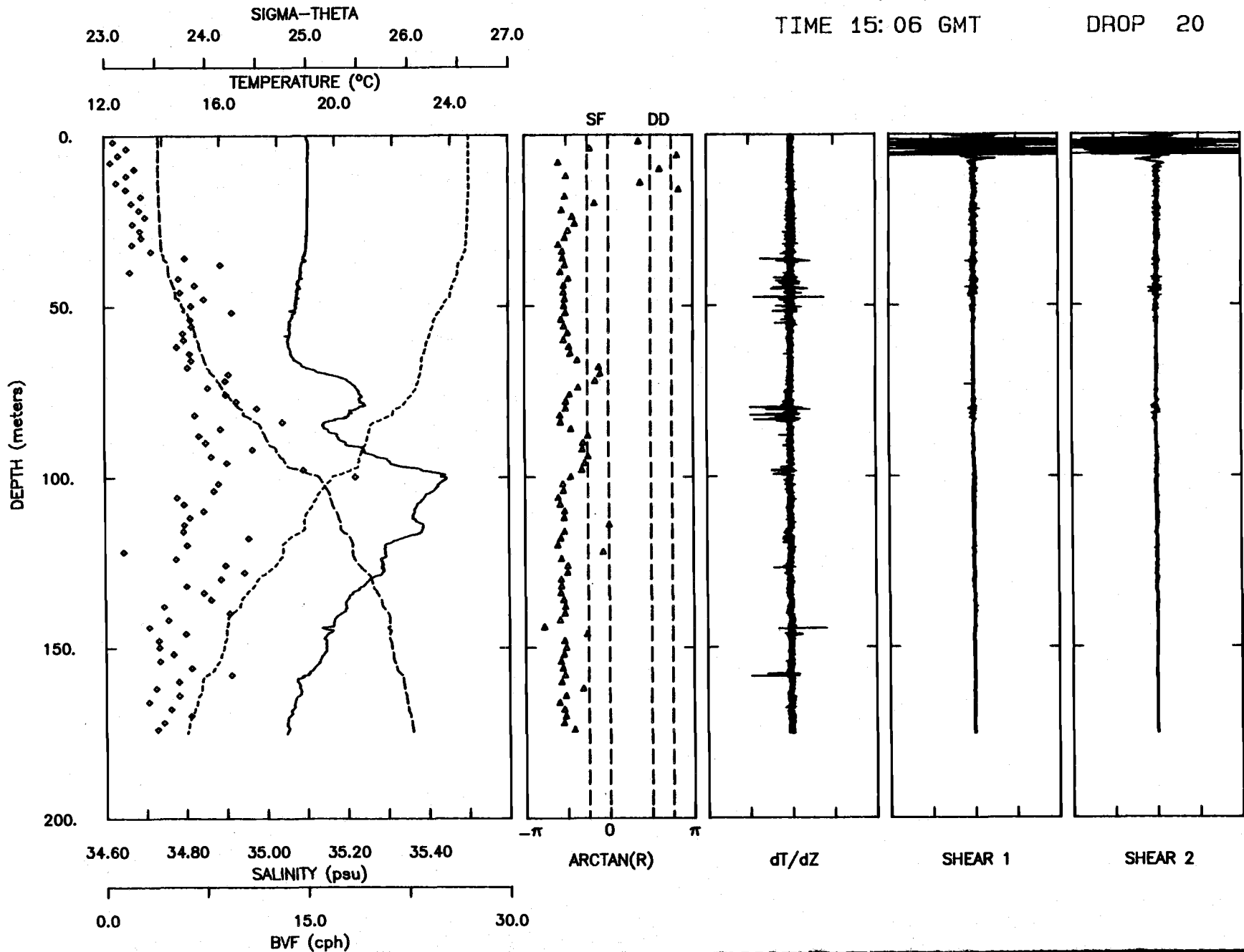
TIME 14:08 GMT

DROP 12



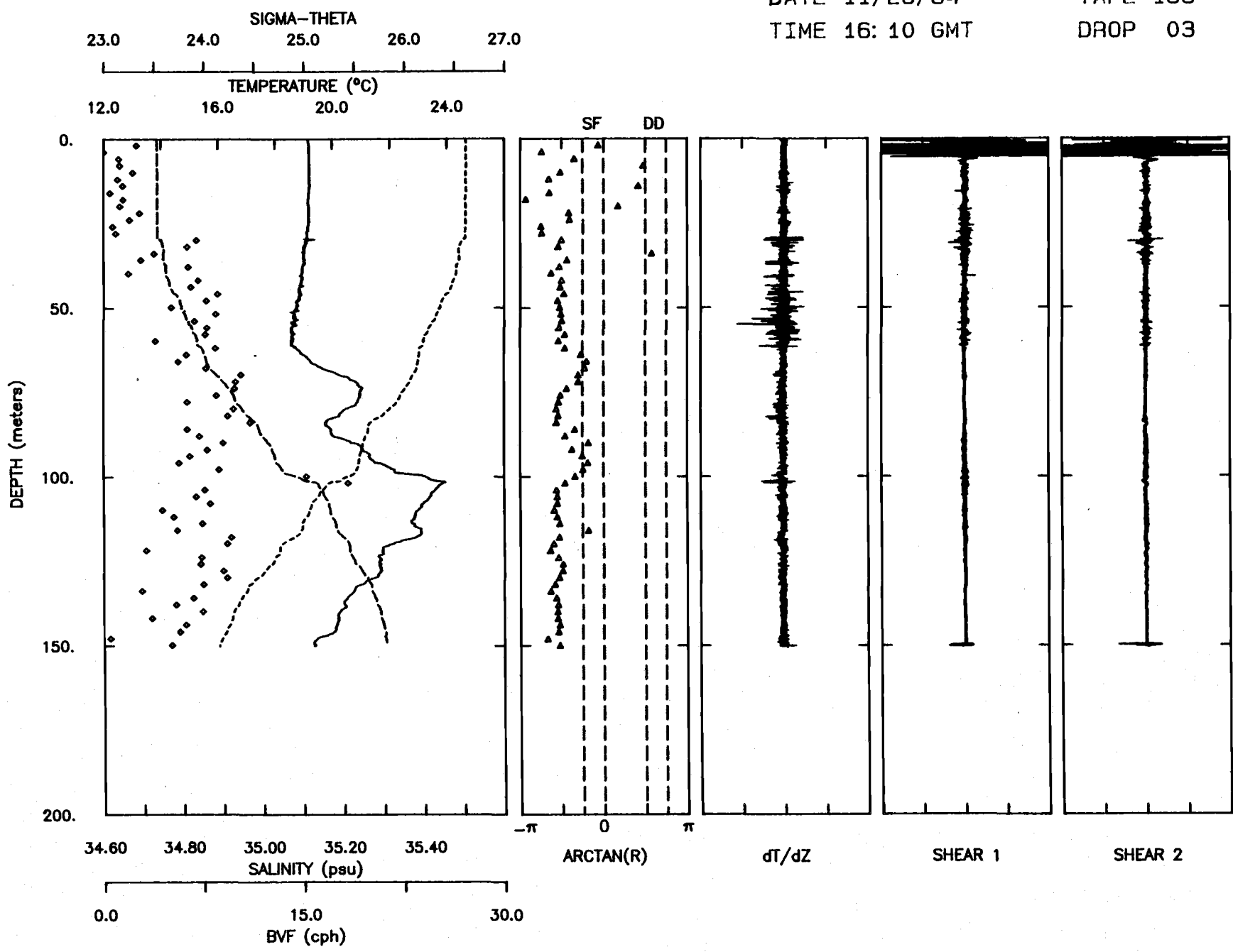
DATE 11/25/84
TIME 15:06 GMT

TAPE 132
DROP 20



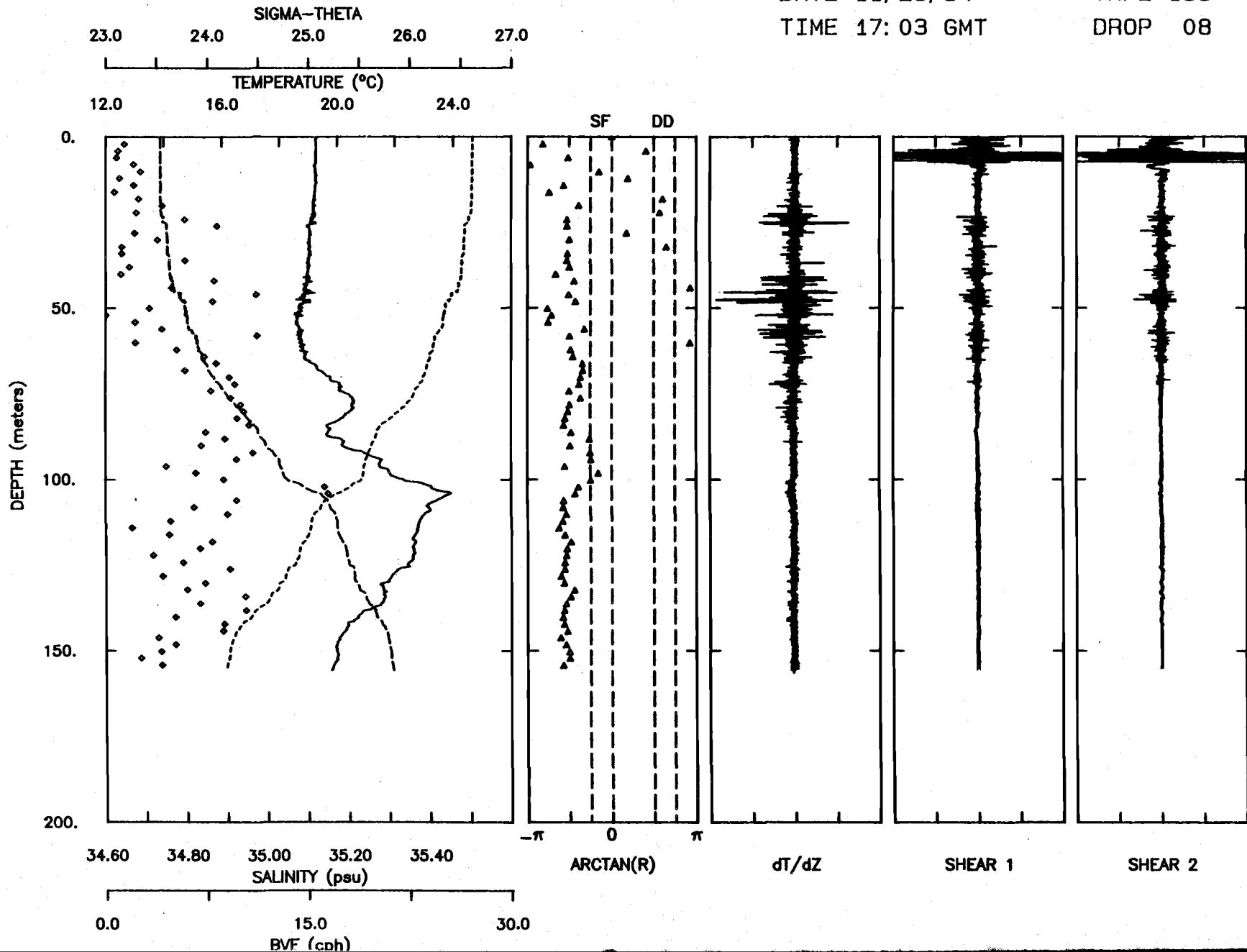
DATE 11/26/84
TIME 16:10 GMT

TAPE 133
DROP 03



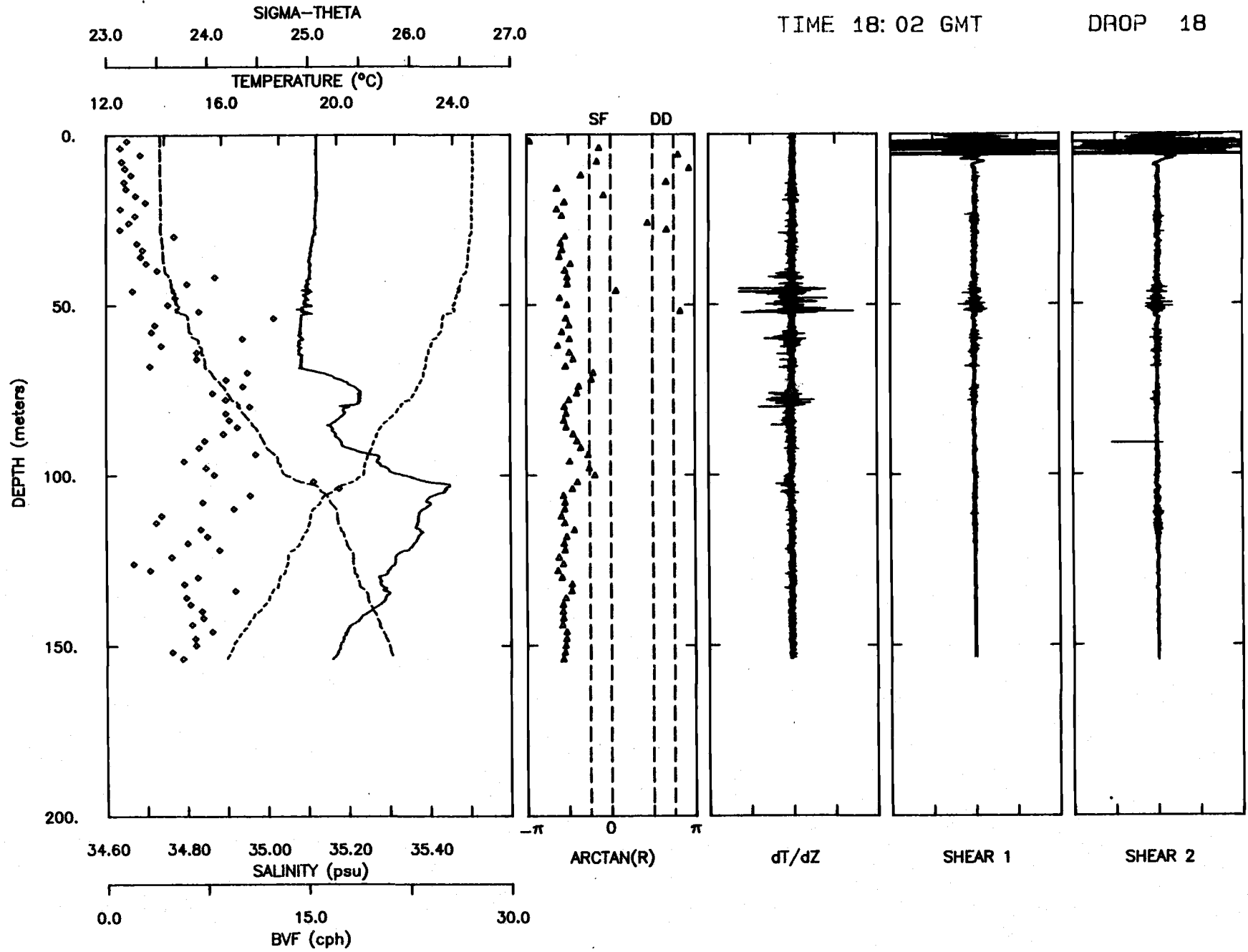
DATE 11/26/84
TIME 17:03 GMT

TAPE 133
DROP 08



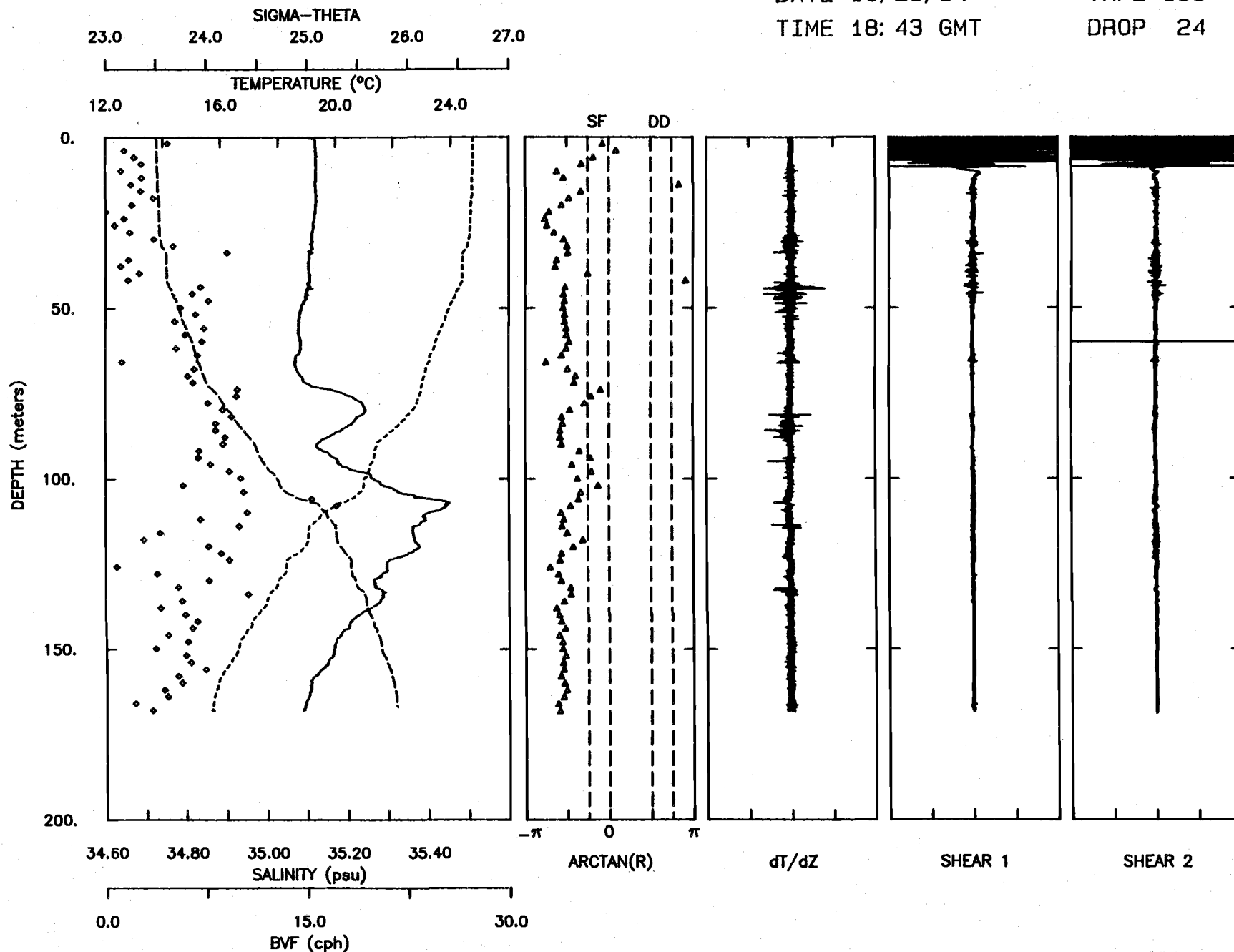
DATE 11/26/84
TIME 18:02 GMT

TAPE 133
DROP 18



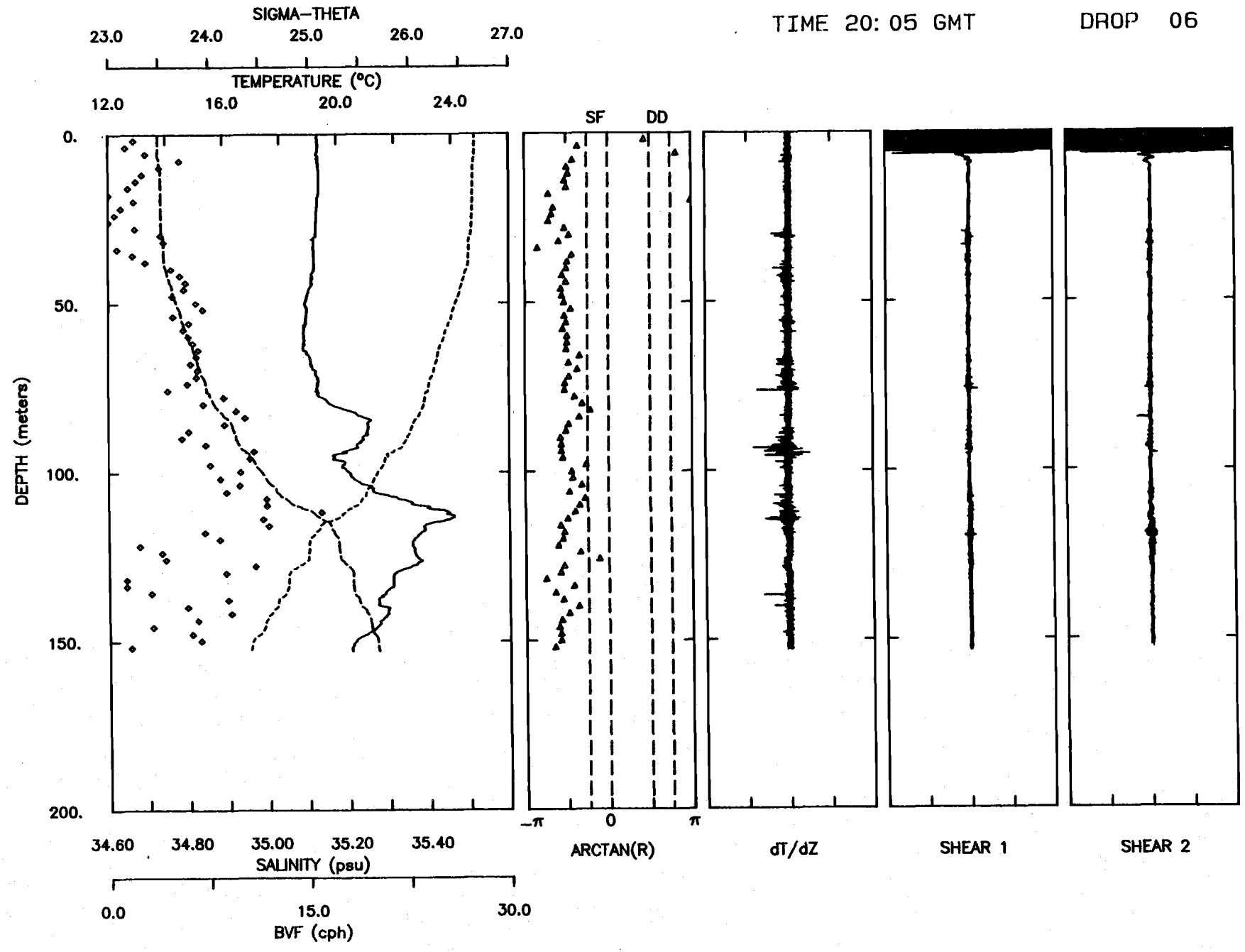
DATE 11/26/84
TIME 18:43 GMT

TAPE 133
DROP 24



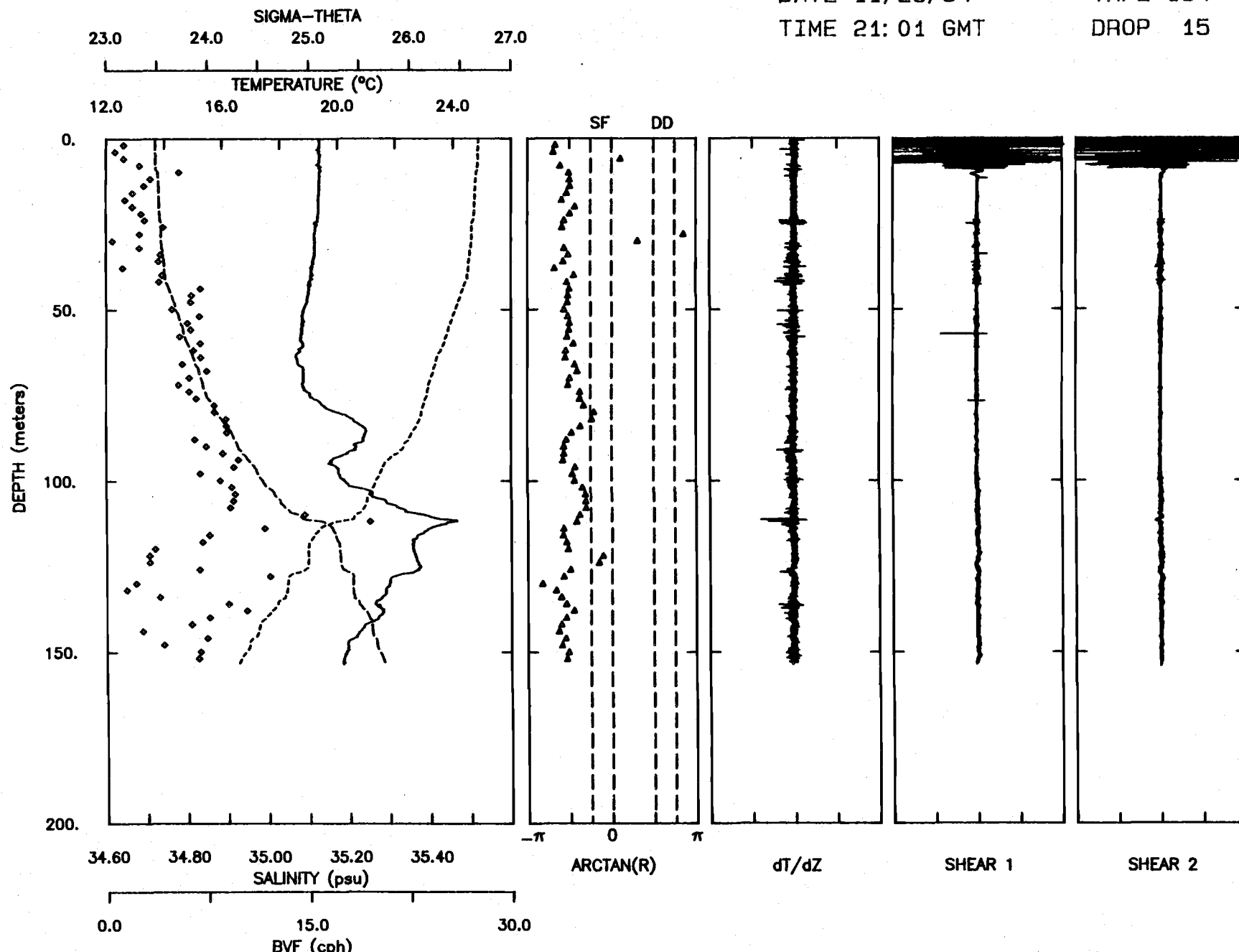
DATE 11/26/84
TIME 20:05 GMT

TAPE 134
DROP 06



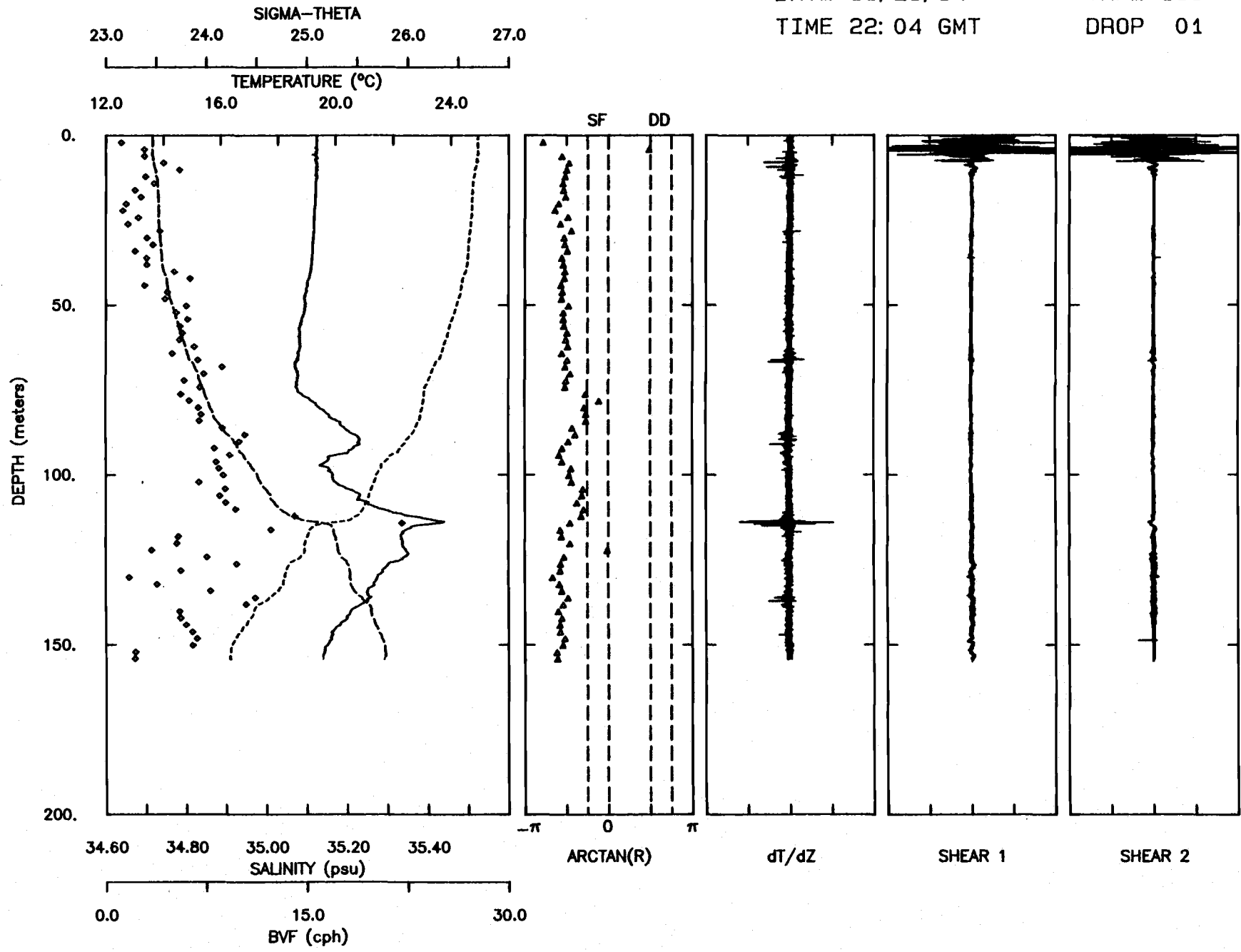
DATE 11/26/84
TIME 21:01 GMT

TAPE 134
DROP 15



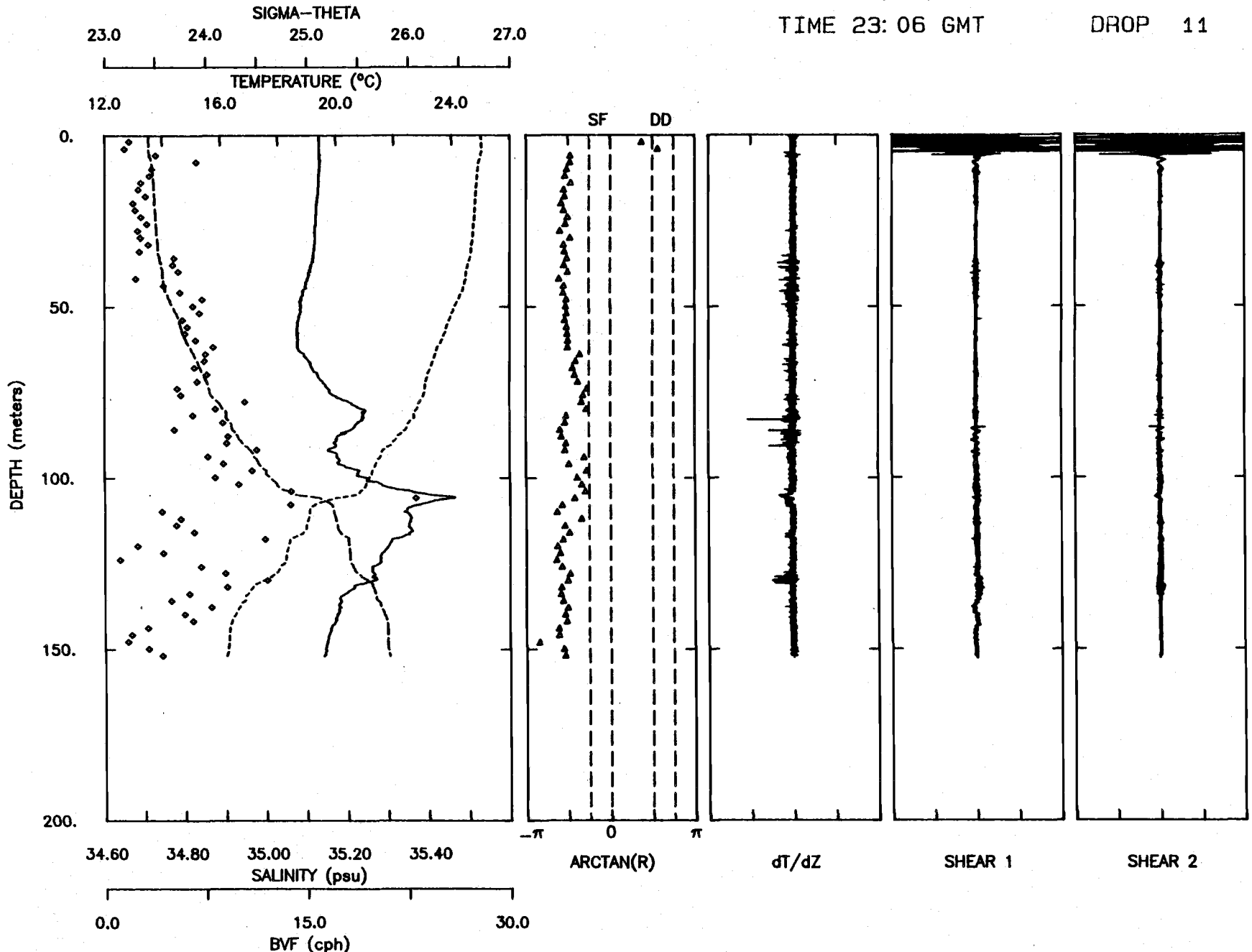
DATE 11/26/84
TIME 22:04 GMT

TAPE 135
DROP 01



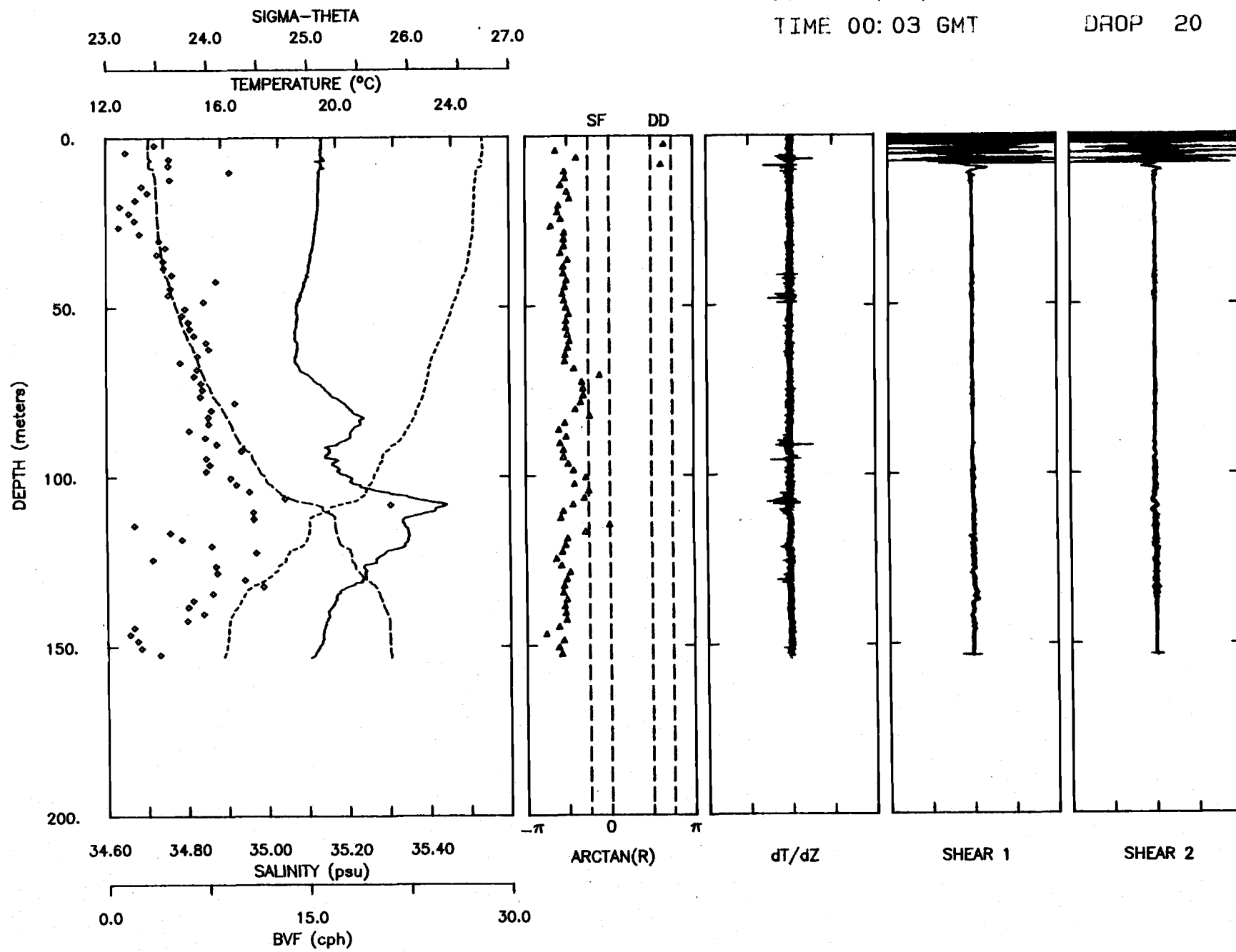
DATE 11/26/84
TIME 23:06 GMT

TAPE 135
DROP 11



DATE 11/27/84
TIME 00:03 GMT

TAPE 135
DROP 20

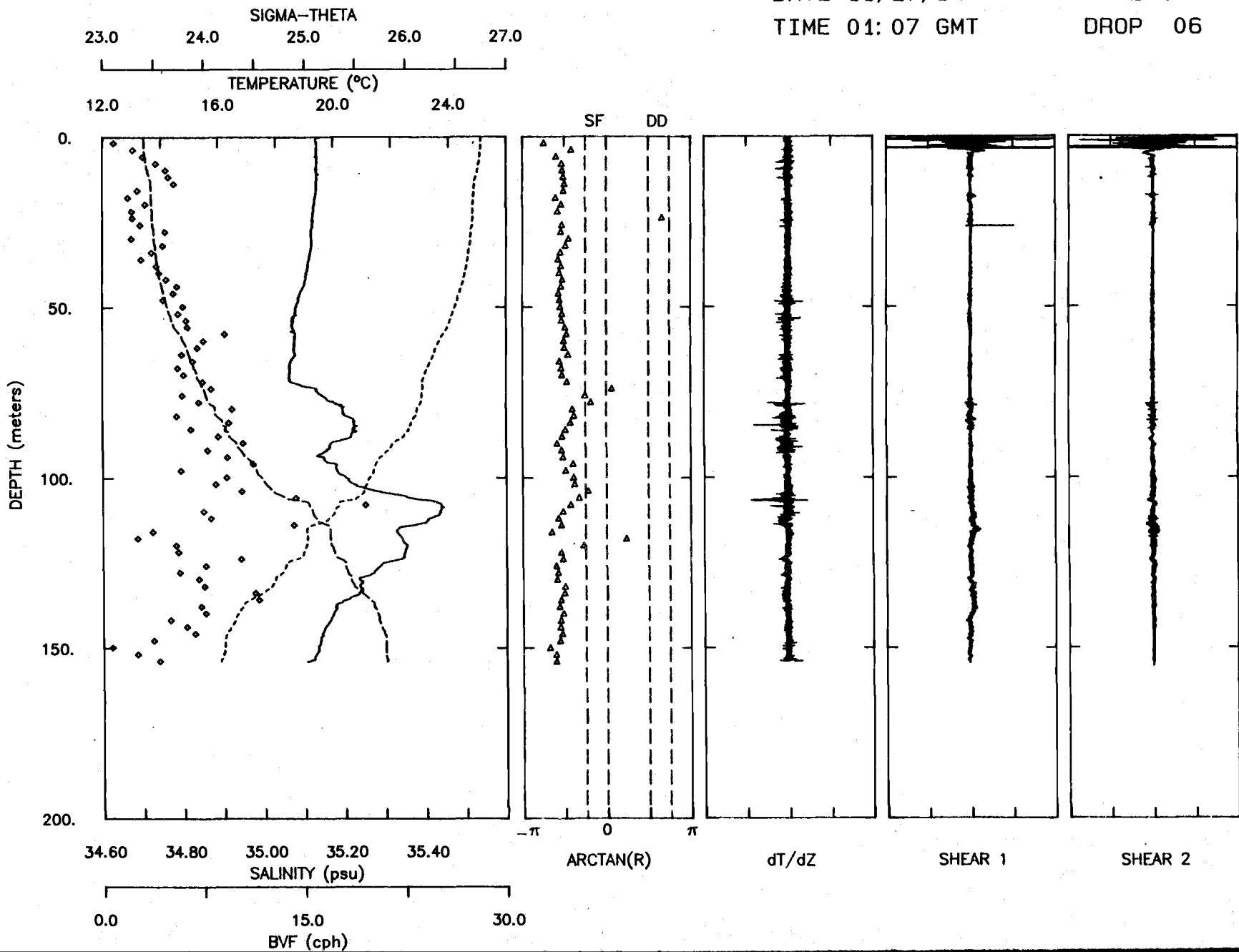


DATE 11/27/84

TAPE 136

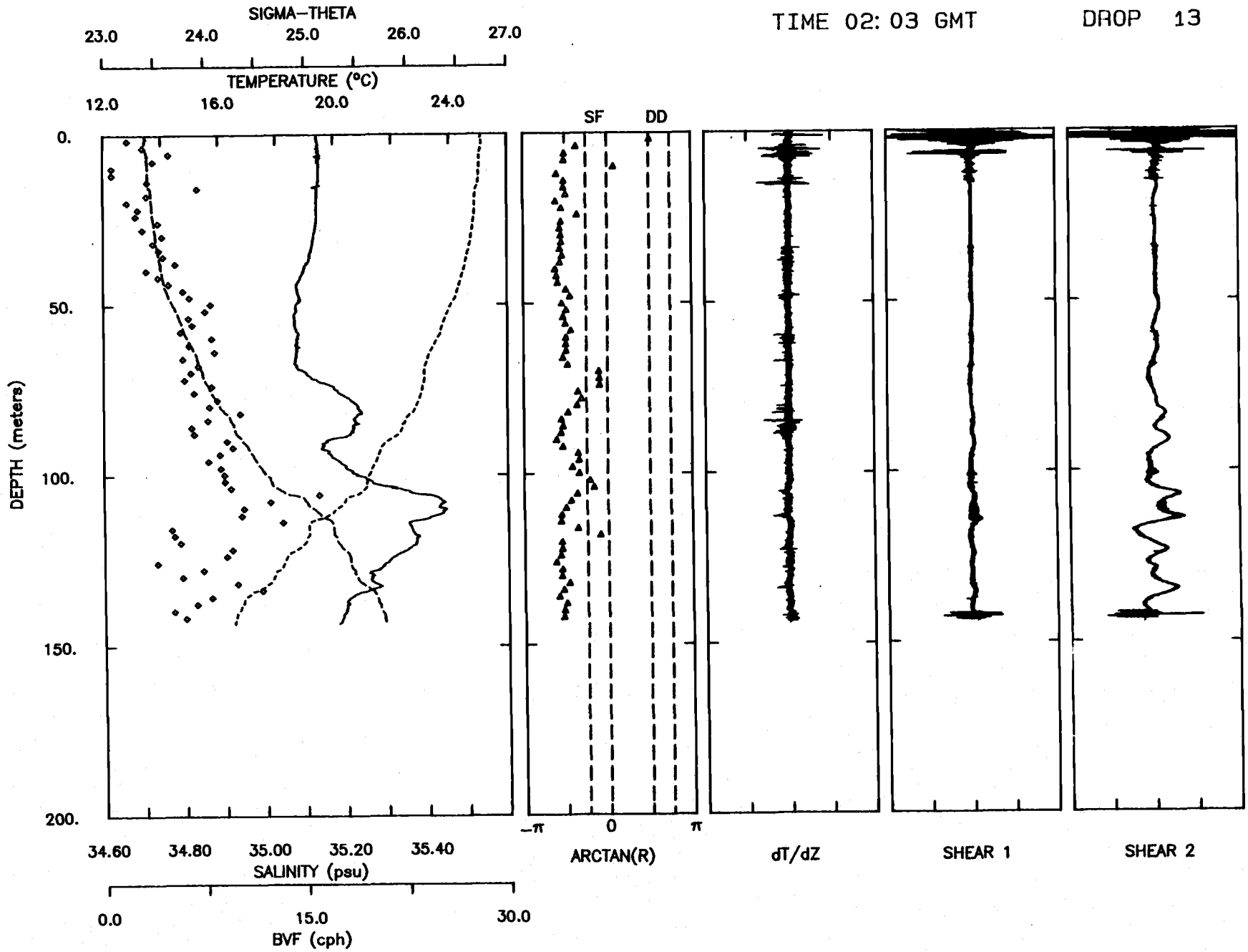
TIME 01:07 GMT

DROP 06



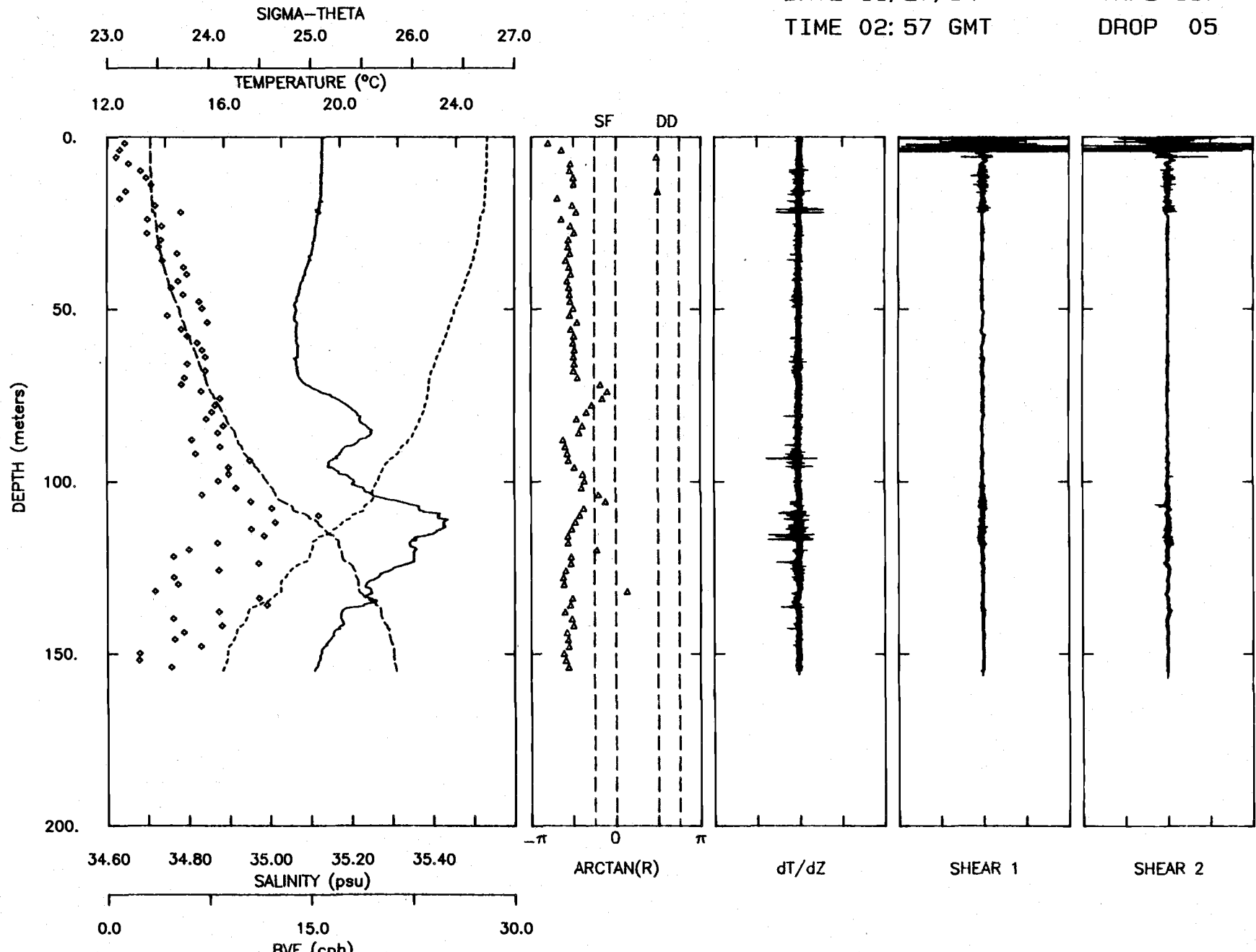
DATE 11/27/84
TIME 02:03 GMT

TAPE 136
DROP 13



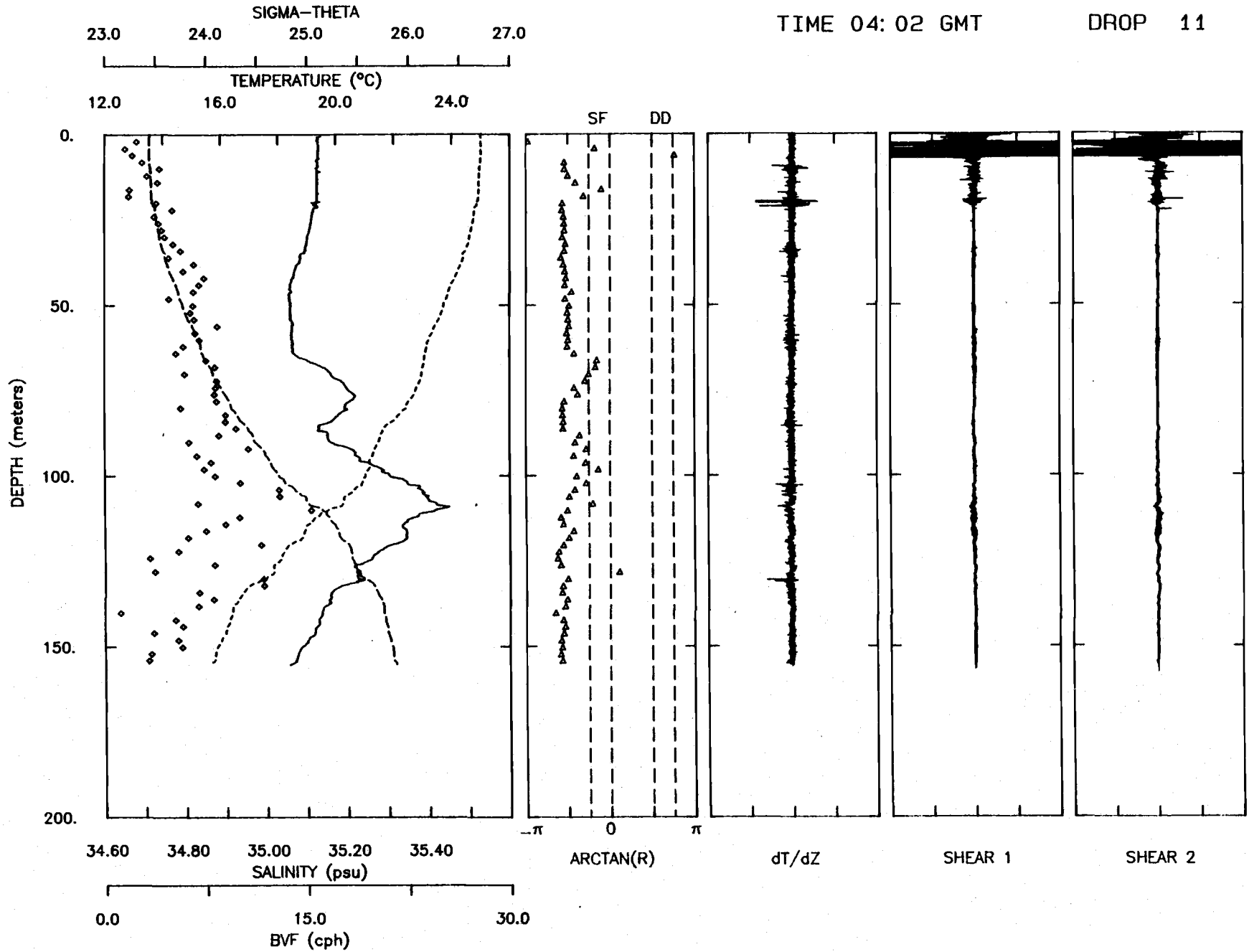
DATE 11/27/84
TIME 02:57 GMT

TAPE 137
DROP 05



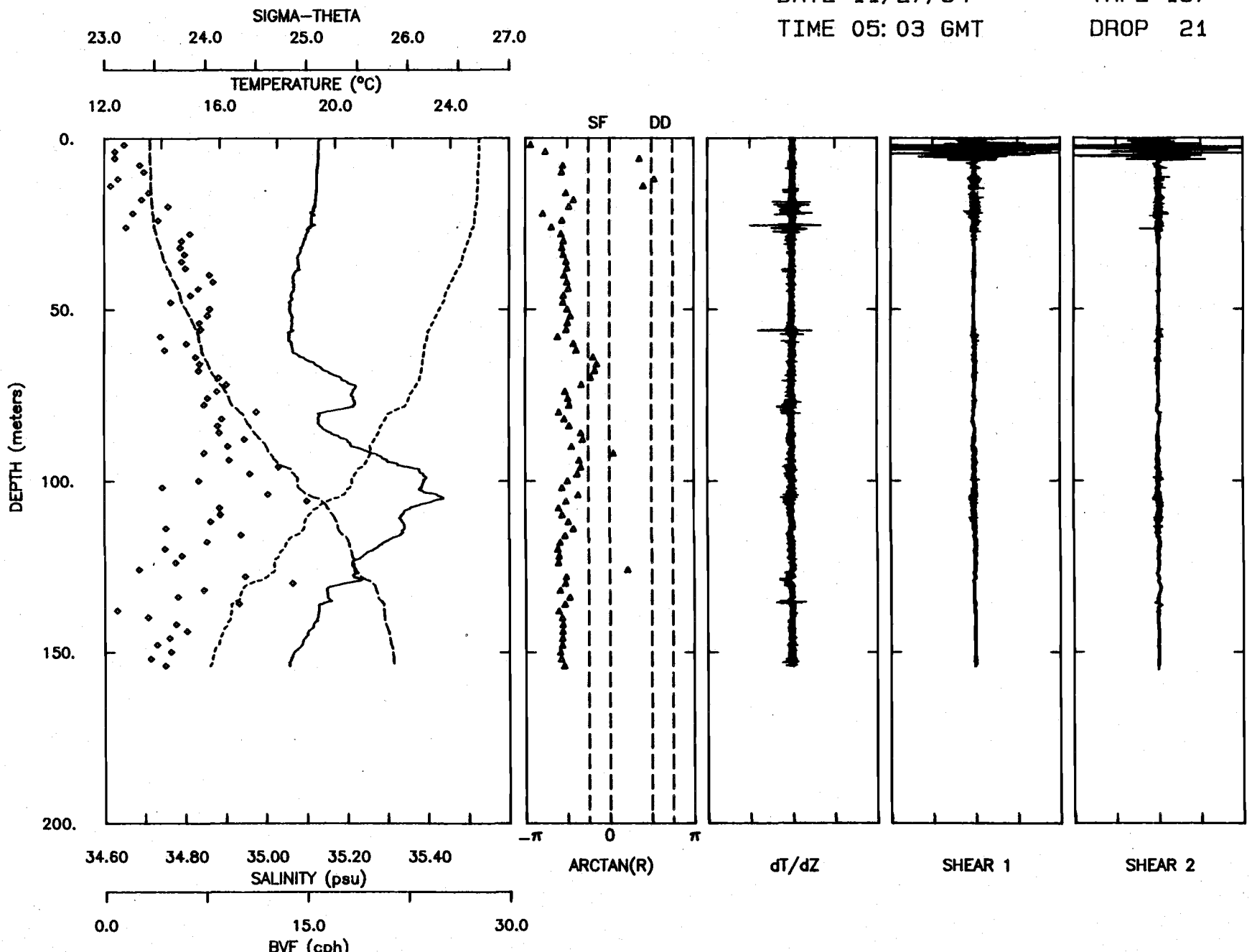
DATE 11/27/84
TIME 04:02 GMT

TAPE 137
DROP 11



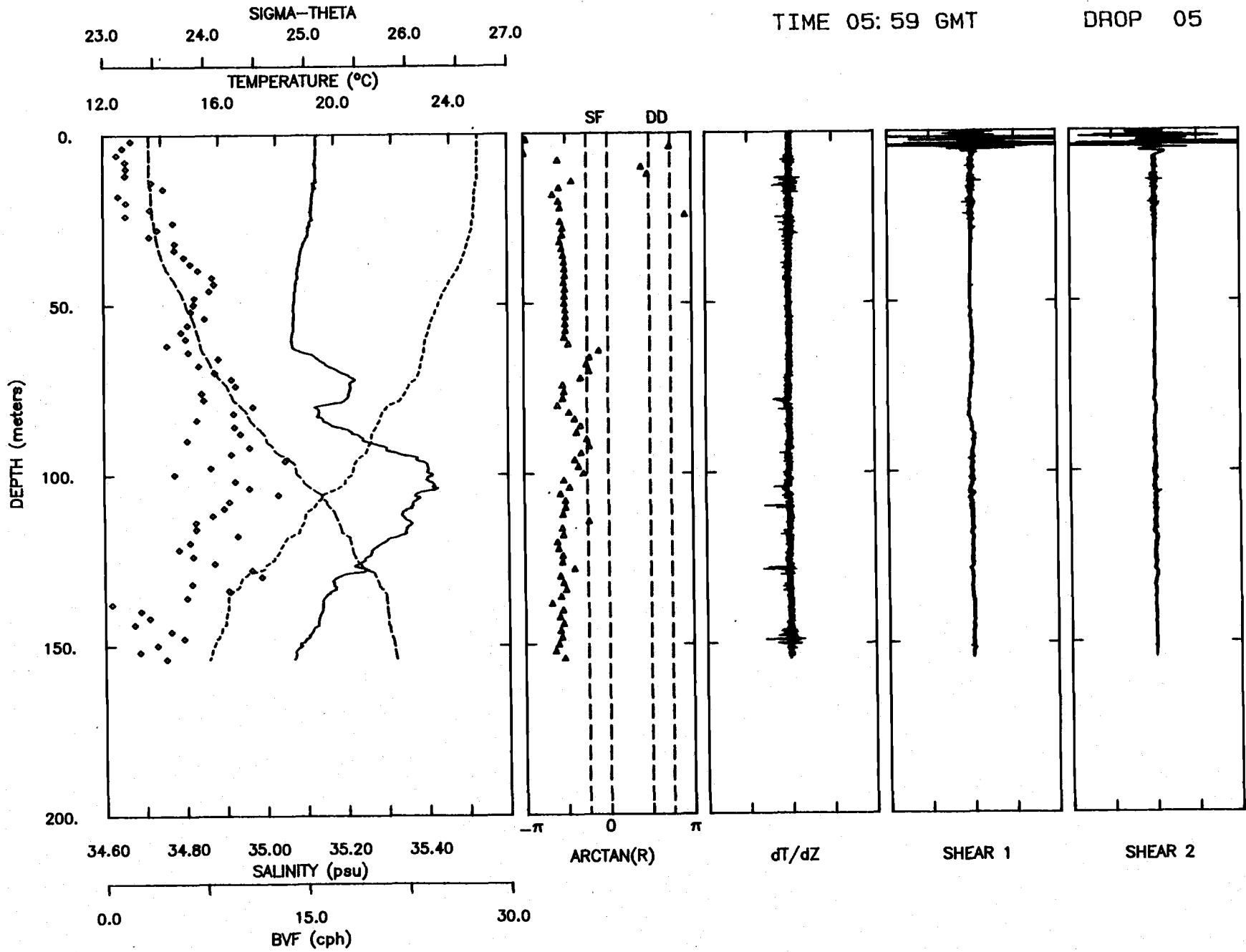
DATE 11/27/84
TIME 05:03 GMT

TAPE 137
DROP 21



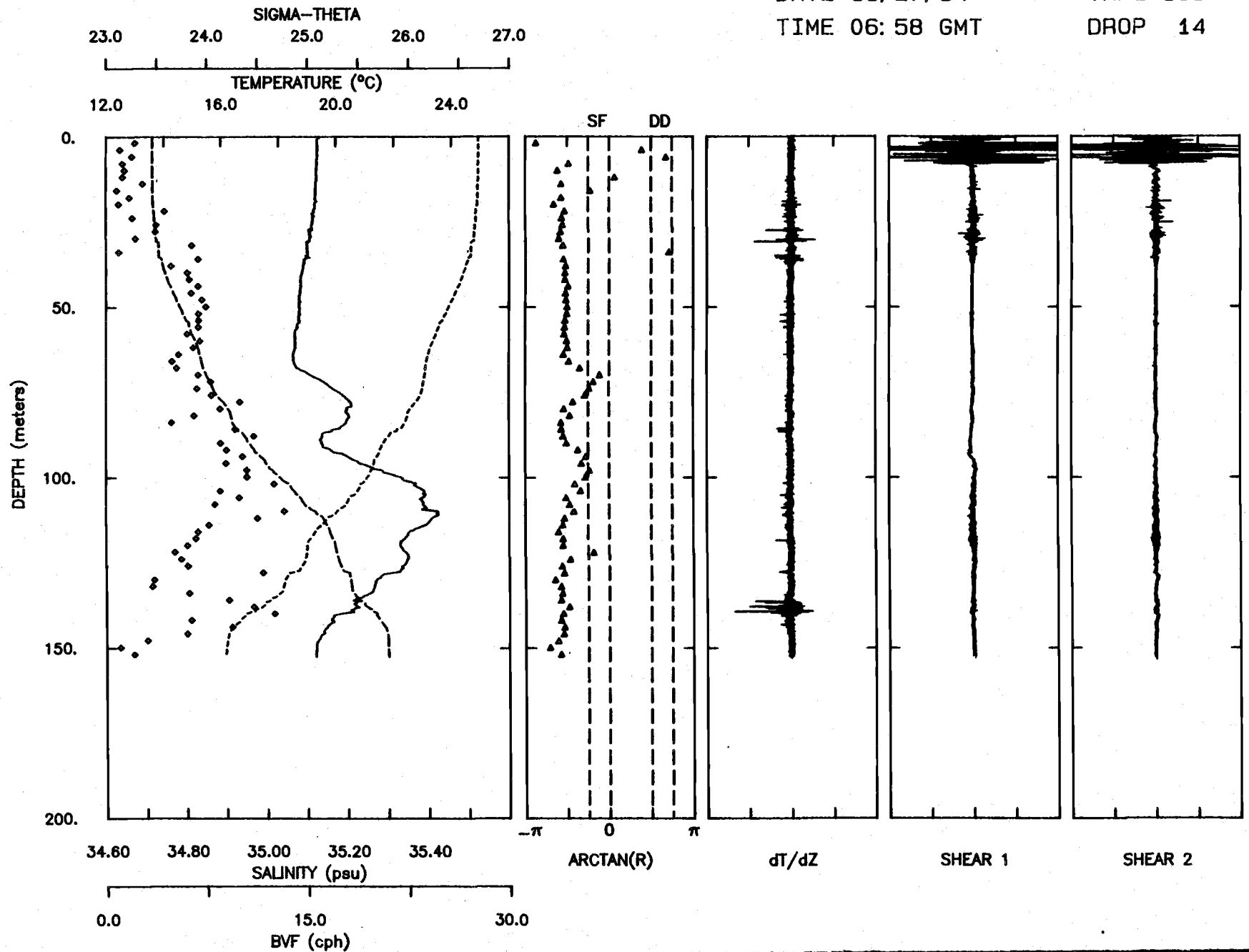
DATE 11/27/84
TIME 05:59 GMT

TAPE 138
DROP 05



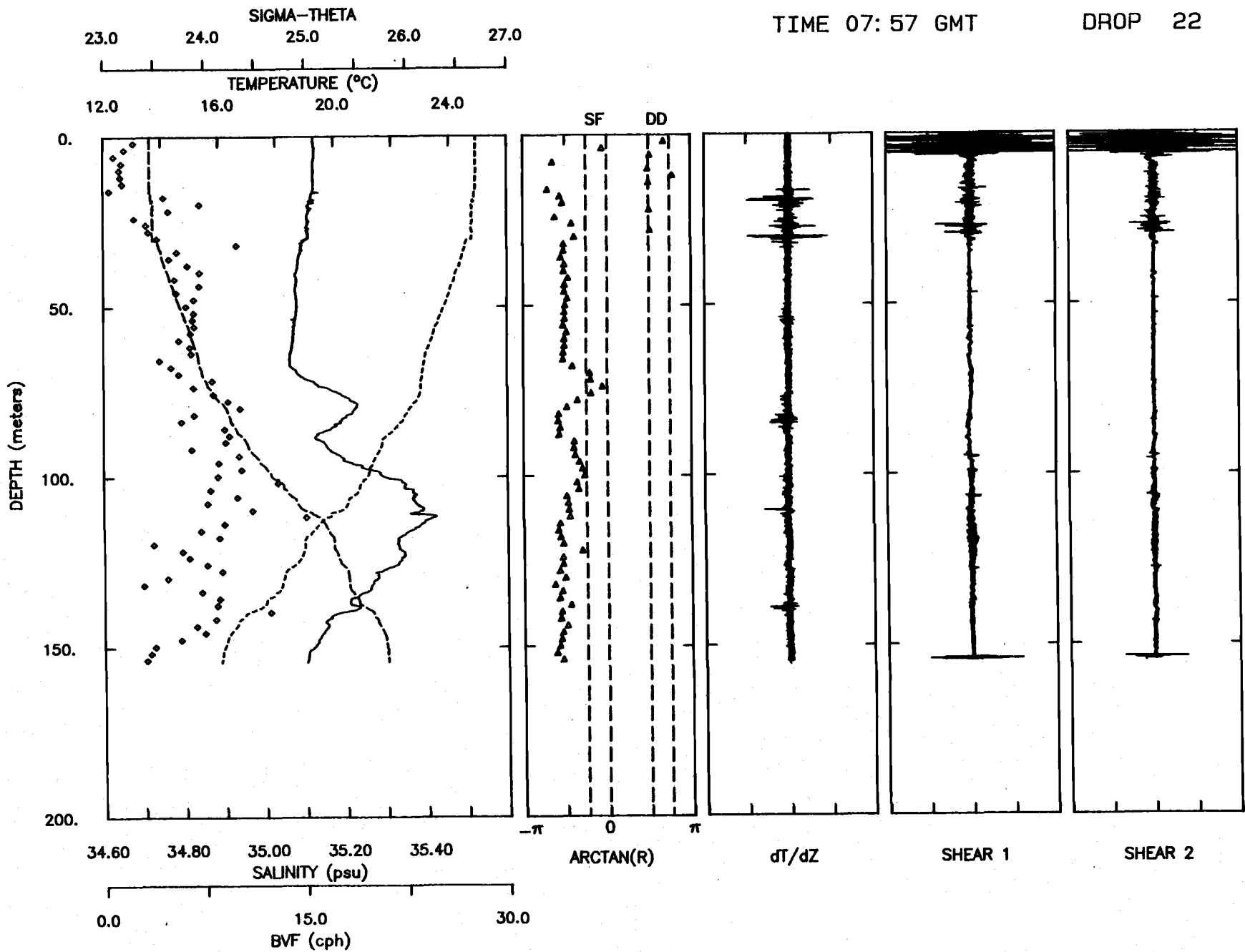
DATE 11/27/84
TIME 06:58 GMT

TAPE 138
DROP 14



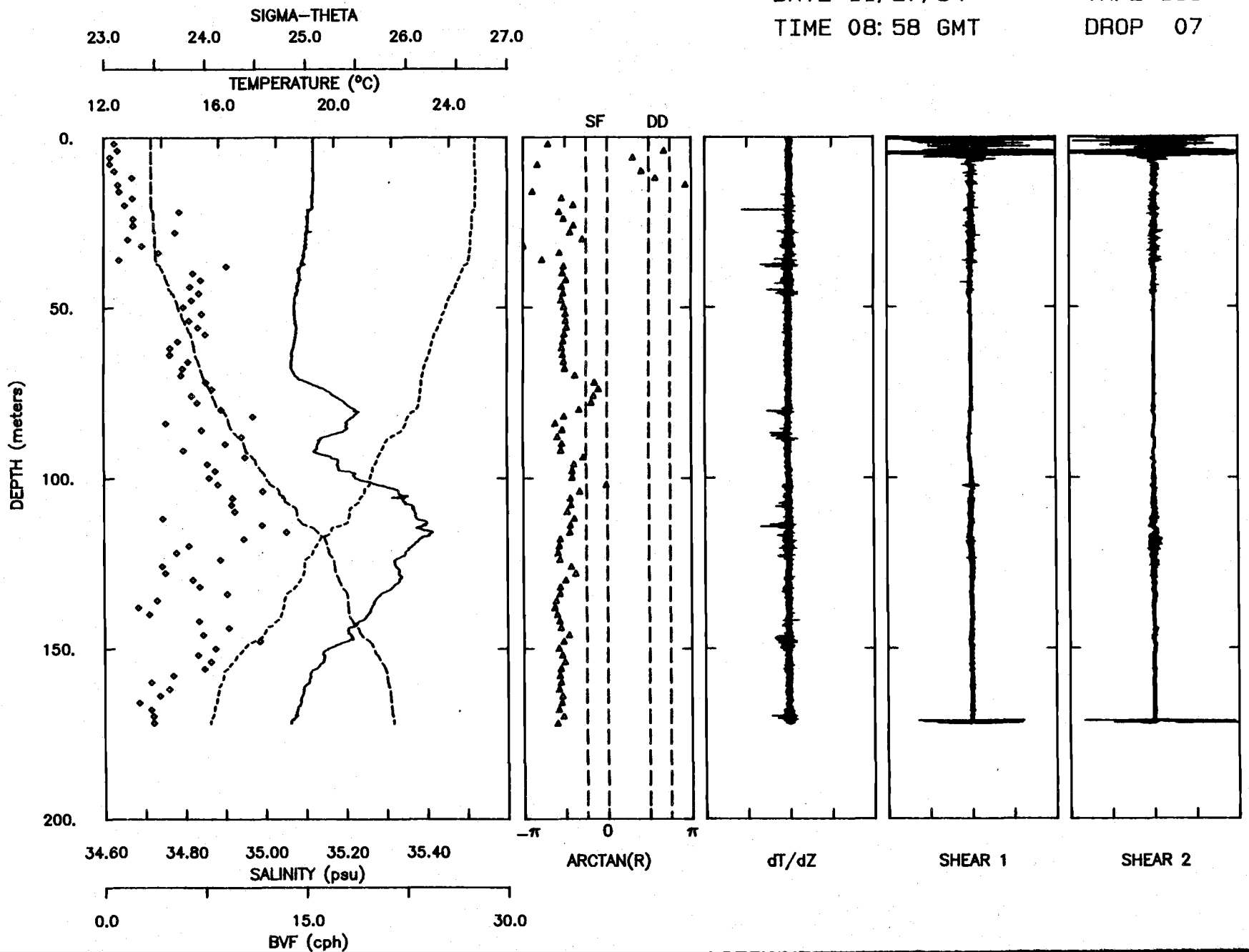
DATE 11/27/84
TIME 07:57 GMT

TAPE 138
DROP 22



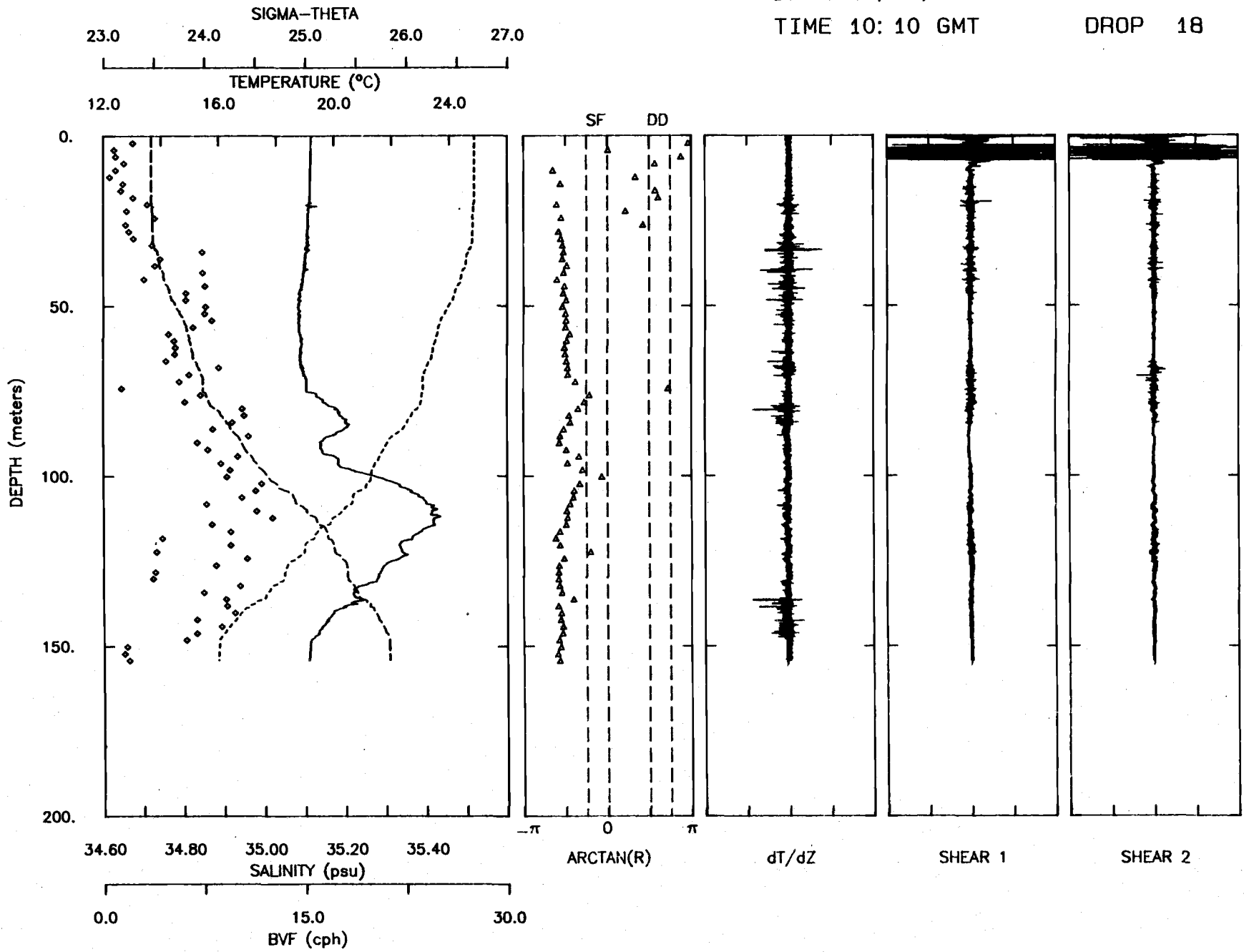
DATE 11/27/84
TIME 08: 58 GMT

TAPE 139
DROP 07



DATE 11/27/84
TIME 10:10 GMT

TAPE 139
DROP 18

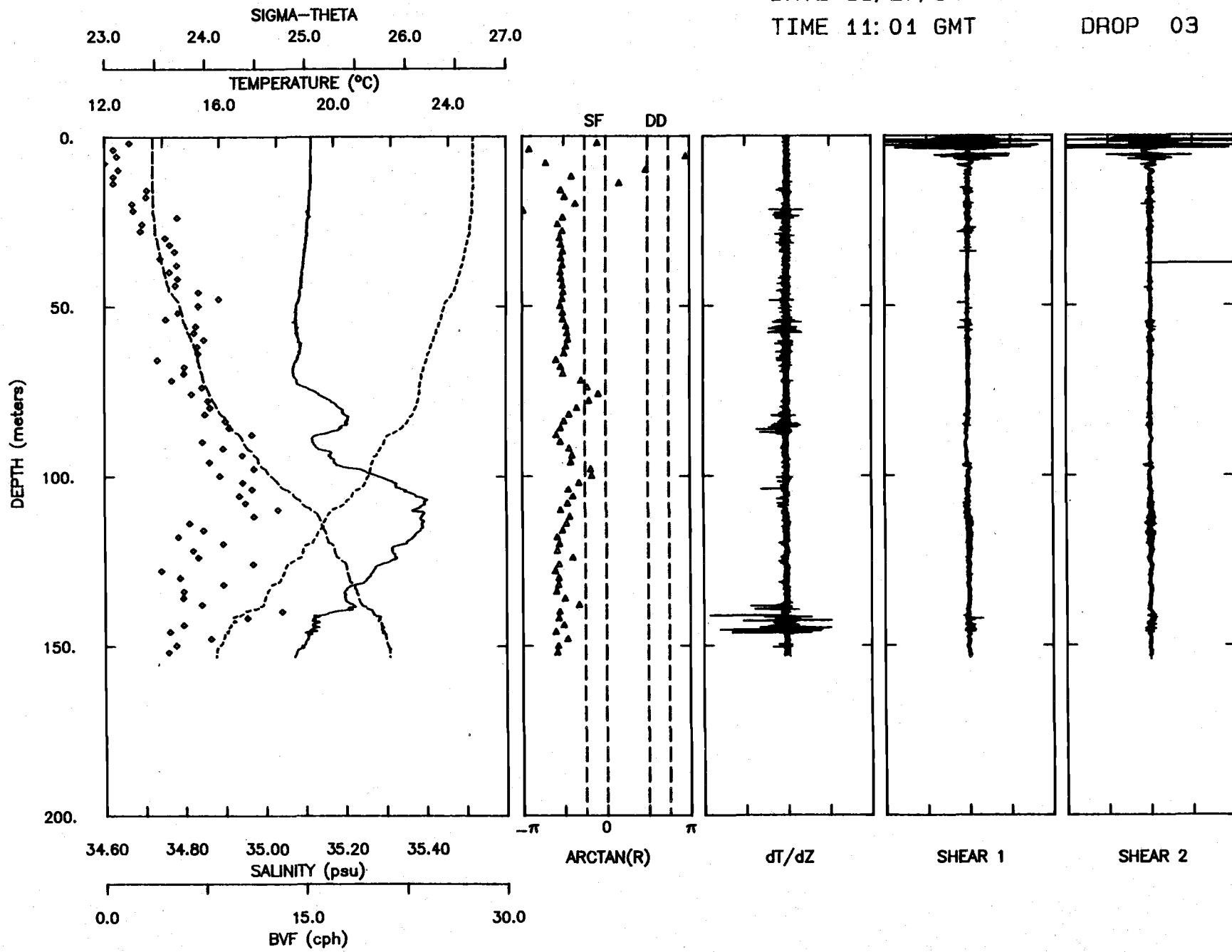


DATE 11/27/84

TAPE 140

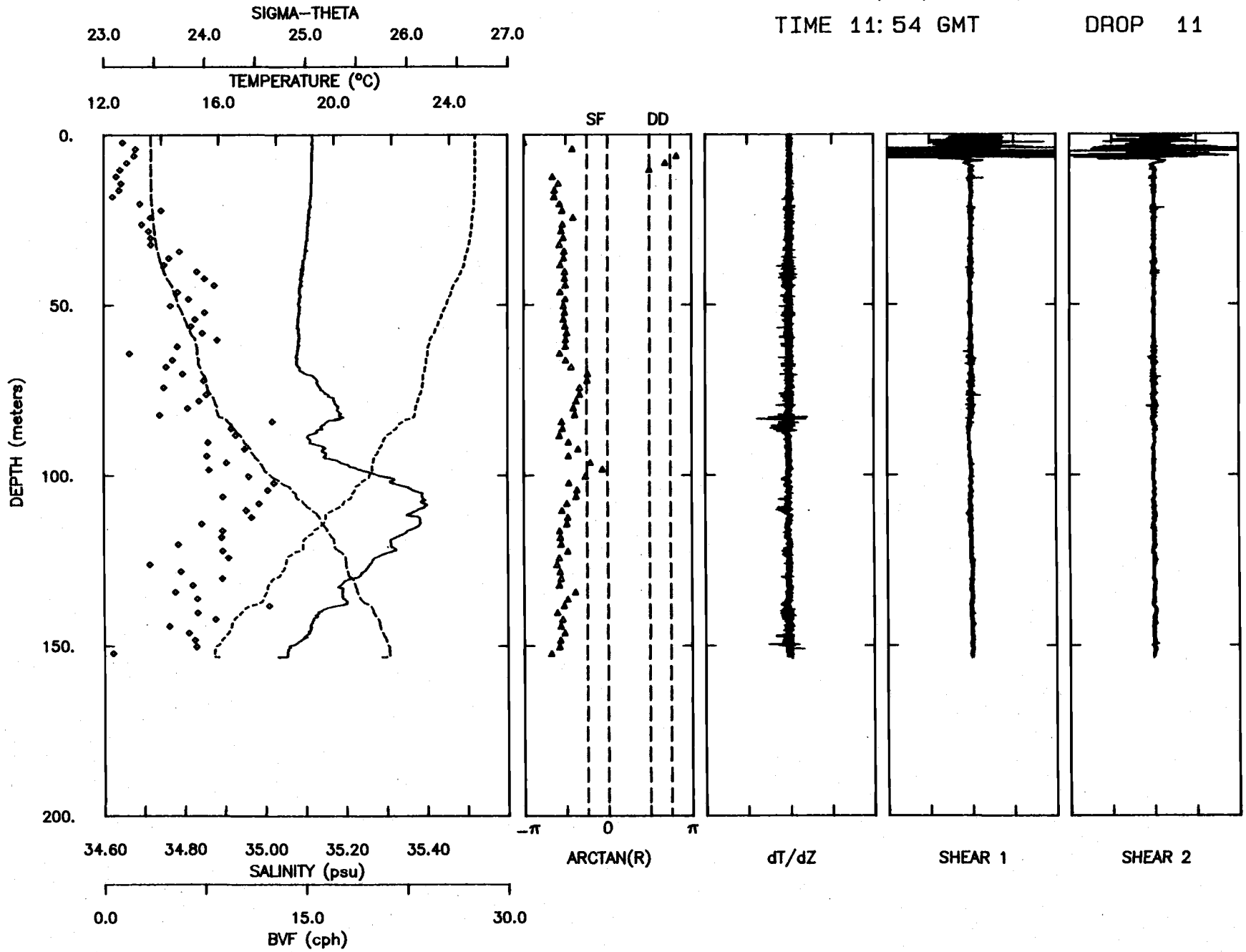
TIME 11:01 GMT

DROP 03



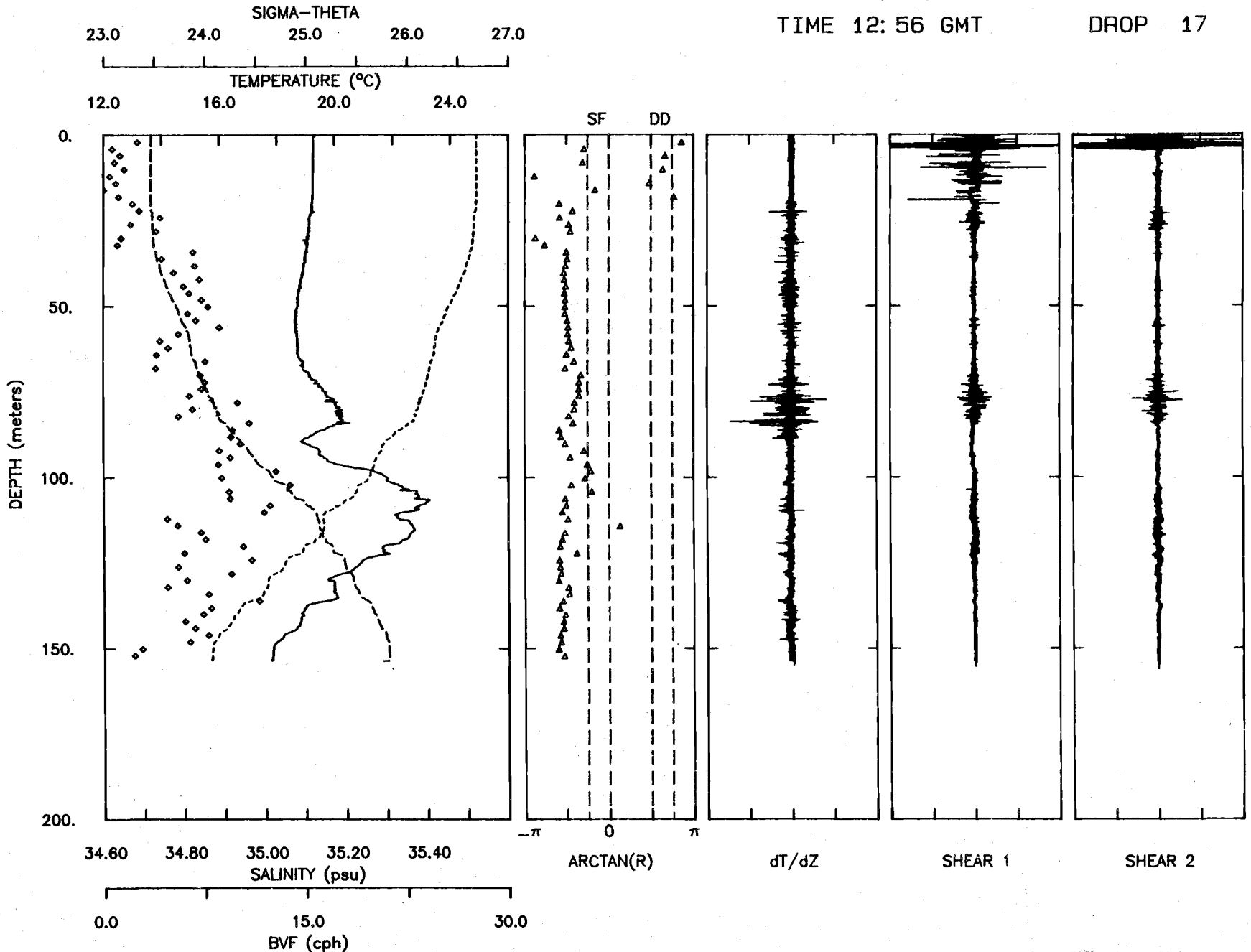
DATE 11/27/84
TIME 11:54 GMT

TAPE 140
DROP 11



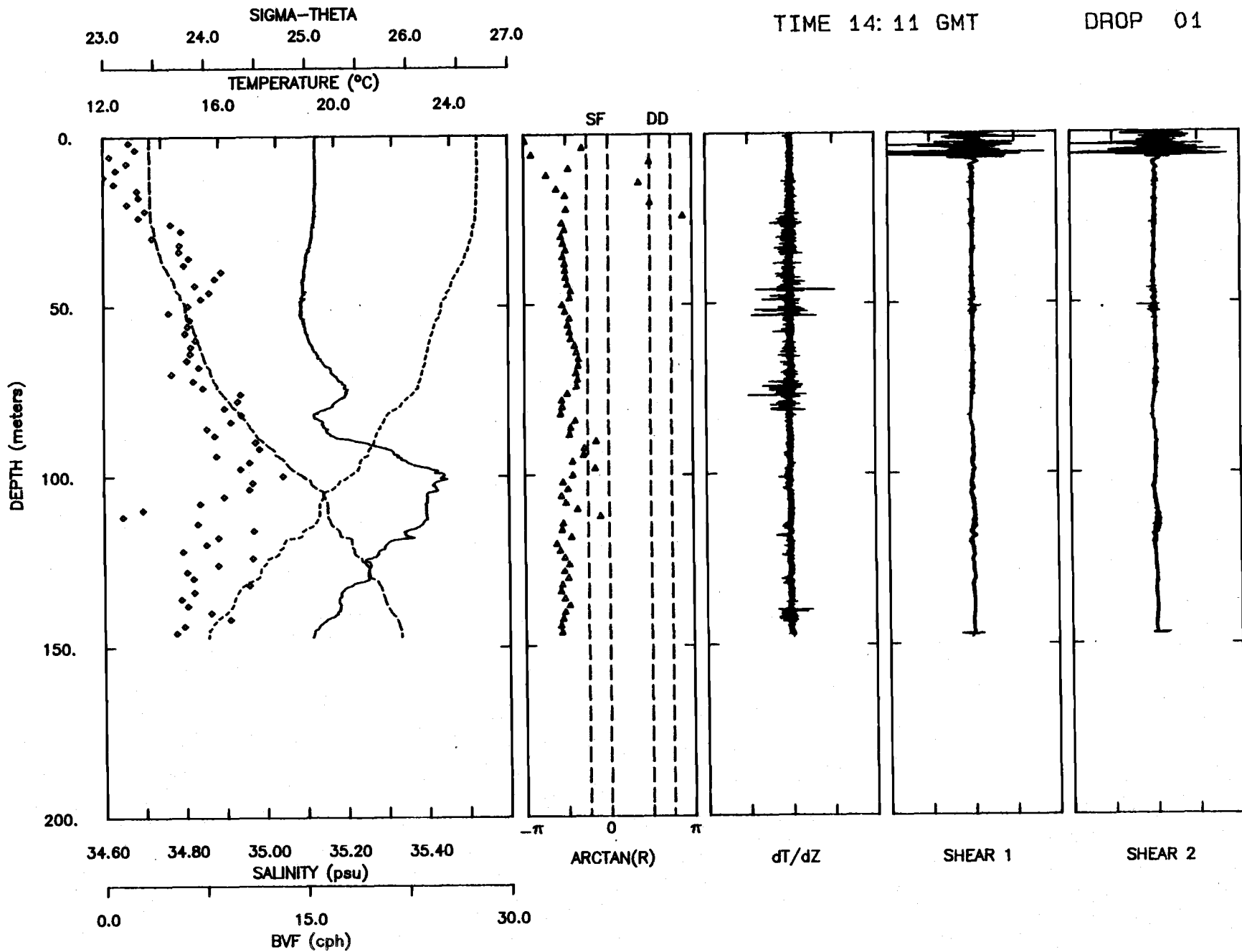
DATE 11/27/84
TIME 12:56 GMT

TAPE 140
DROP 17



DATE 11/27/84
TIME 14:11 GMT

TAPE 141
DROP 01

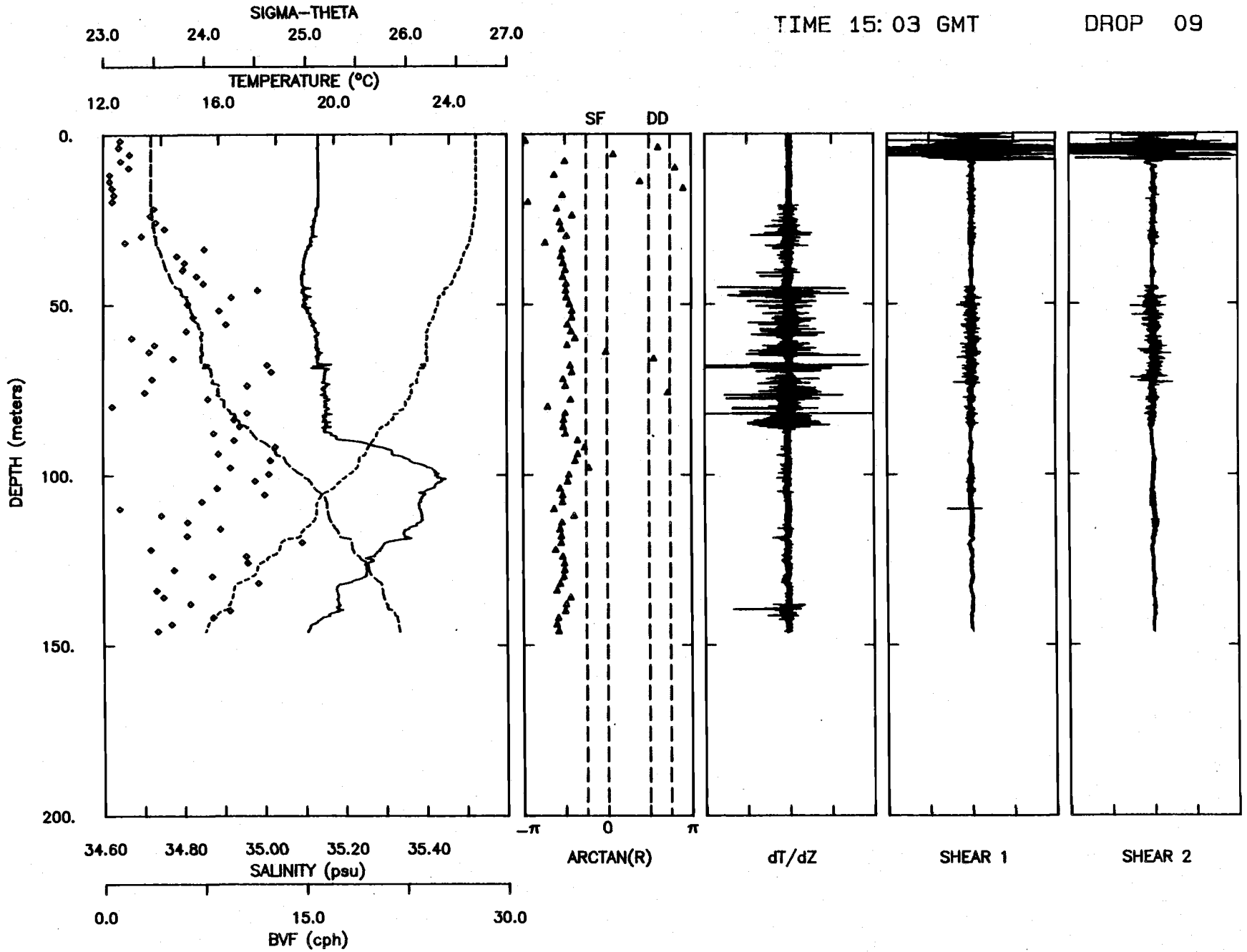


DATE 11/27/84

TAPE 141

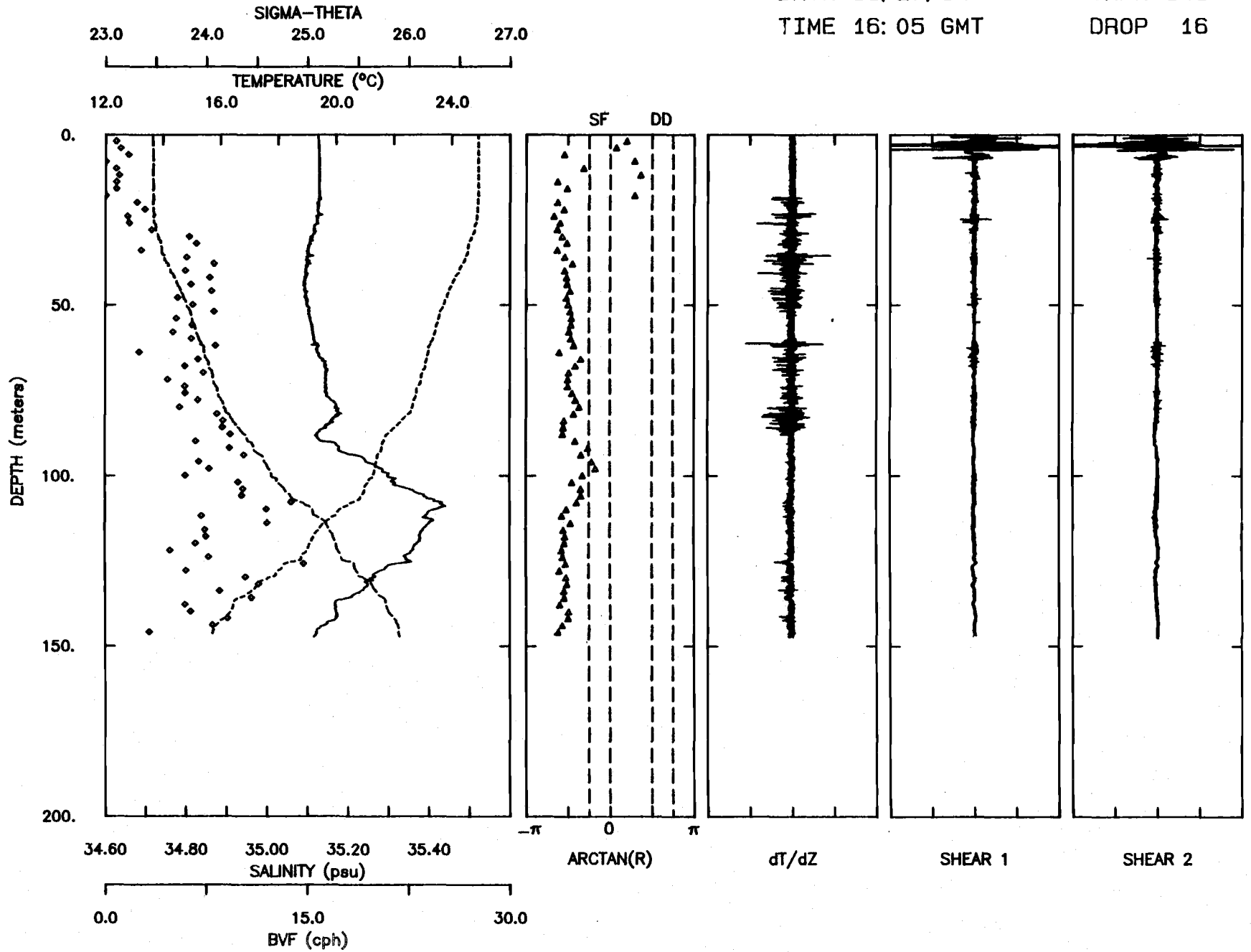
TIME 15:03 GMT

DROP 09



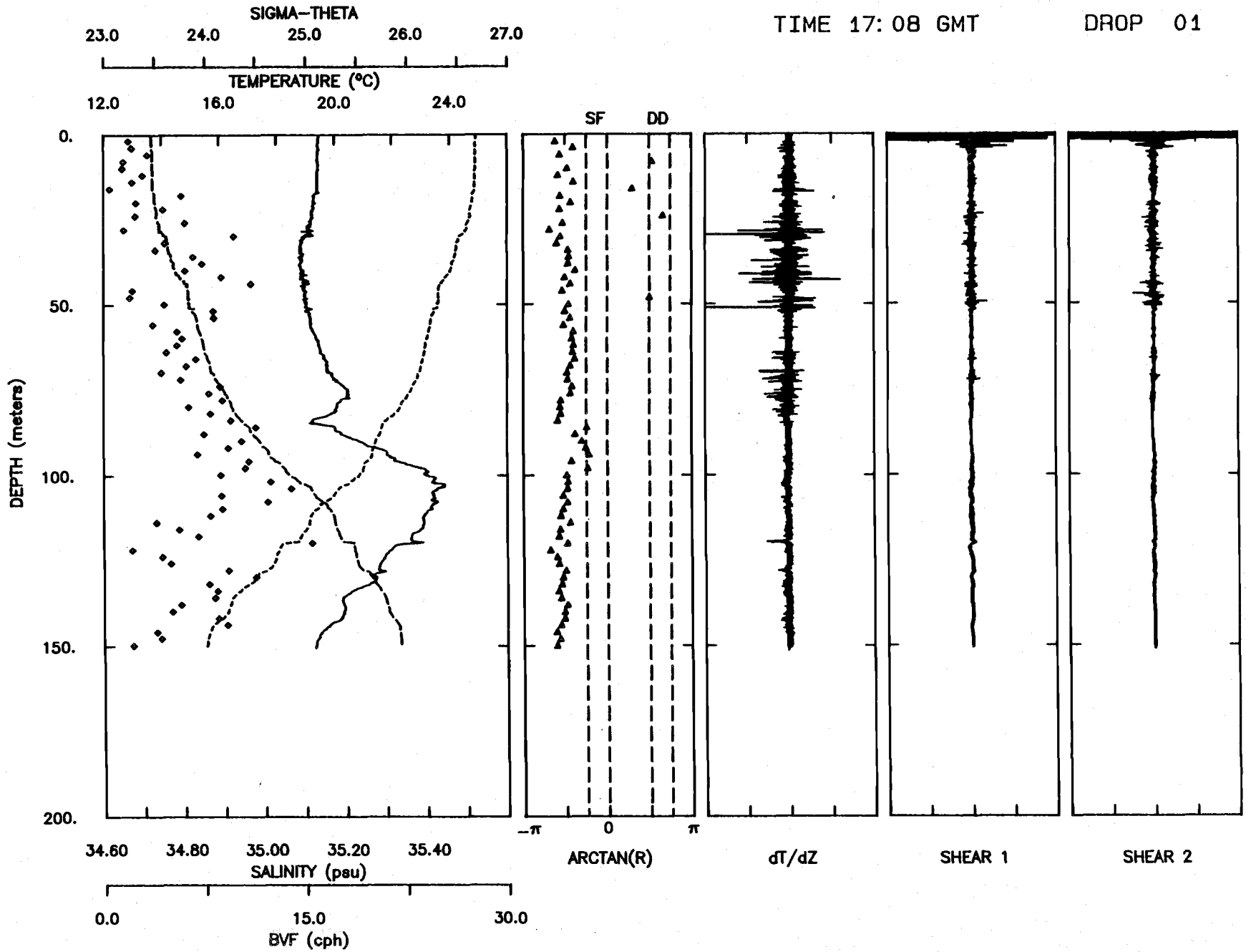
DATE 11/27/84
TIME 16:05 GMT

TAPE 141
DROP 16



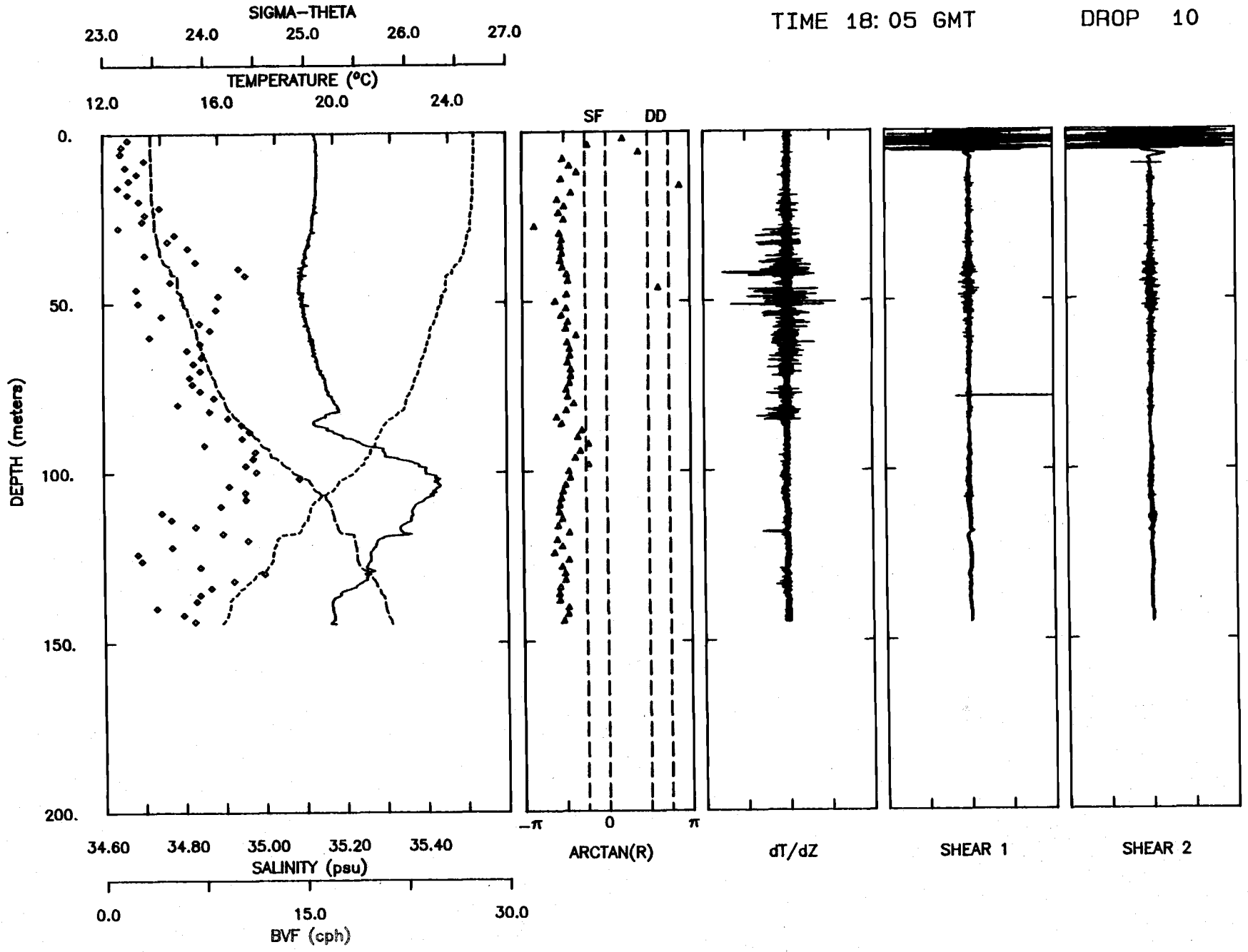
DATE 11/27/84
TIME 17:08 GMT

TAPE 142
DROP 01



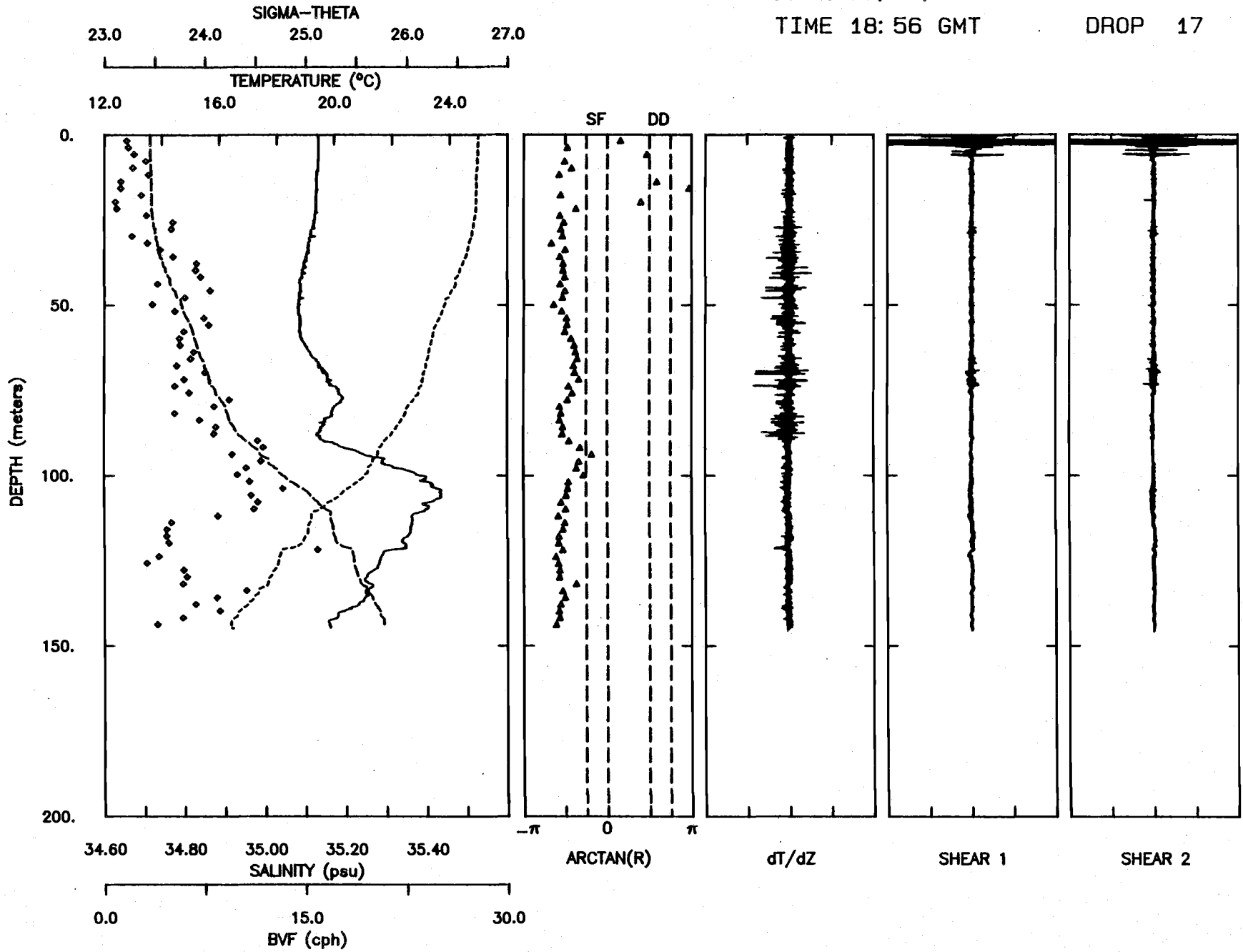
DATE 11/27/84
TIME 18:05 GMT

TAPE 142
DROP 10



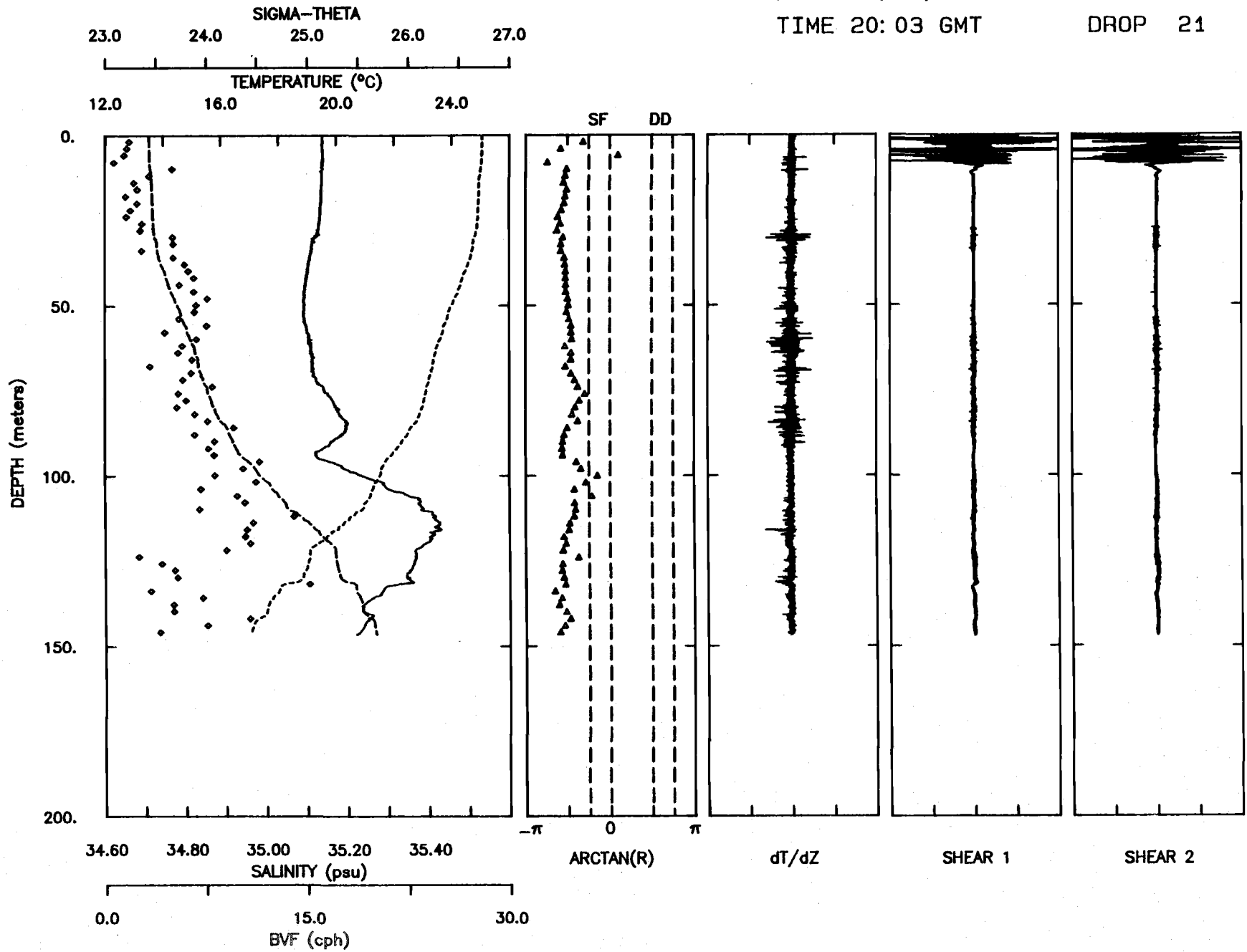
DATE 11/27/84
TIME 18:56 GMT

TAPE 142
DROP 17



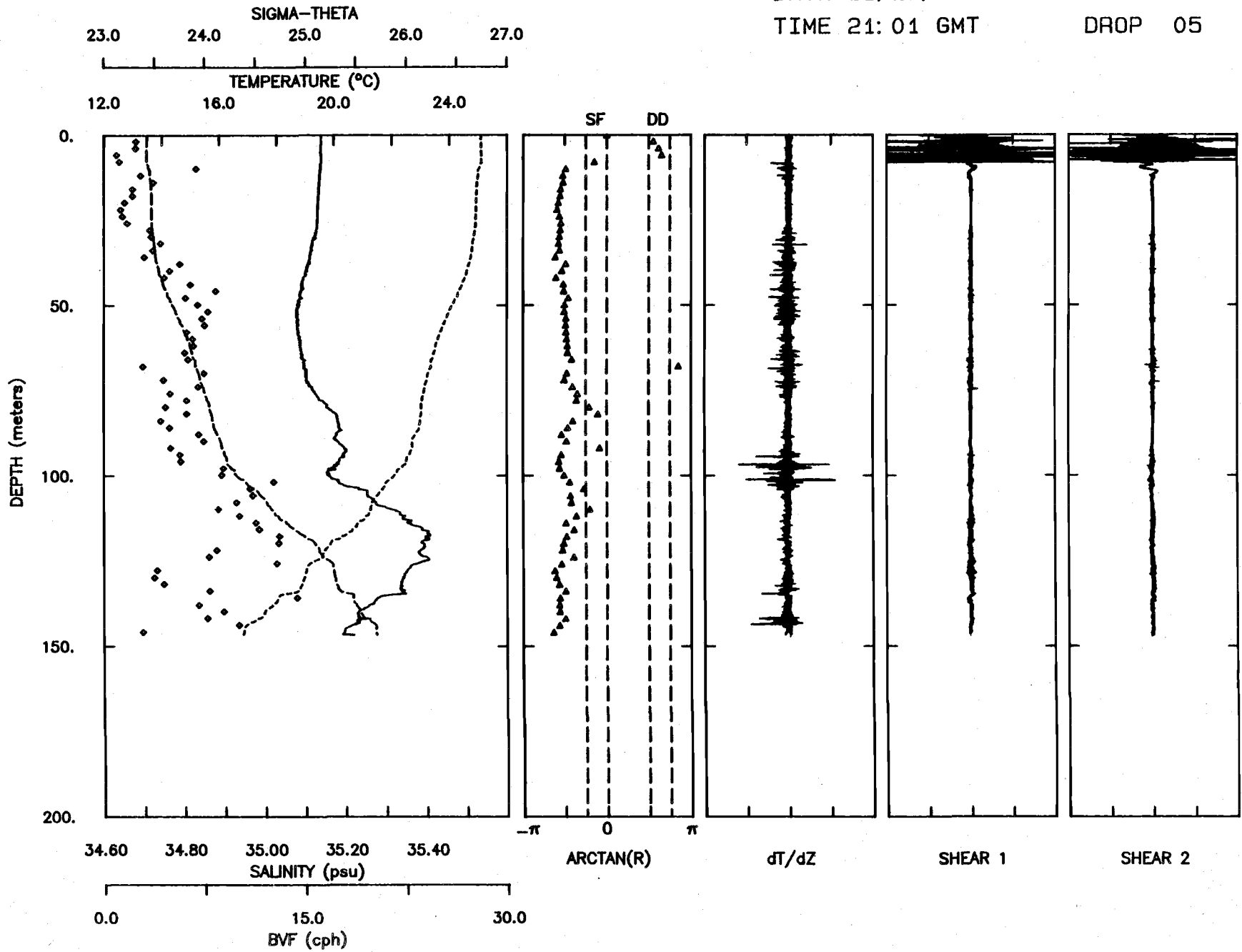
DATE 11/27/84
TIME 20:03 GMT

TAPE 142
DROP 21



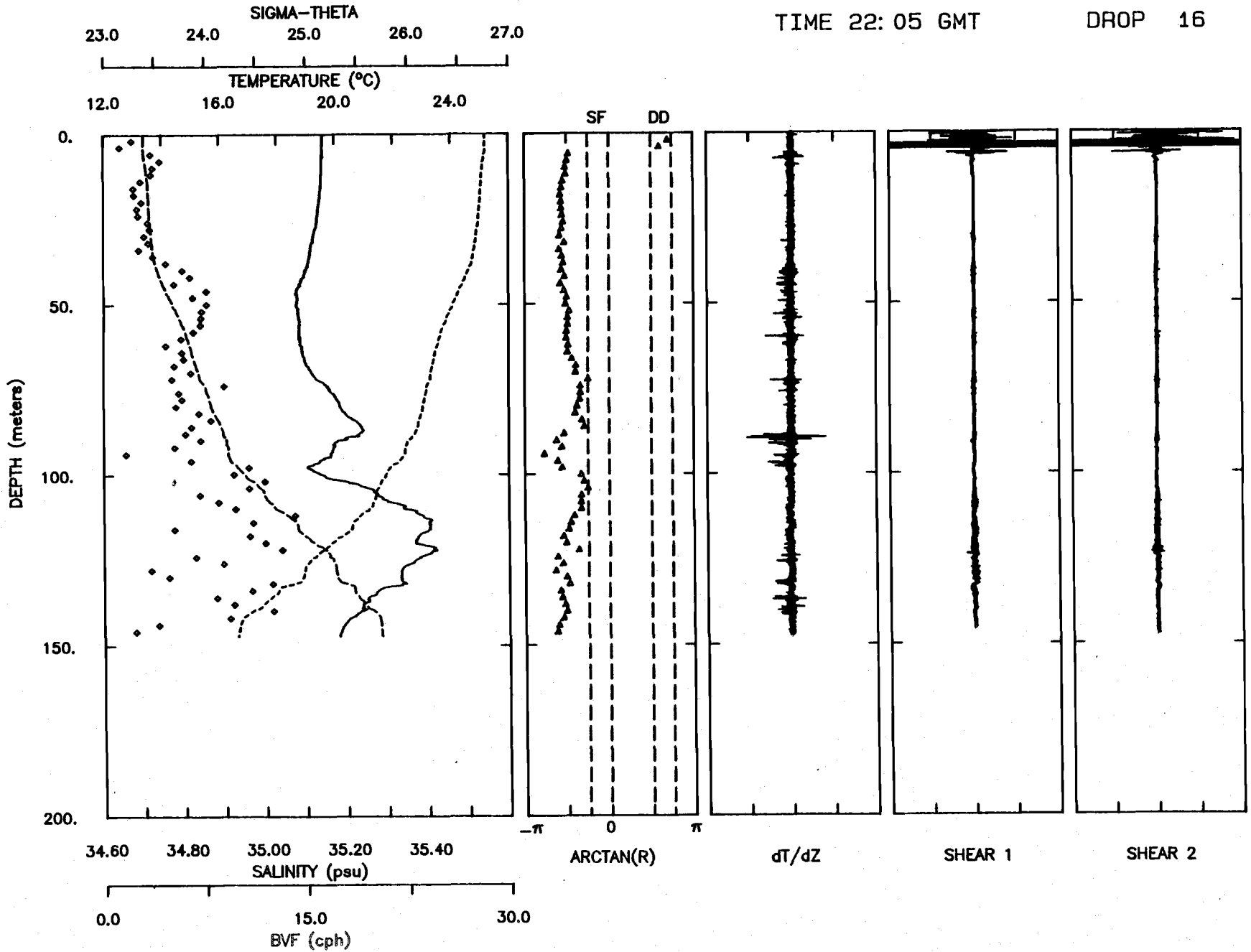
DATE 11/27/84
TIME 21:01 GMT

TAPE 143
DROP 05



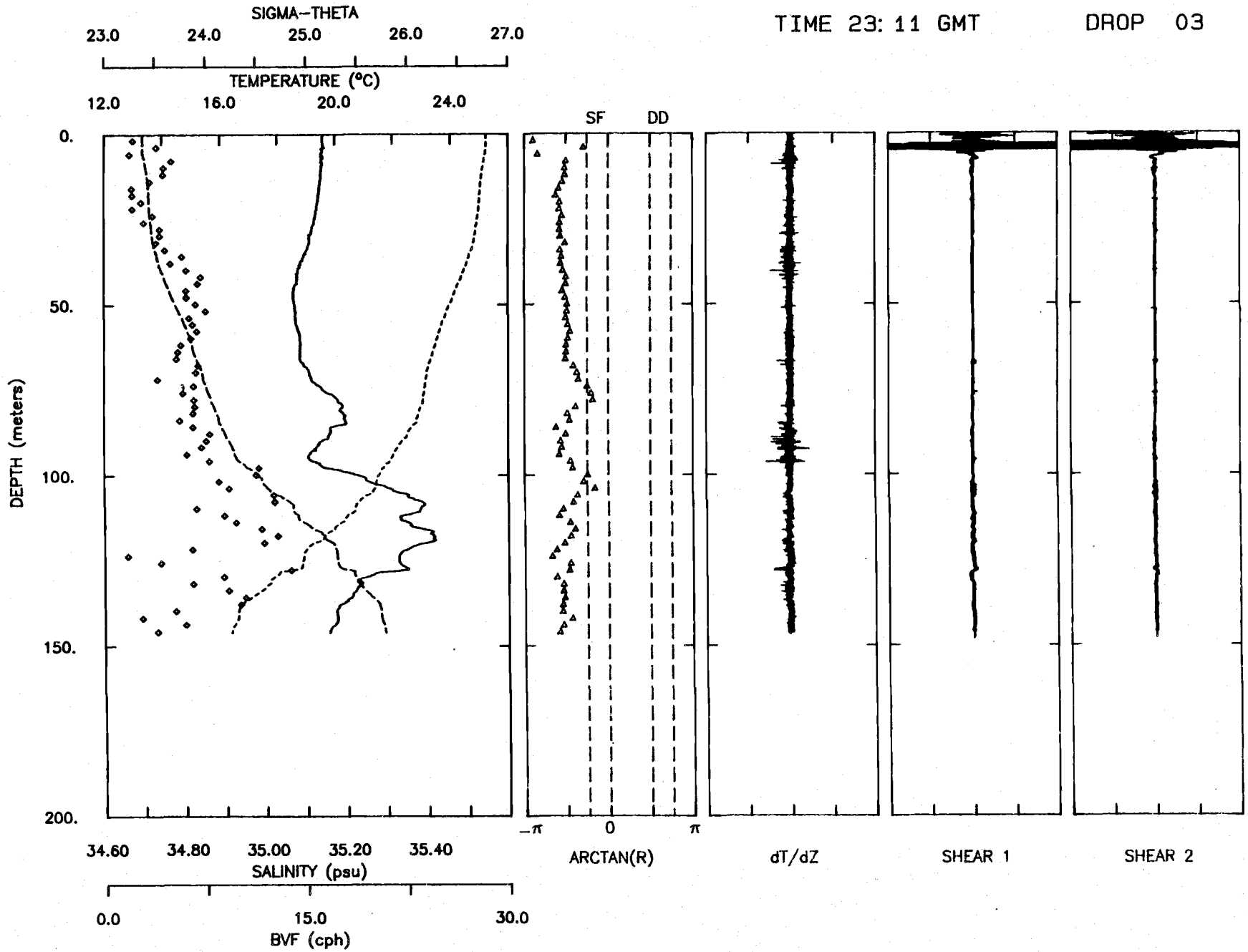
DATE 11/27/84
TIME 22:05 GMT

TAPE 143
DROP 16



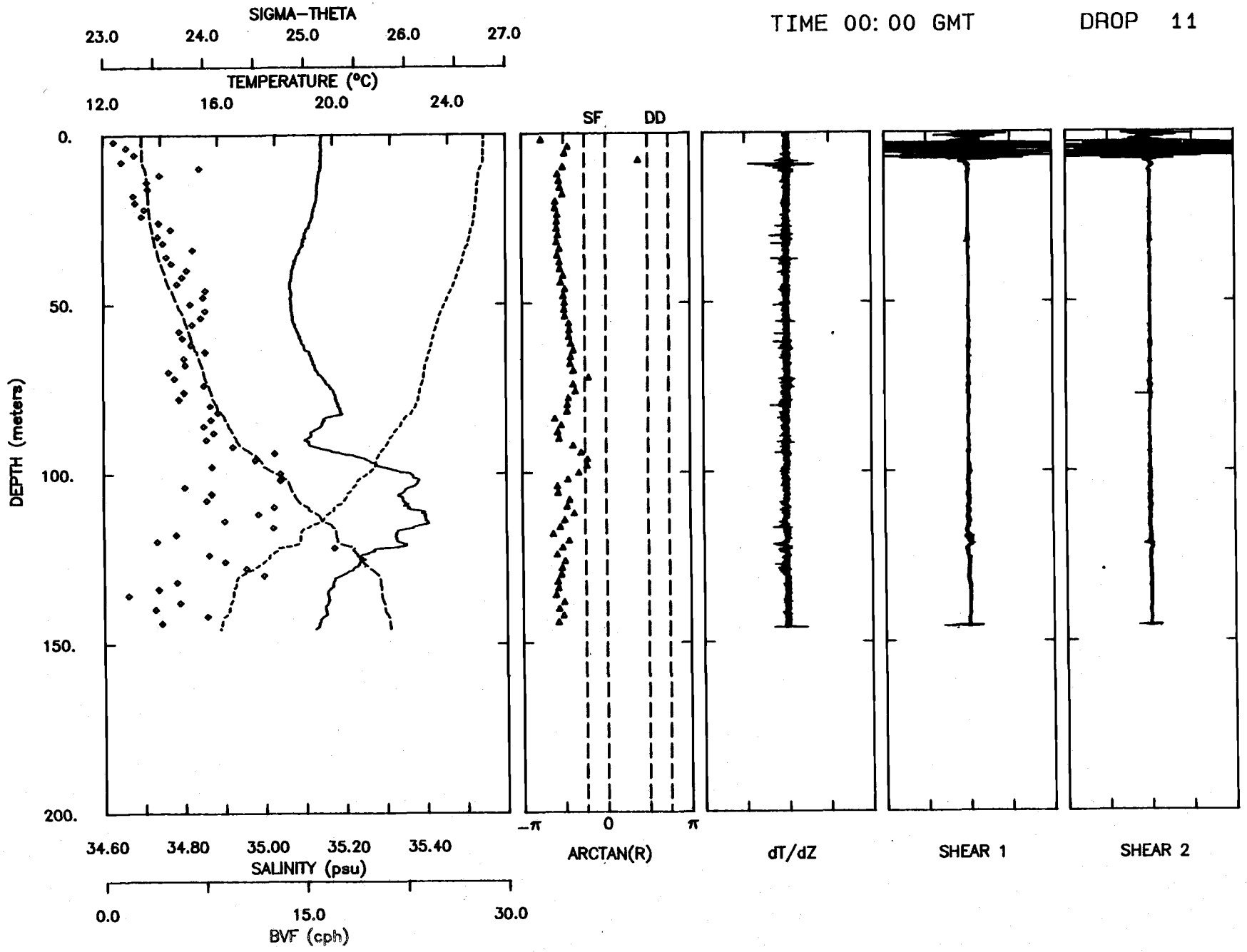
DATE 11/27/84
TIME 23:11 GMT

TAPE 144
DROP 03



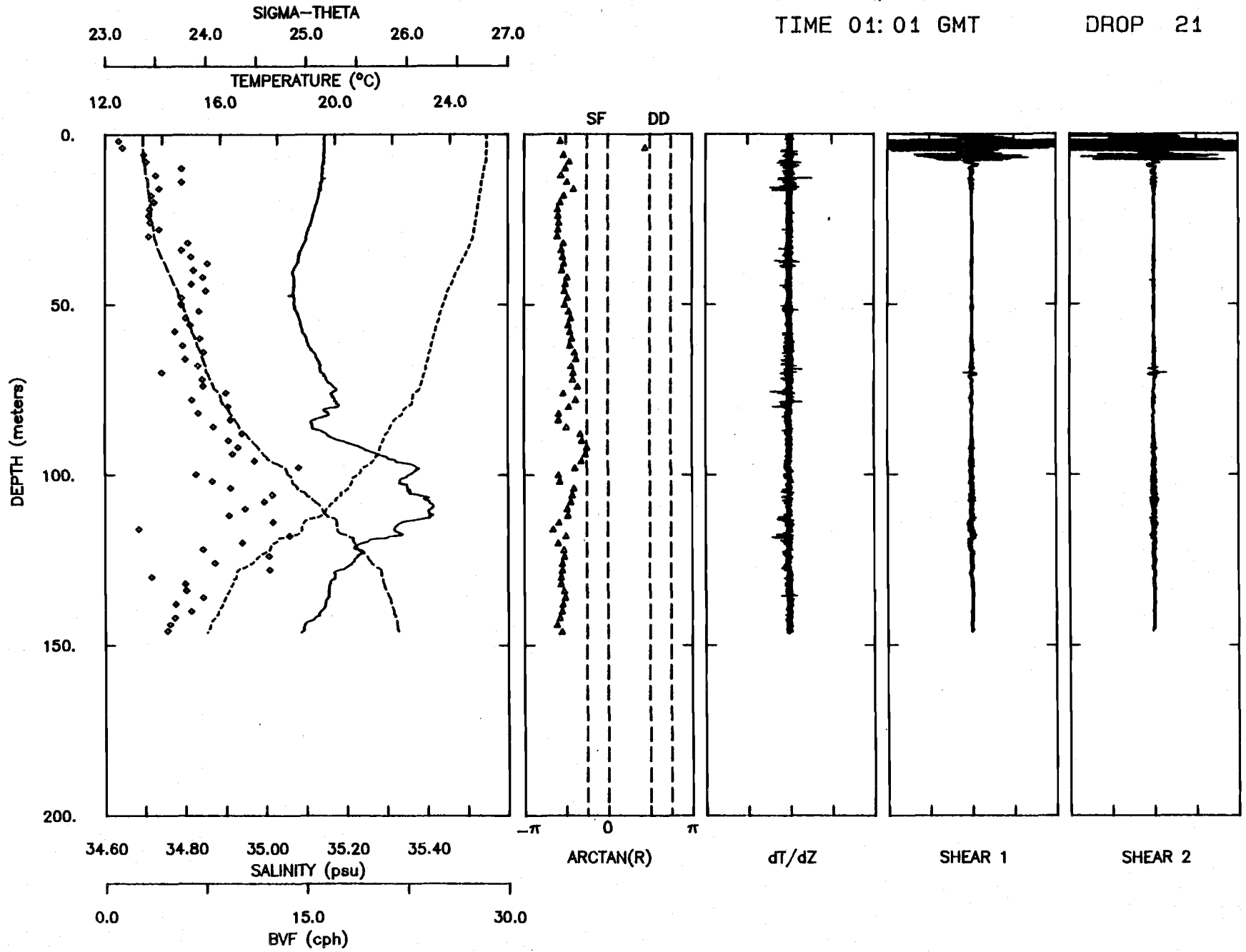
DATE 11/28/84
TIME 00:00 GMT

TAPE 144
DROP 11



DATE 11/28/84
TIME 01:01 GMT

TAPE 144
DROP 21

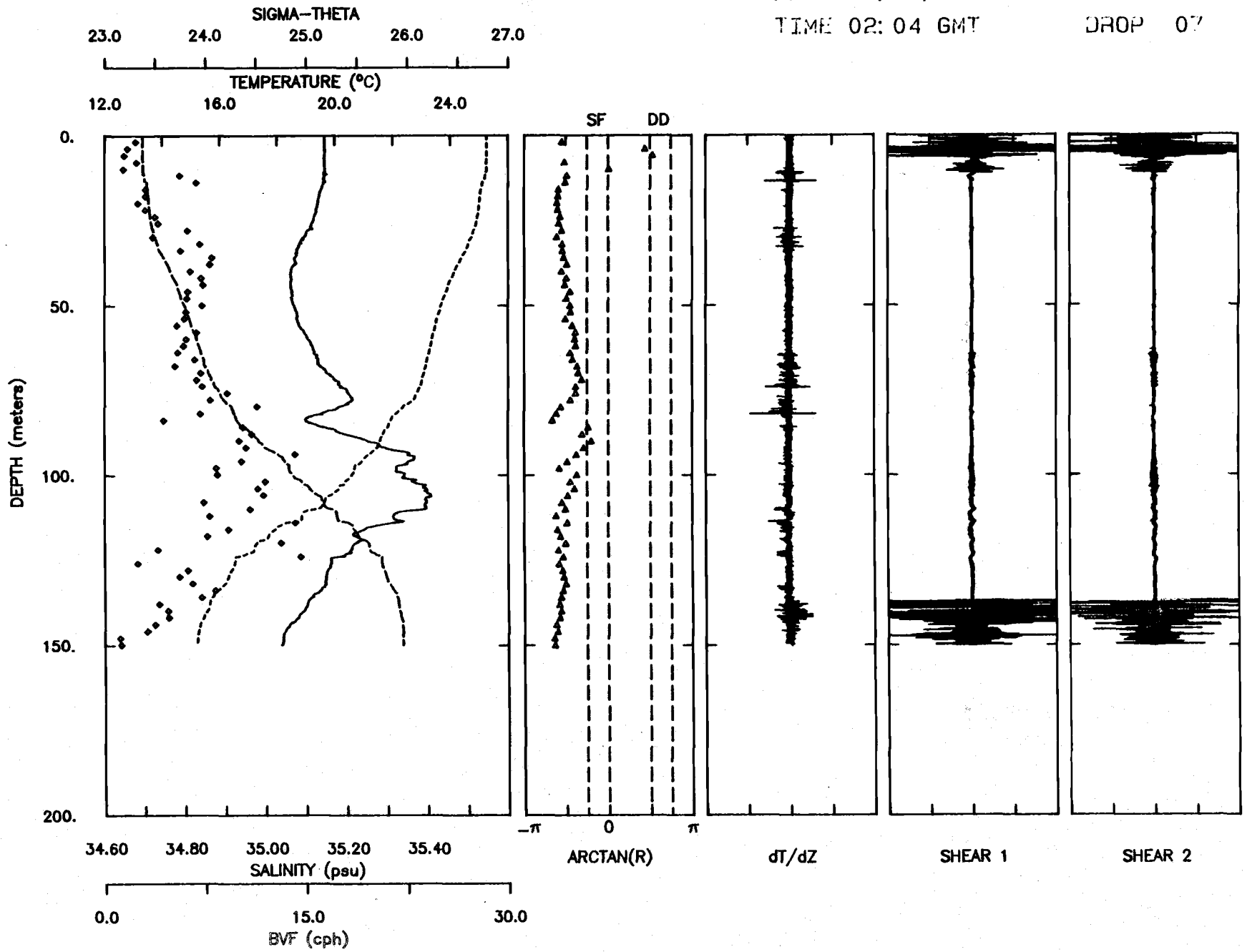


DATE 11/28/84

TAPE 145

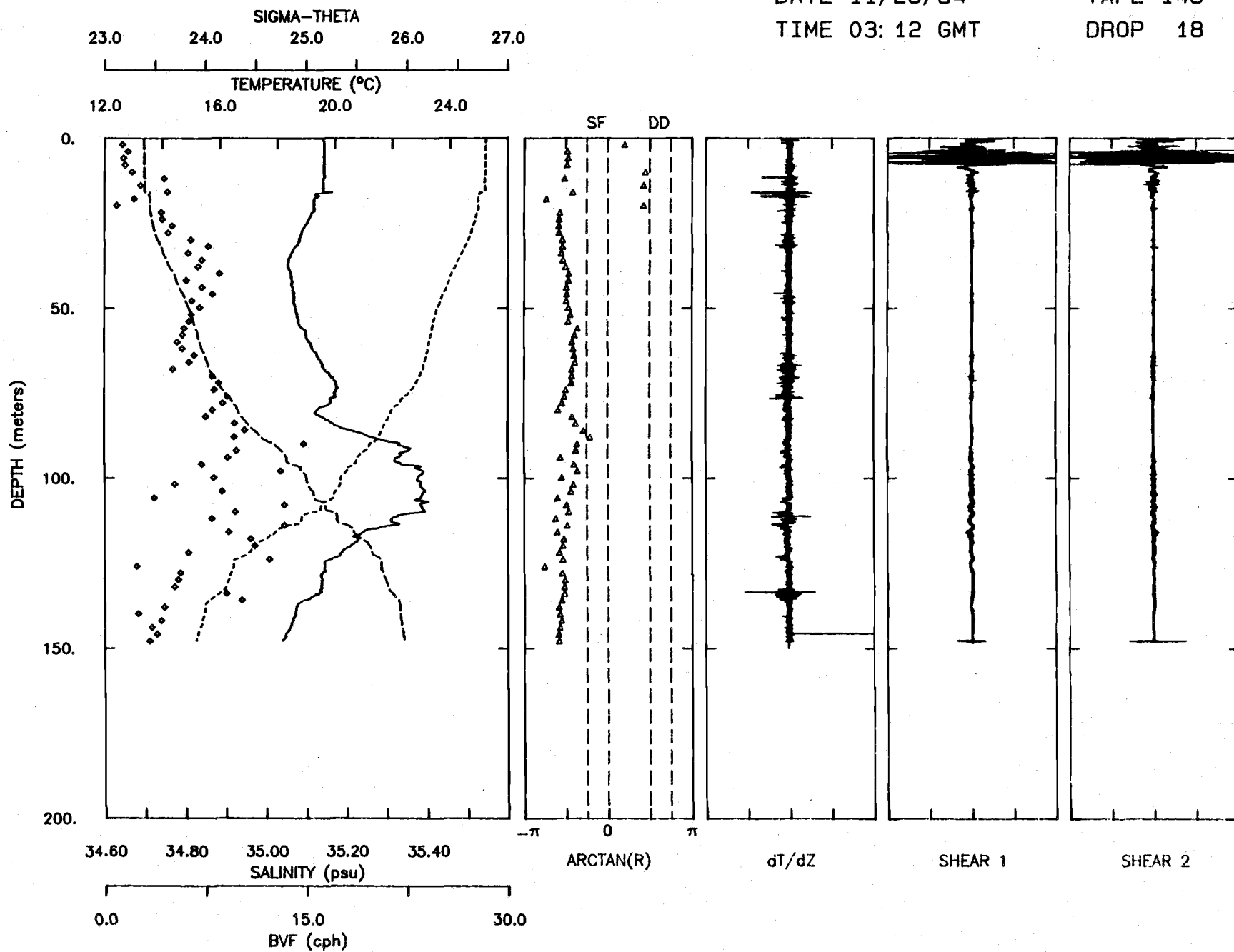
TIME 02:04 GMT

DROP 07



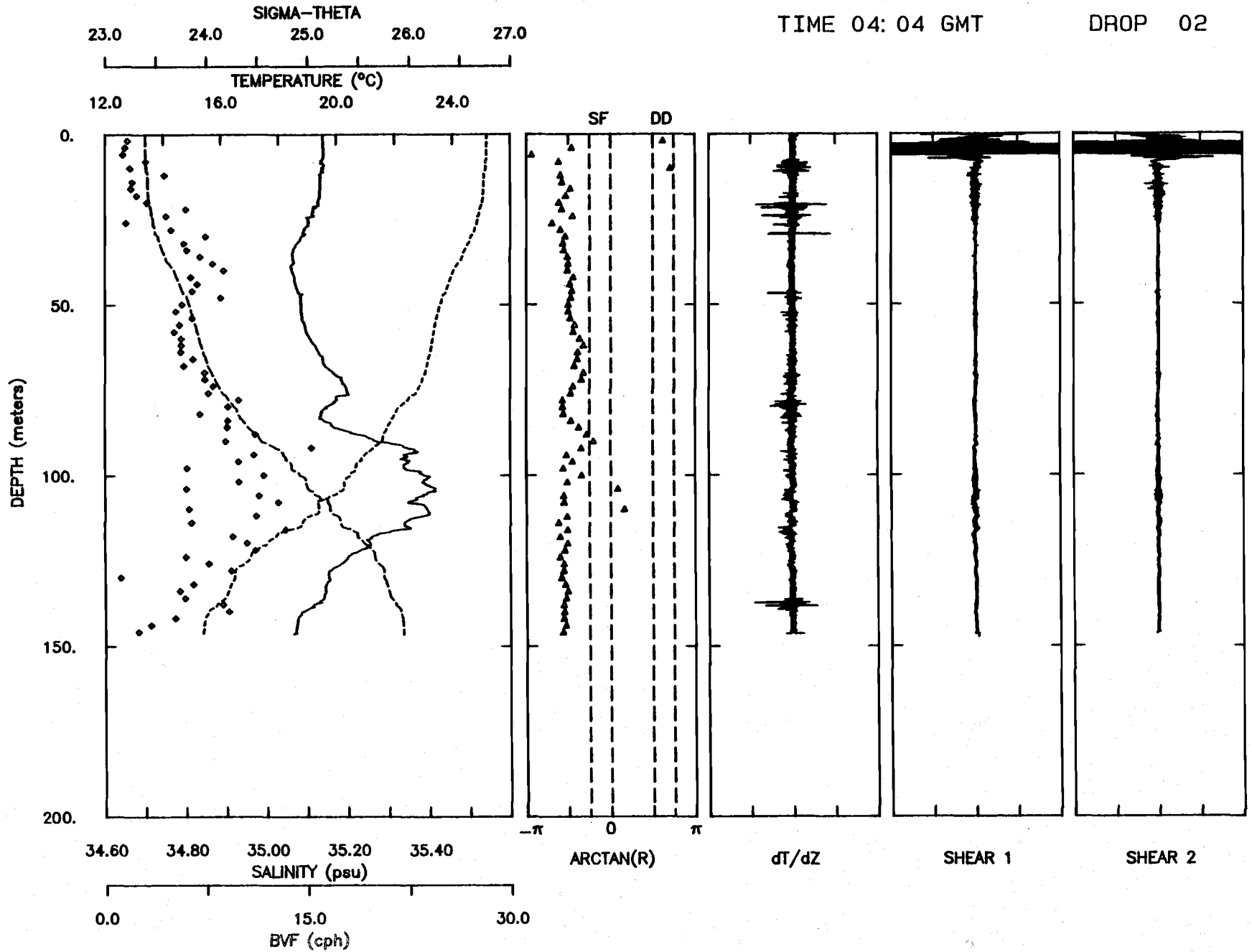
DATE 11/28/84
TIME 03:12 GMT

TAPE 145
DROP 18



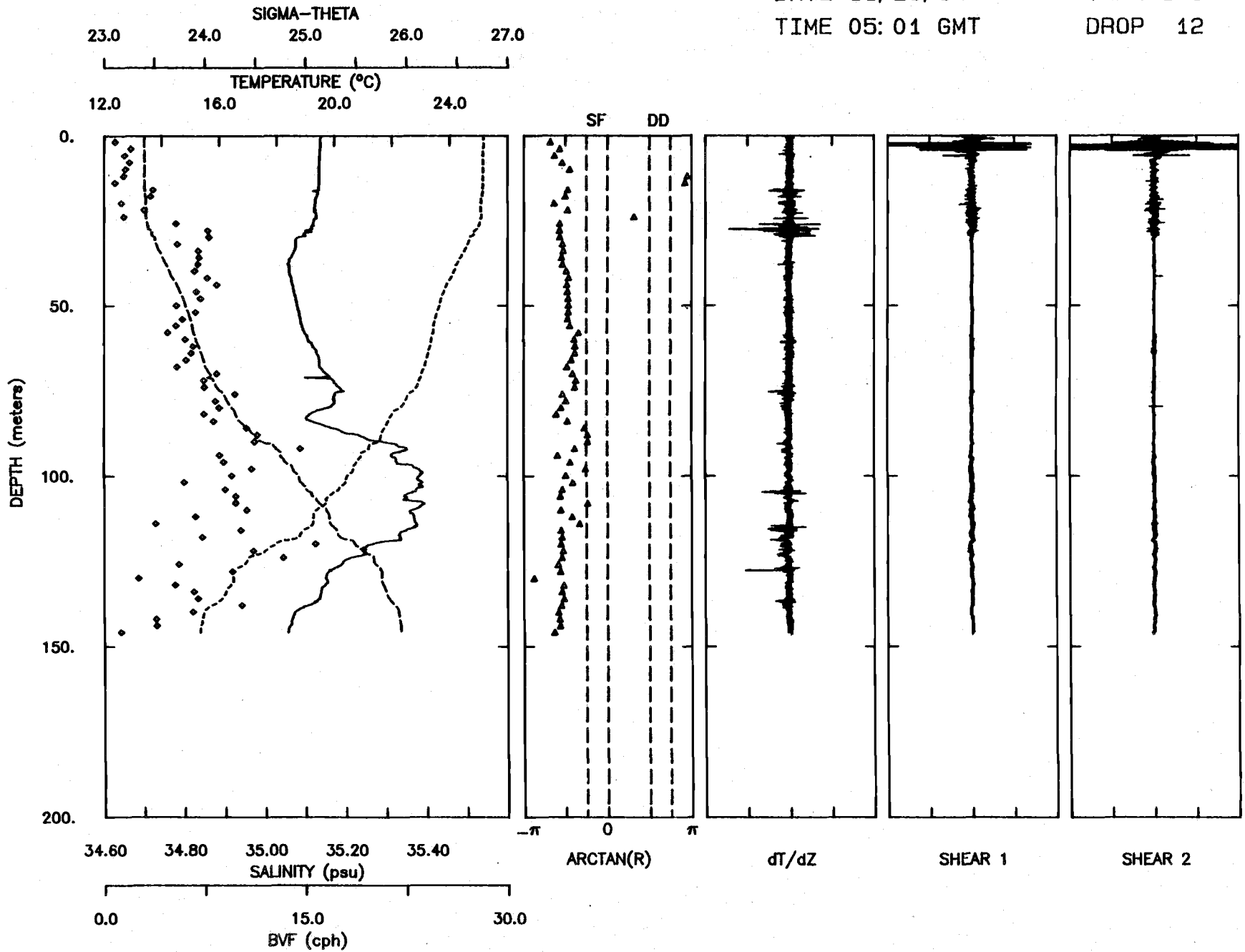
DATE 11/28/84
TIME 04:04 GMT

TAPE 146
DROP 02



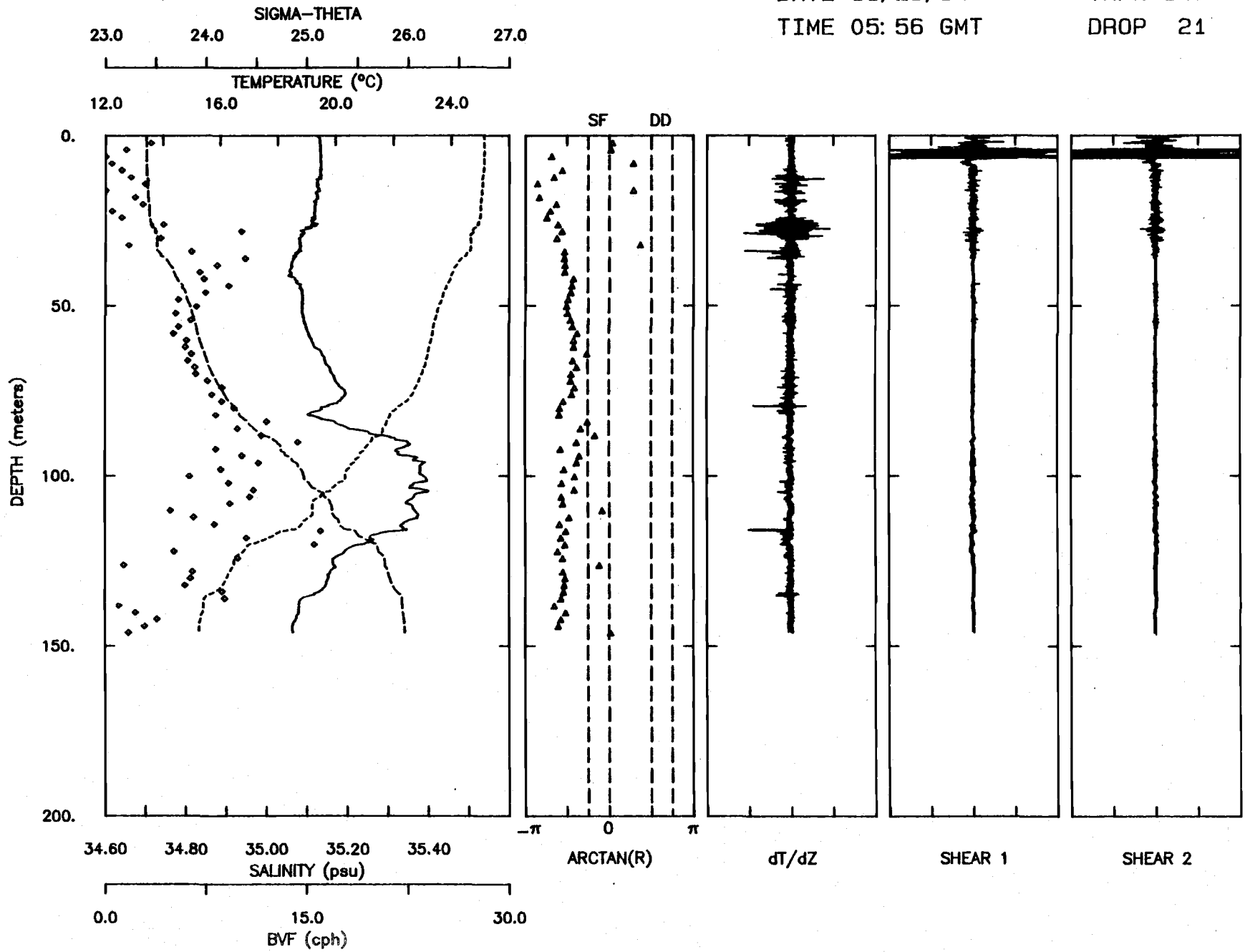
DATE 11/28/84
TIME 05:01 GMT

TAPE 146
DROP 12



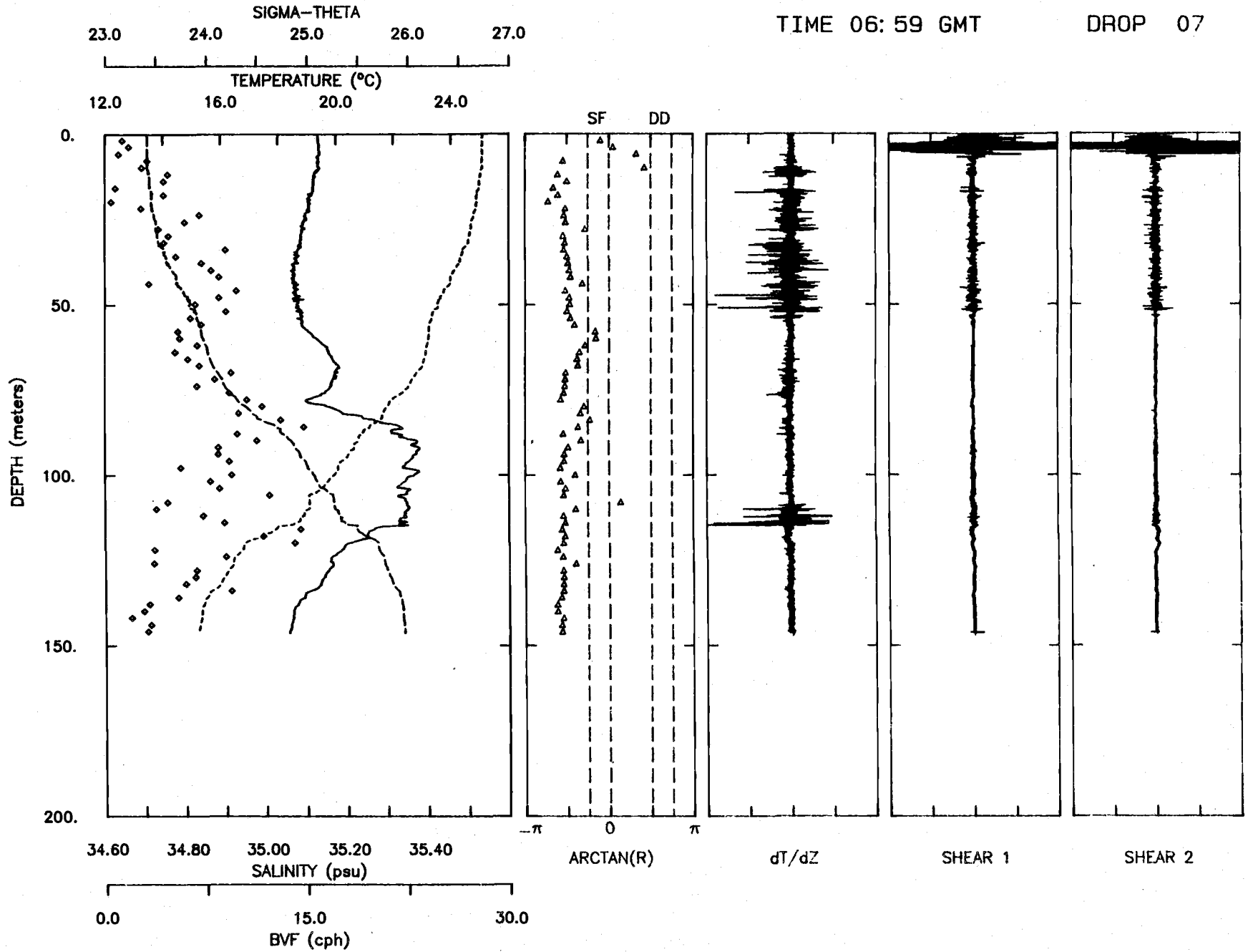
DATE 11/28/84
TIME 05: 56 GMT

TAPE 146
DROP 21



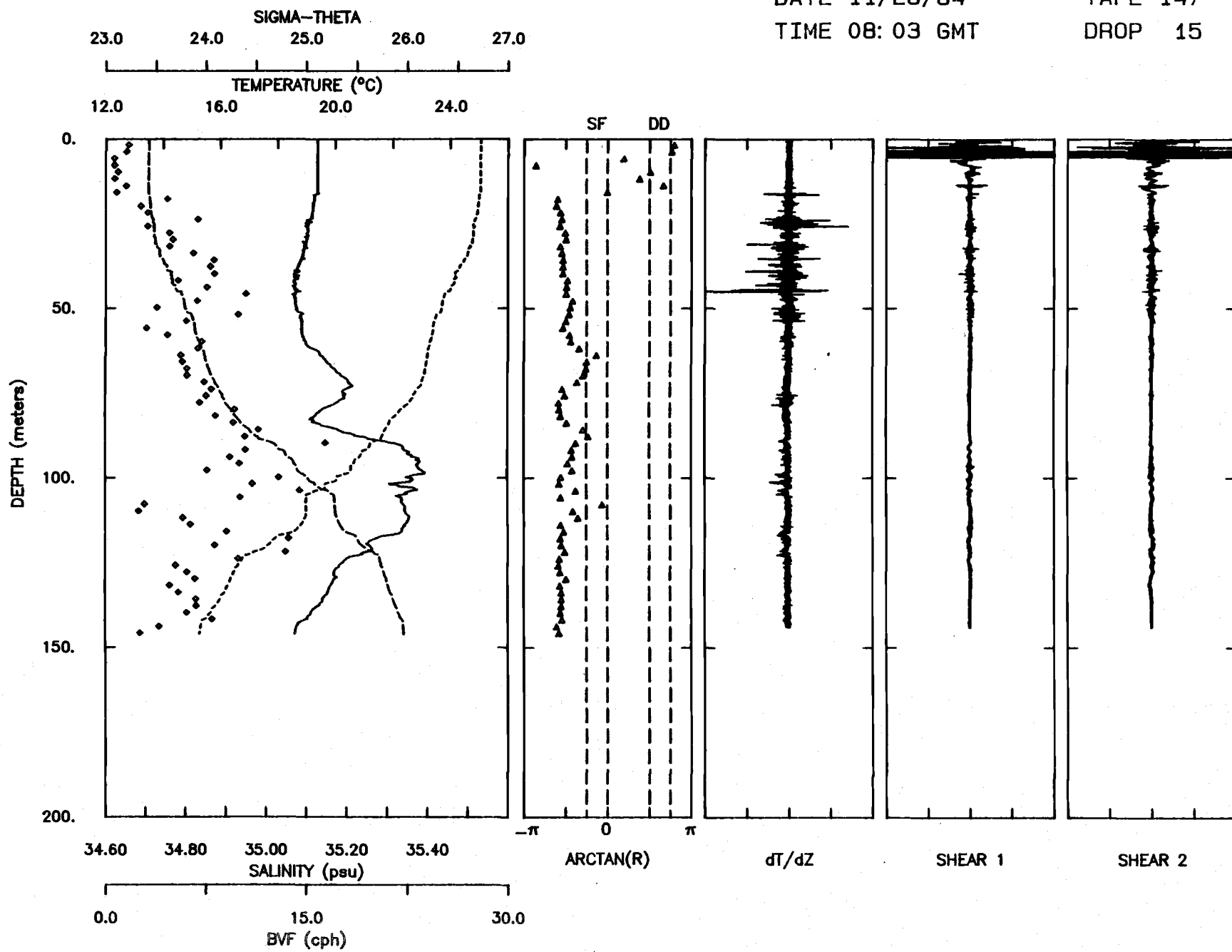
DATE 11/28/84
TIME 06:59 GMT

TAPE 147
DROP 07



DATE 11/28/84
TIME 08:03 GMT

TAPE 147
DROP 15

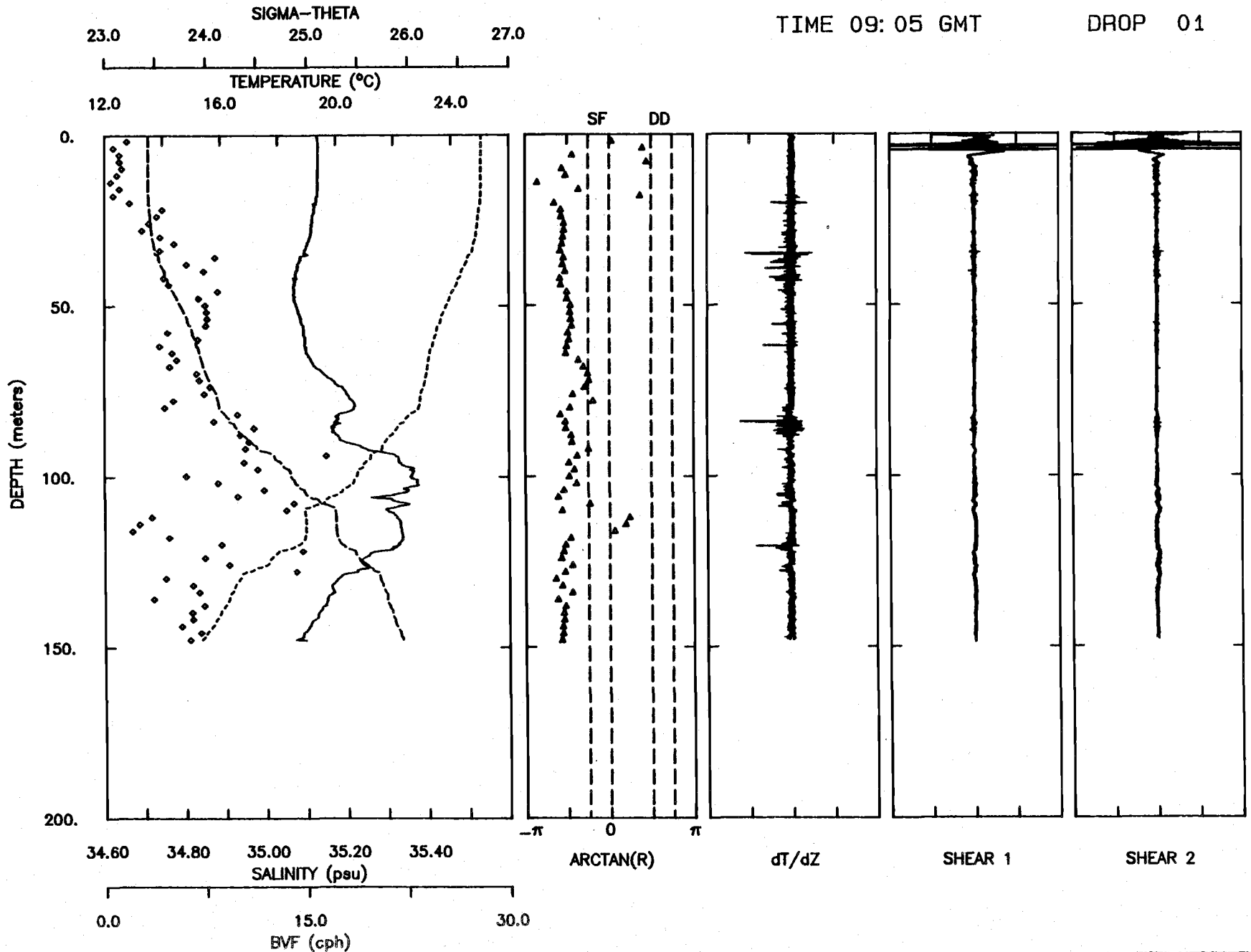


DATE 11/28/84

TAPE 148

TIME 09:05 GMT

DROP 01

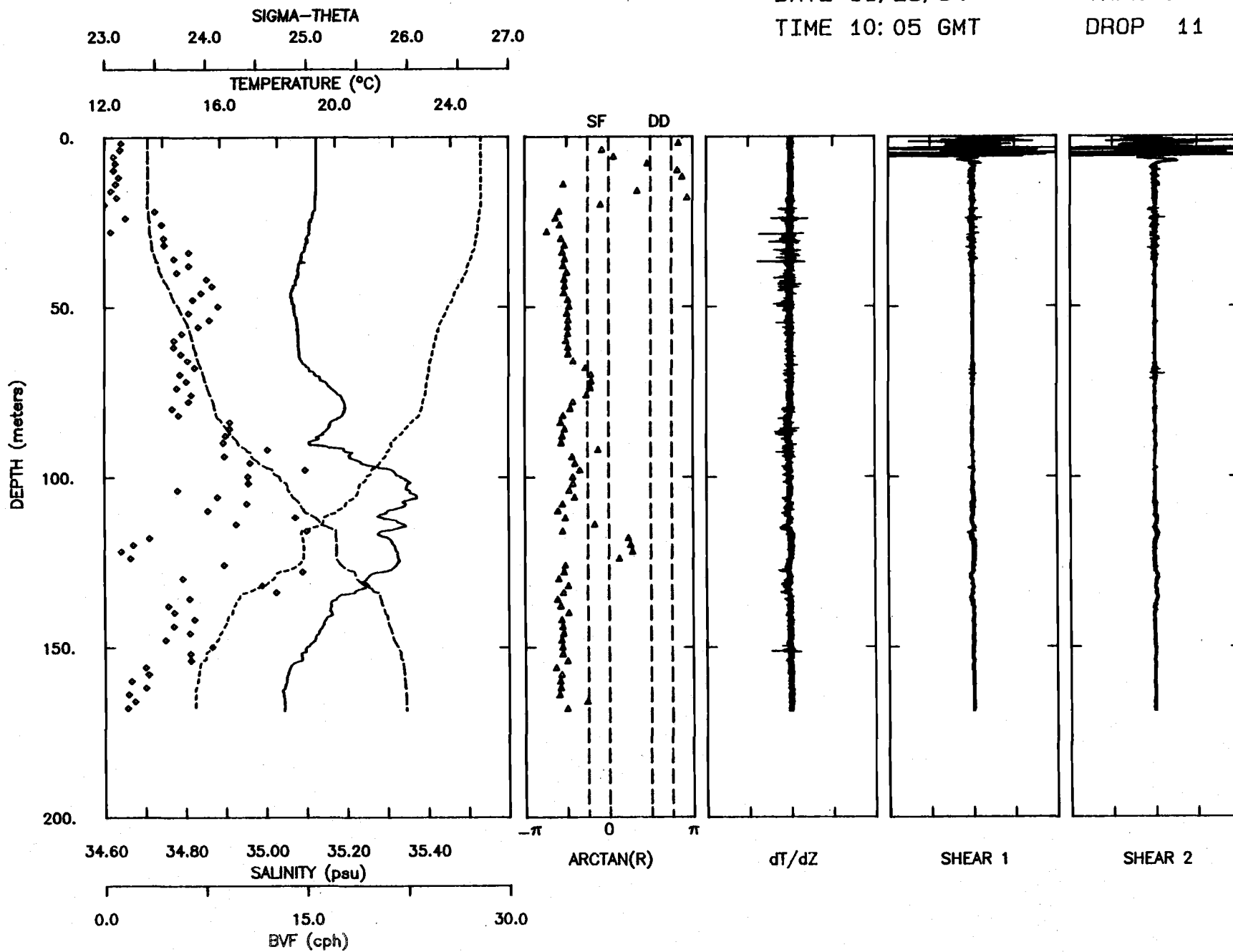


DATE 11/28/84

TAPE 148

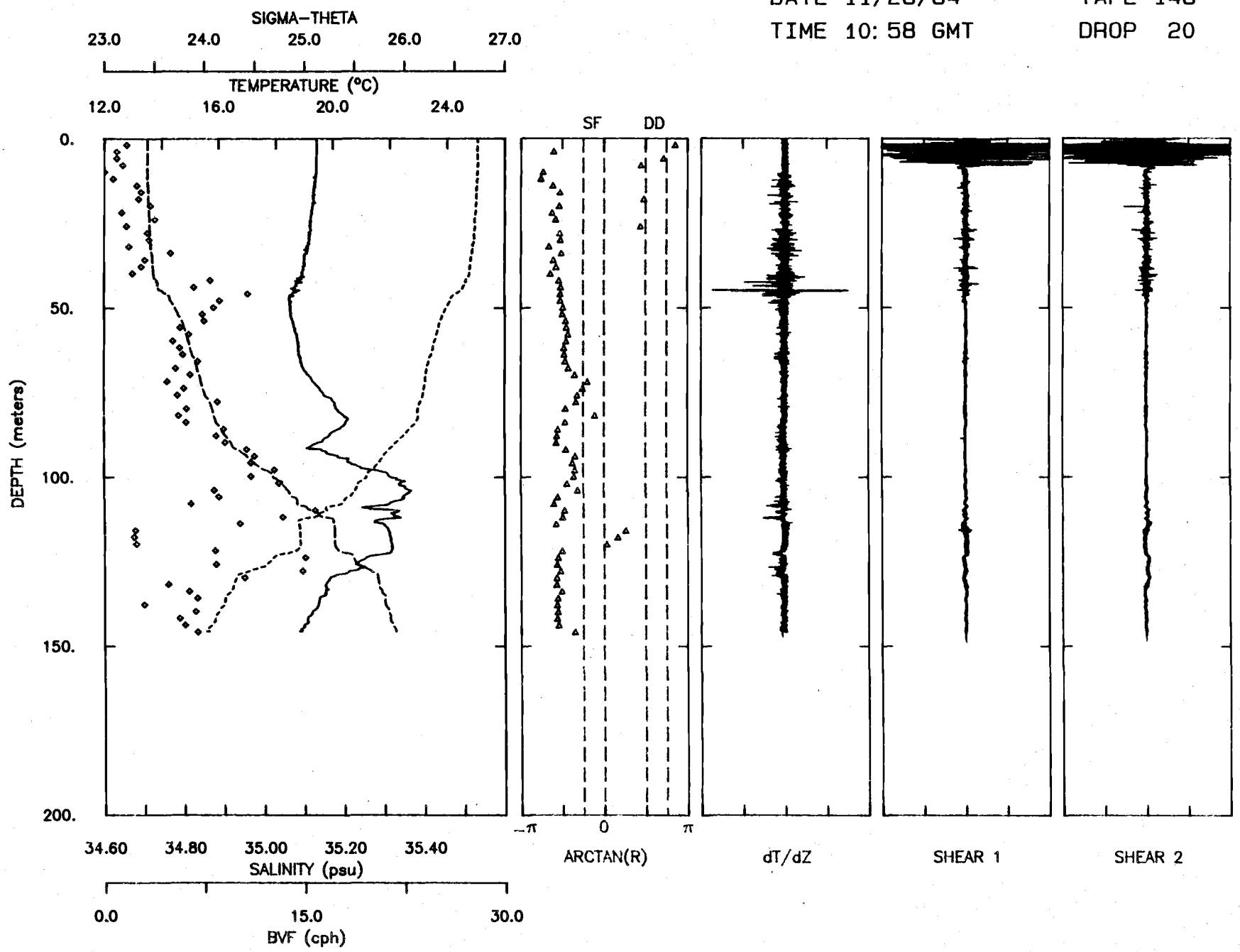
TIME 10:05 GMT

DROP 11



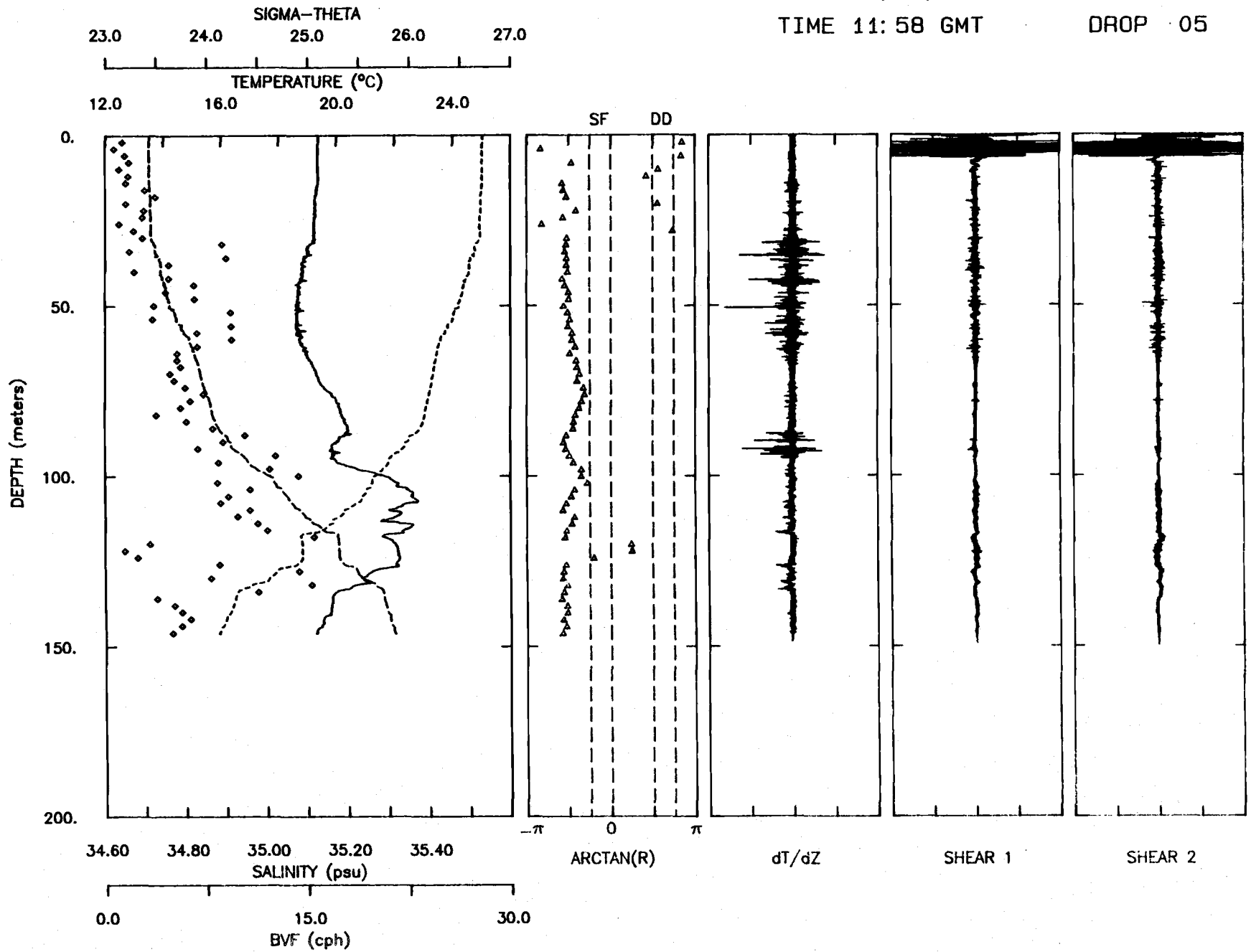
DATE 11/28/84
TIME 10:58 GMT

TAPE 148
DROP 20



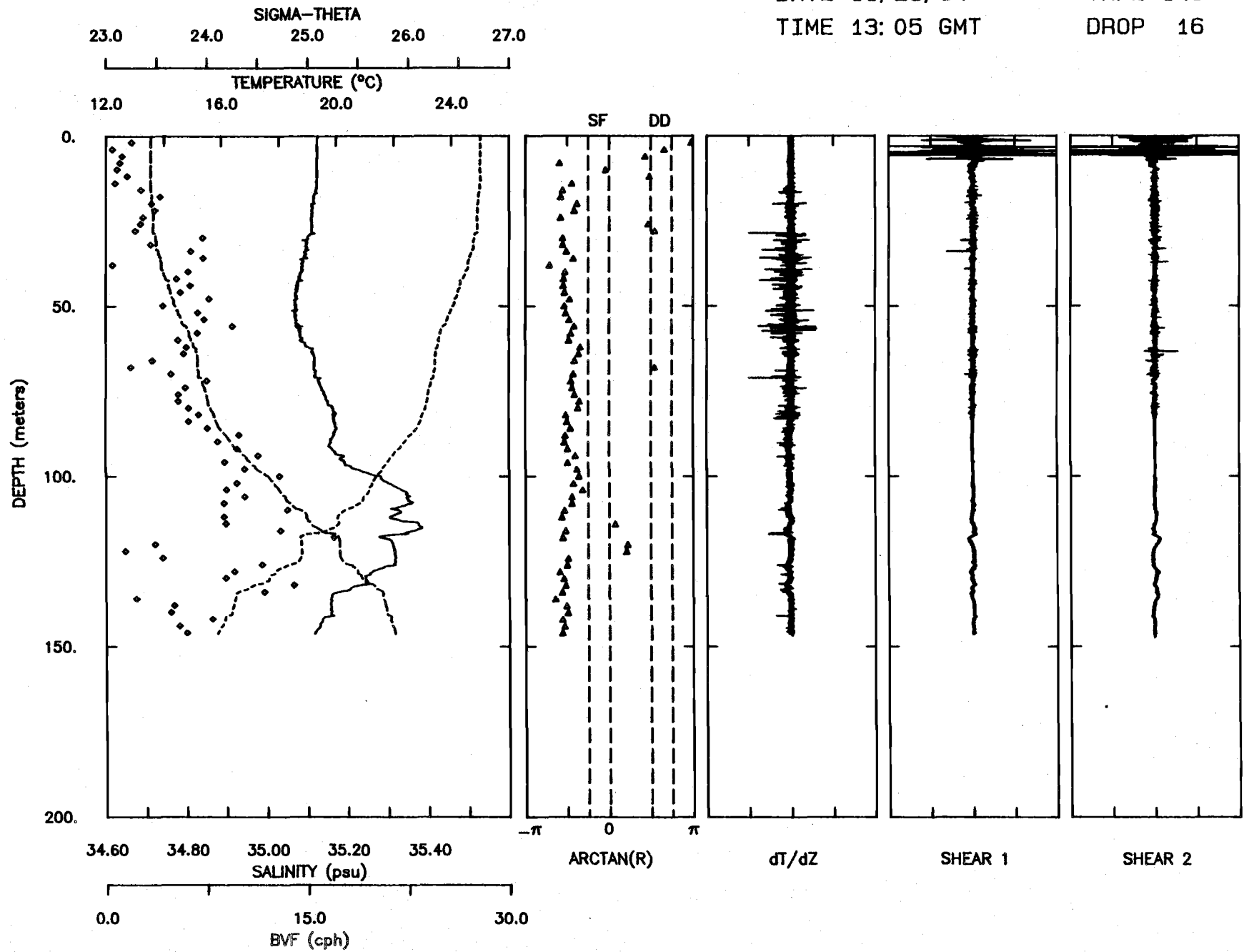
DATE 11/28/84
TIME 11:58 GMT

TAPE 149
DROP 05



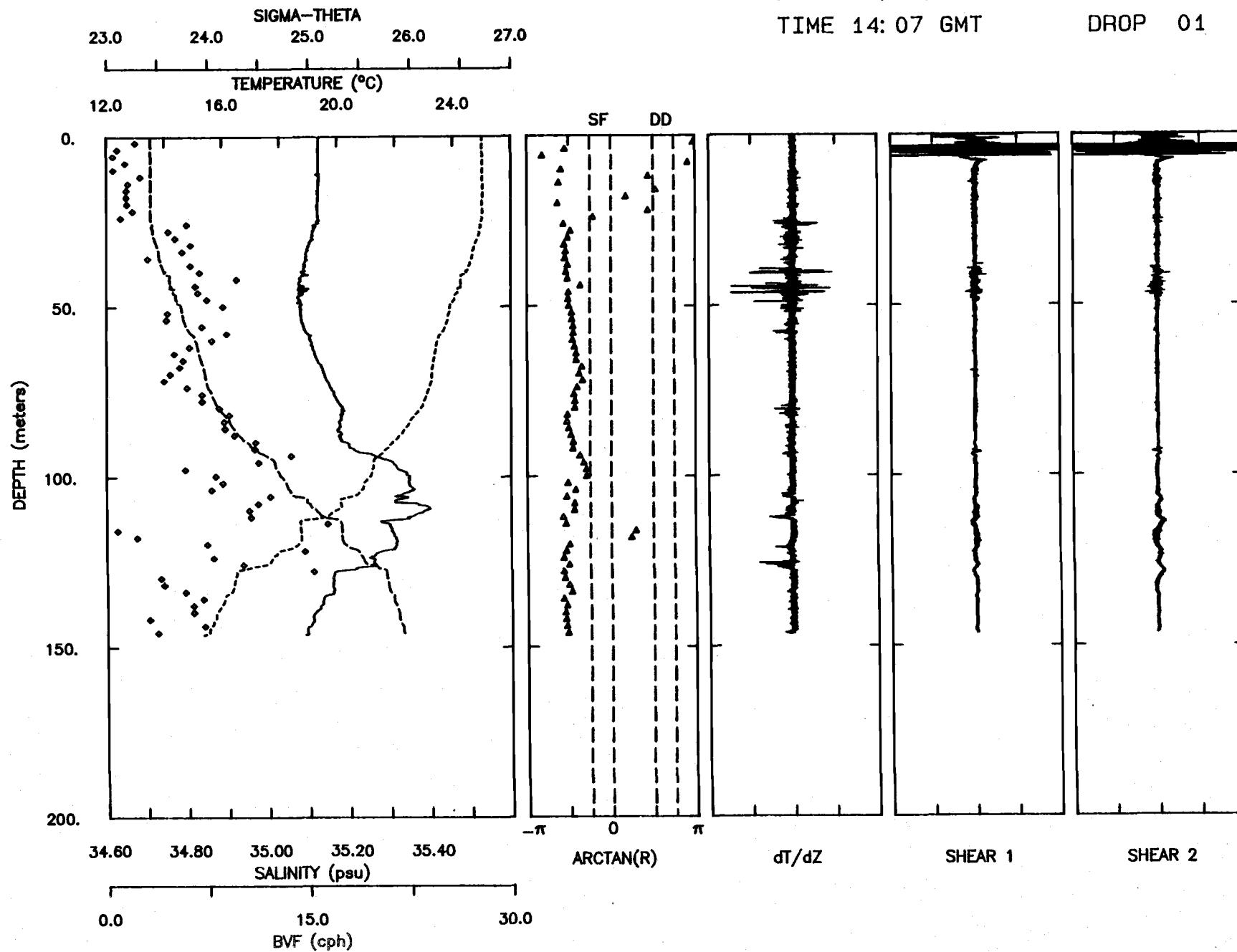
DATE 11/28/84
TIME 13:05 GMT

TAPE 149
DROP 16



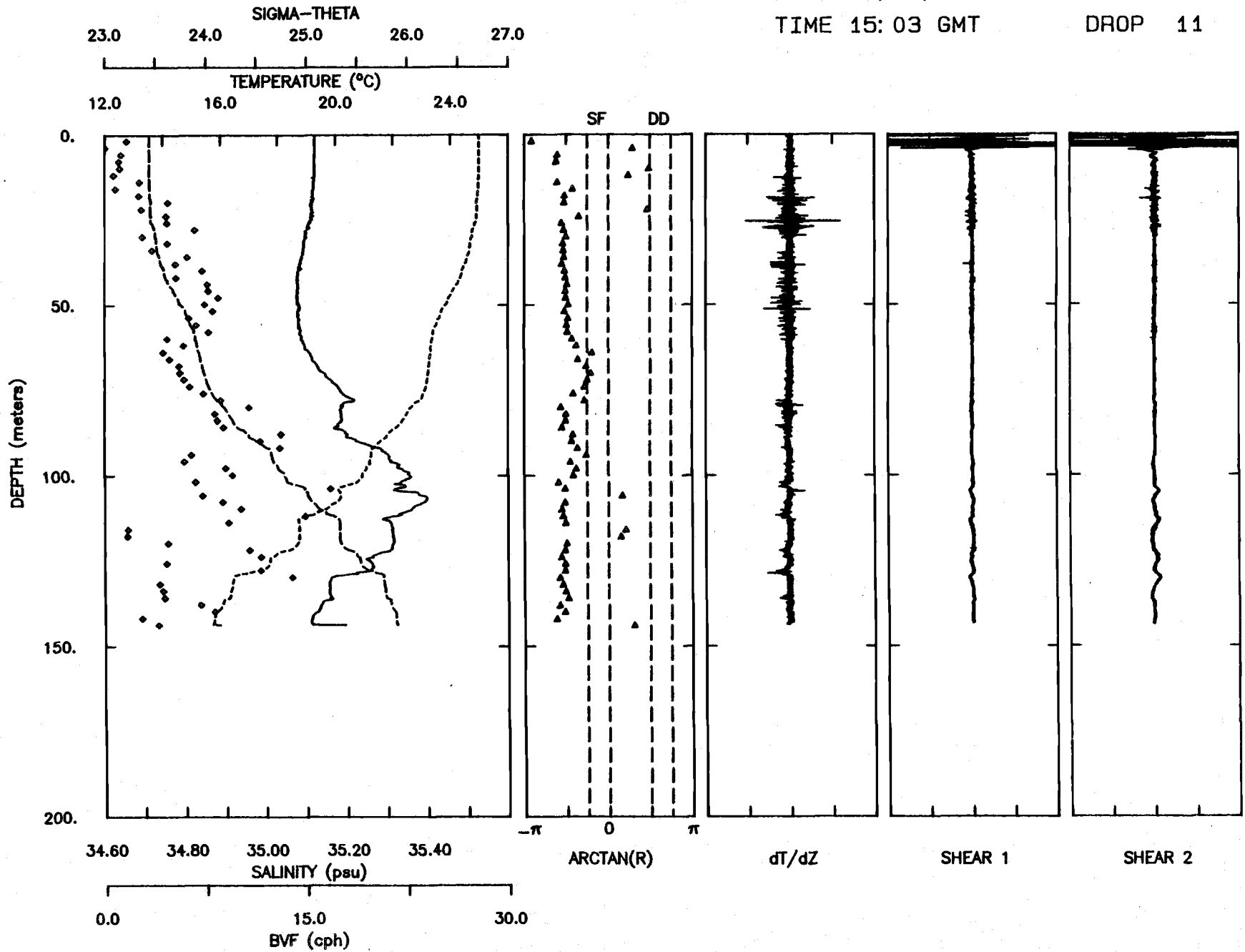
DATE 11/28/84
TIME 14:07 GMT

TAPE 150
DROP 01



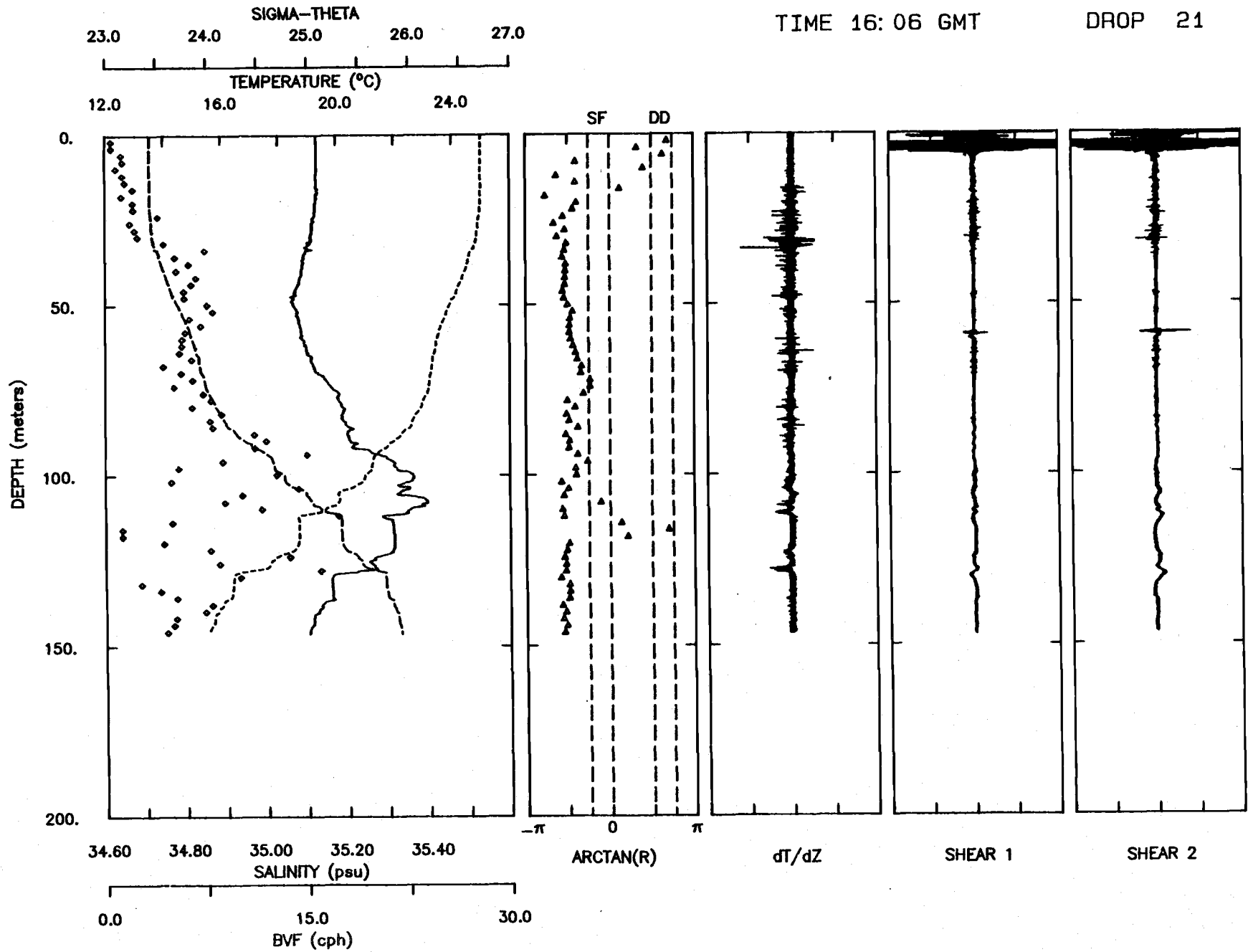
DATE 11/28/84
TIME 15: 03 GMT

TAPE 150
DROP 11



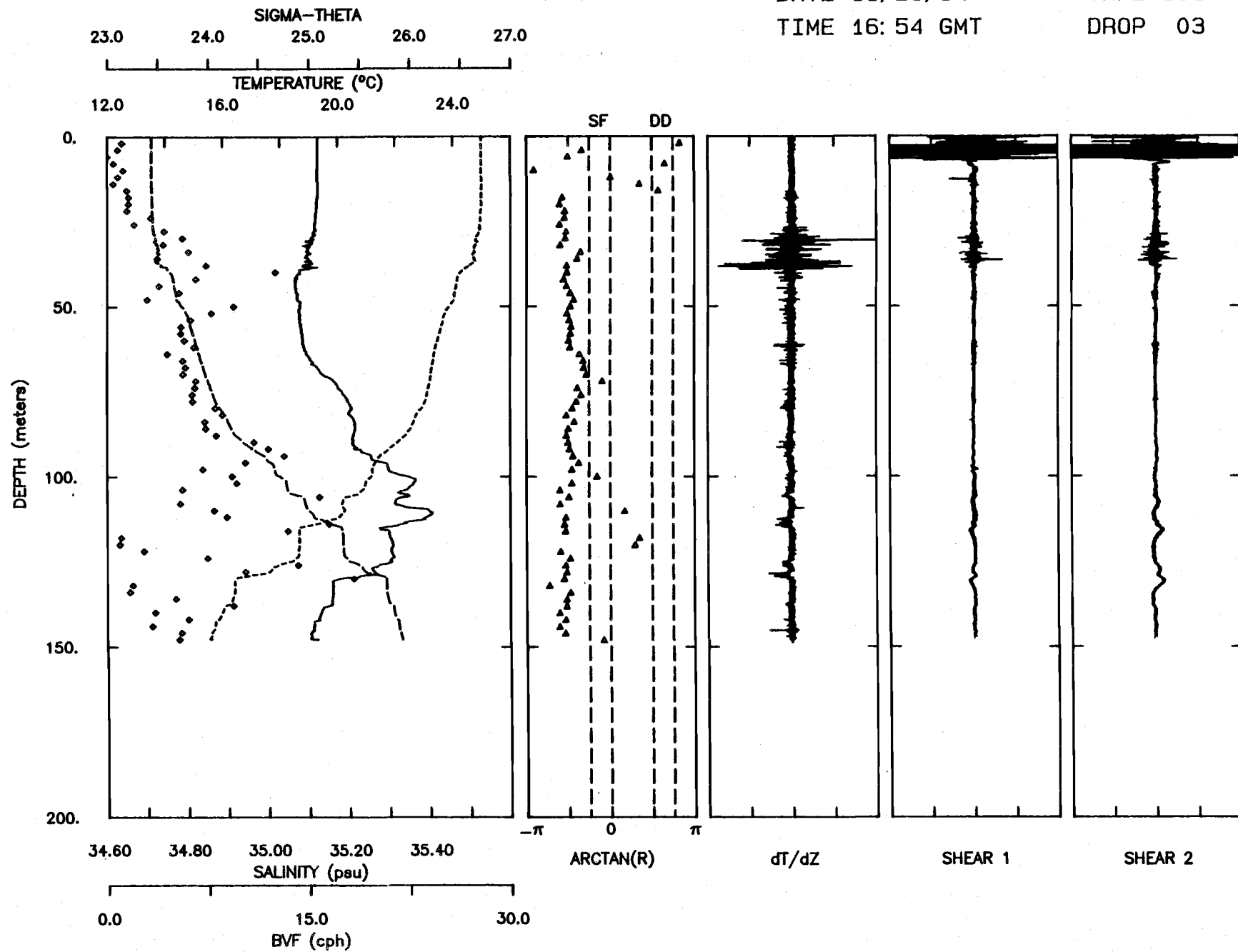
DATE 11/28/84
TIME 16:06 GMT

TAPE 150
DROP 21



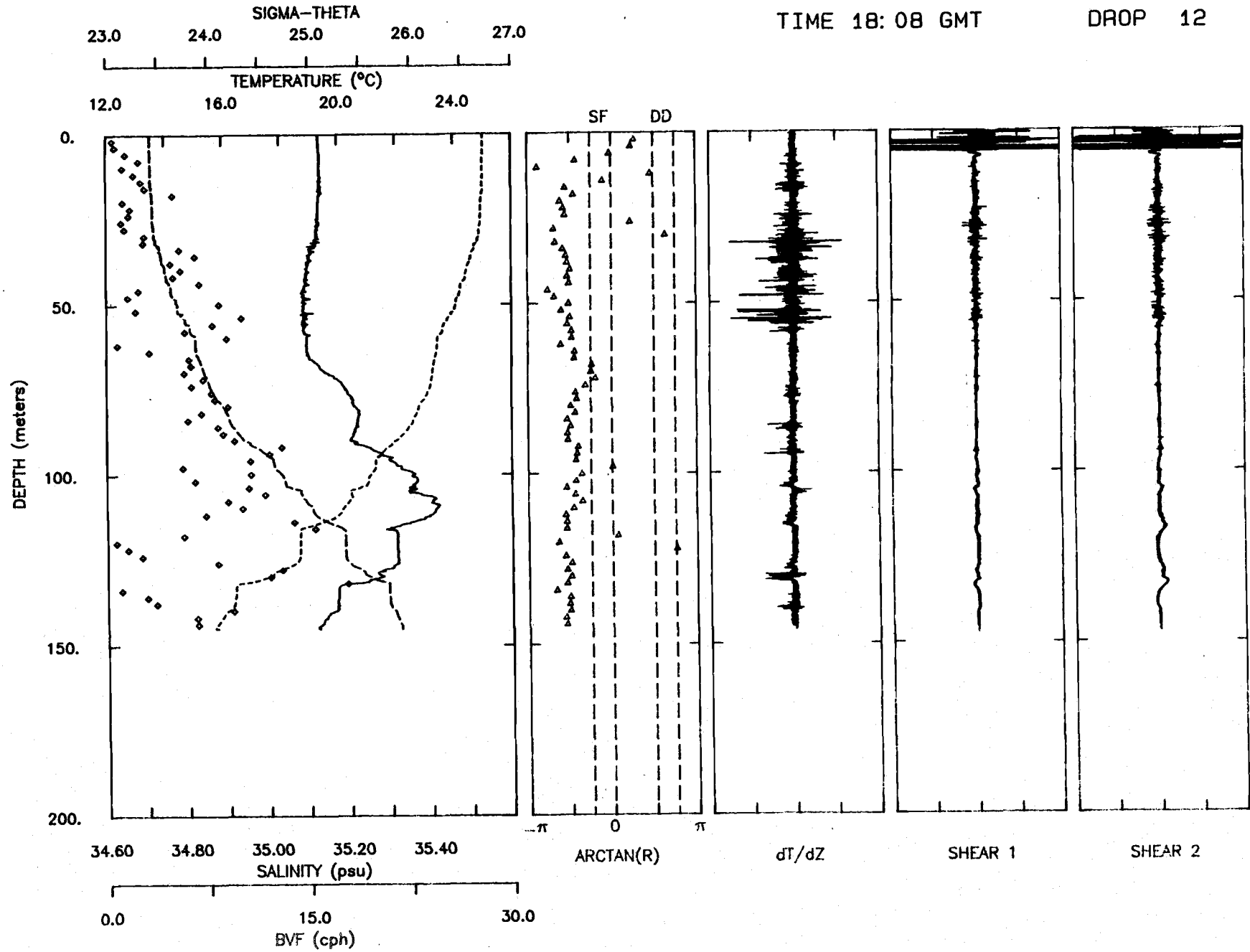
DATE 11/28/84
TIME 16:54 GMT

TAPE 151
DROP 03



DATE 11/28/84
TIME 18: 08 GMT

TAPE 151
DROP 12

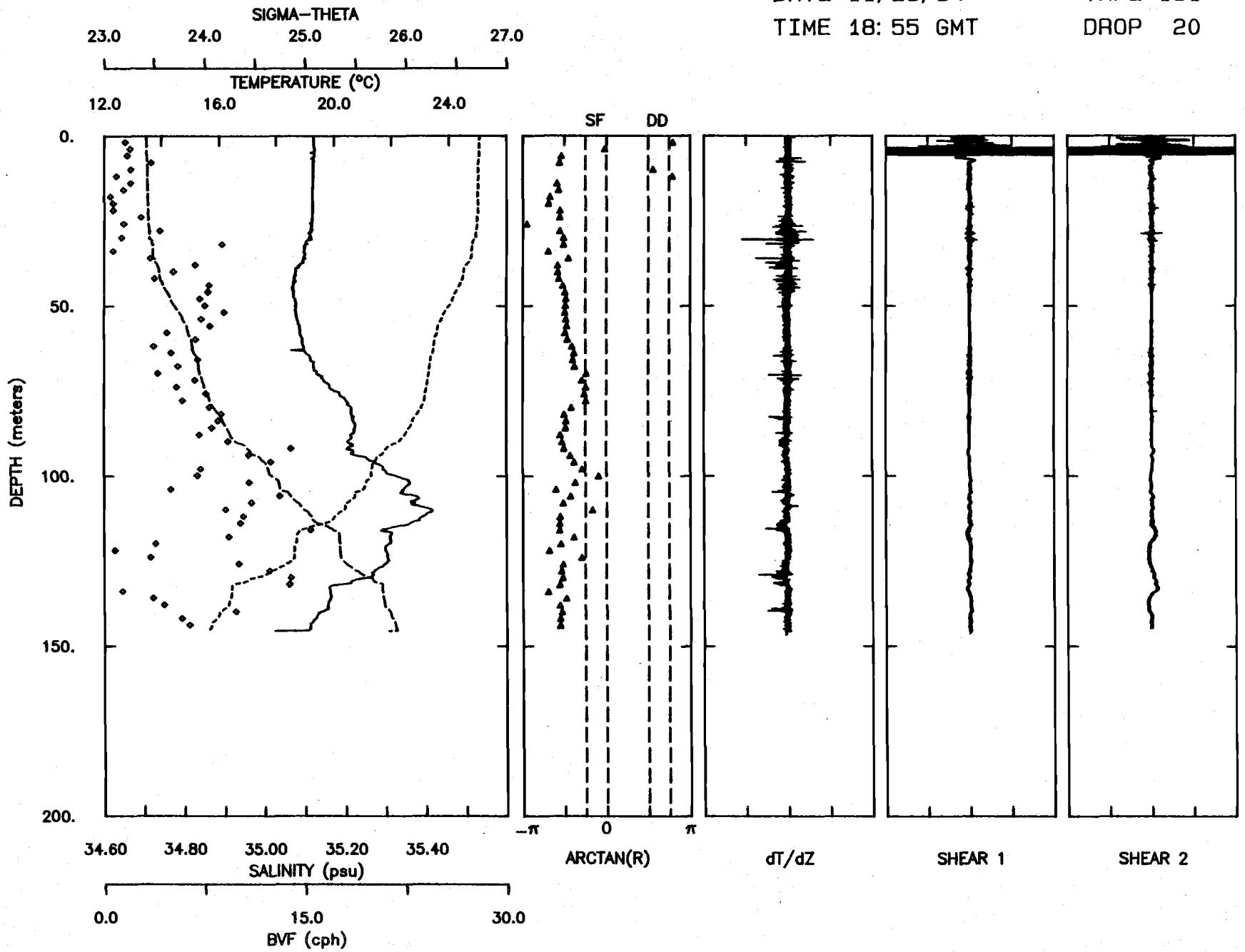


DATE 11/28/84

TAPE 151

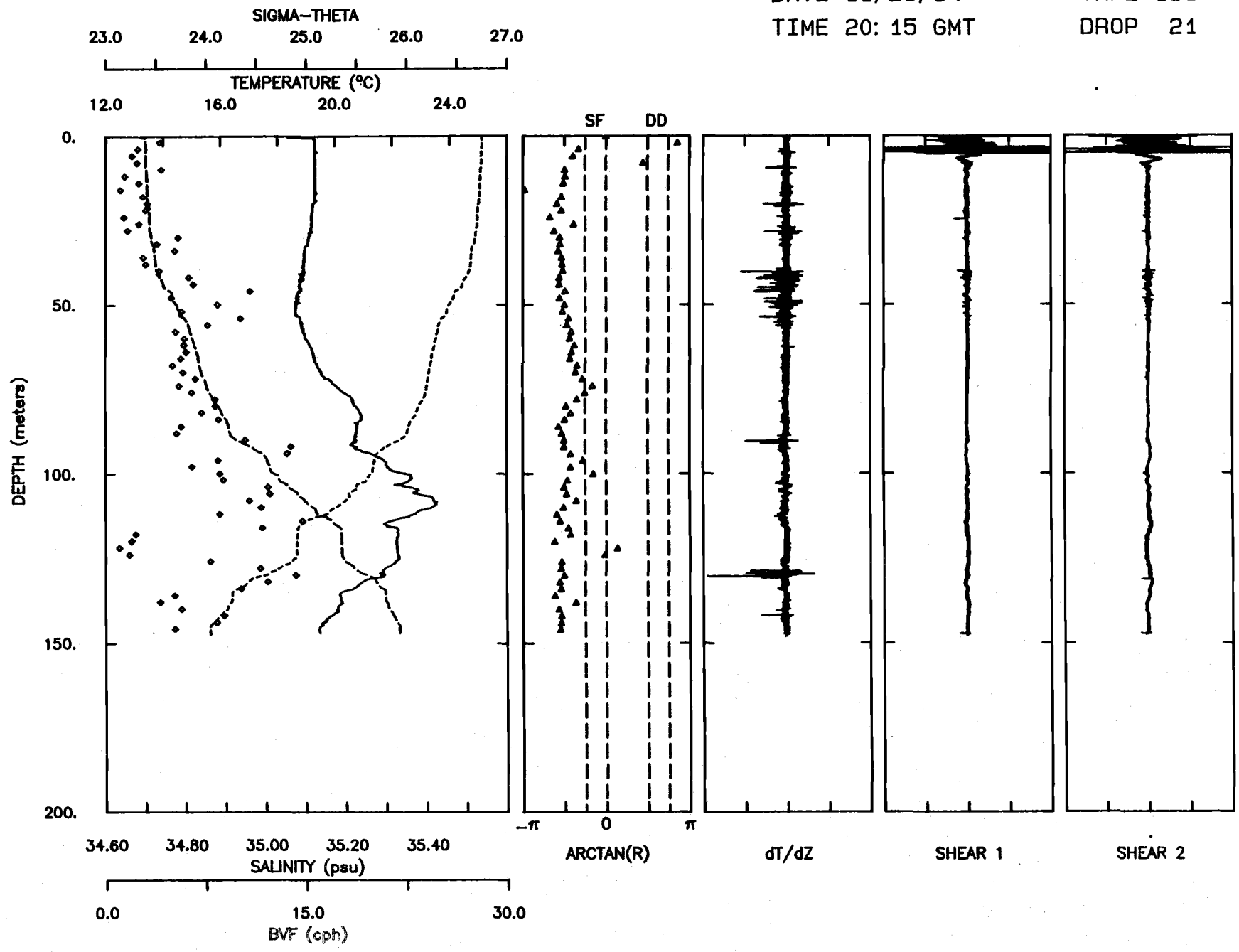
TIME 18:55 GMT

DROP 20



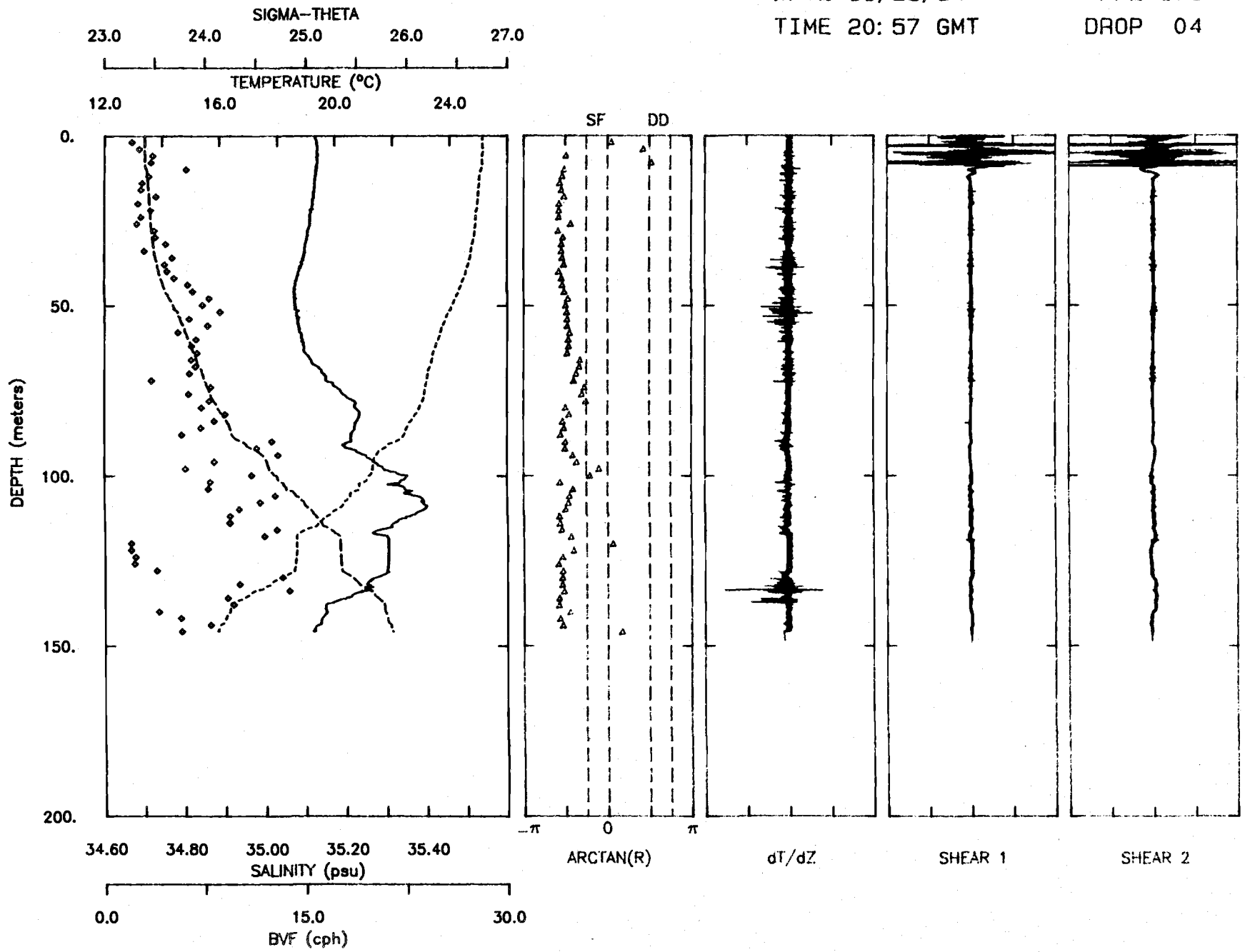
DATE 11/28/84
TIME 20:15 GMT

TAPE 151
DROP 21



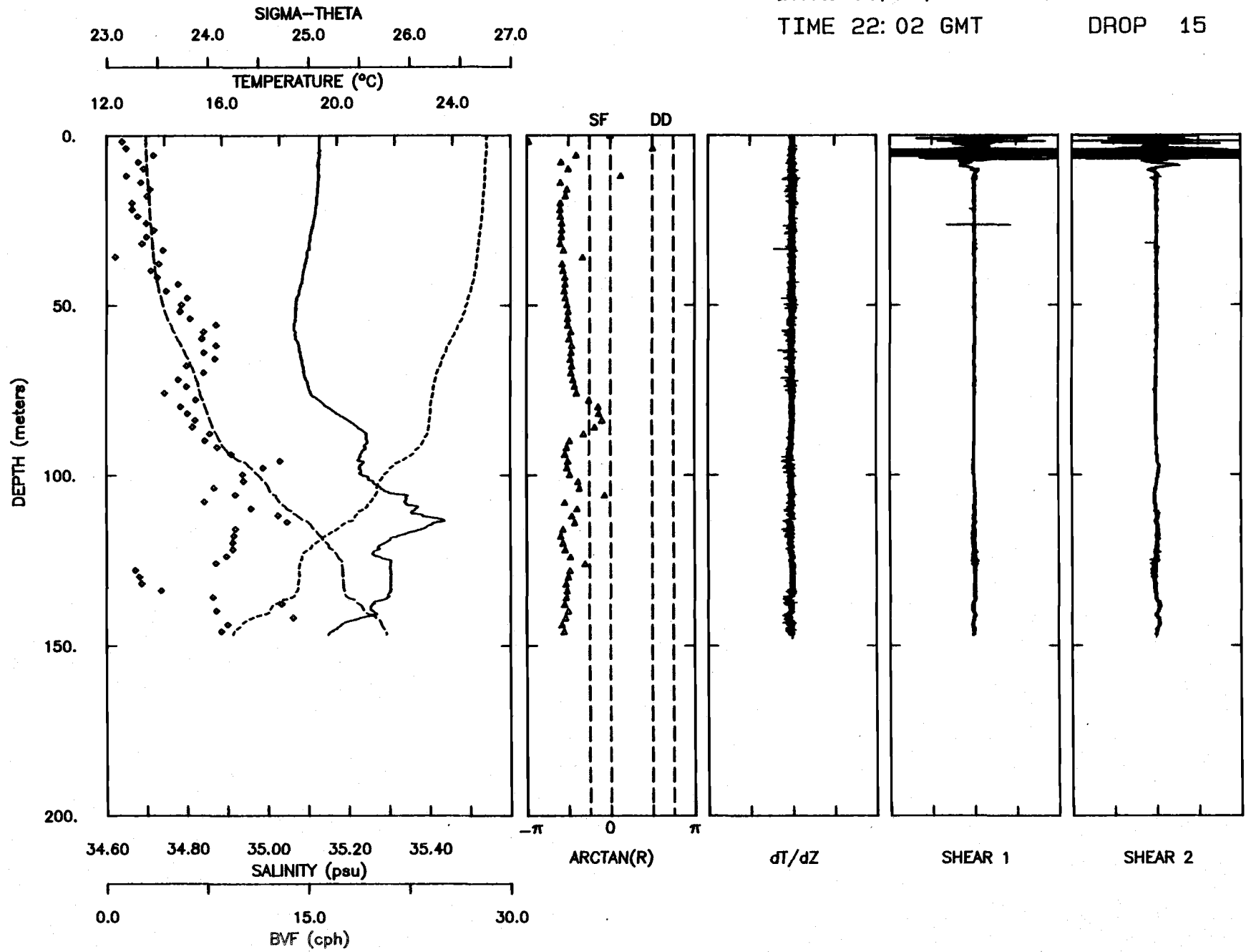
DATE 11/28/84
TIME 20:57 GMT

TAPE 152
DROP 04



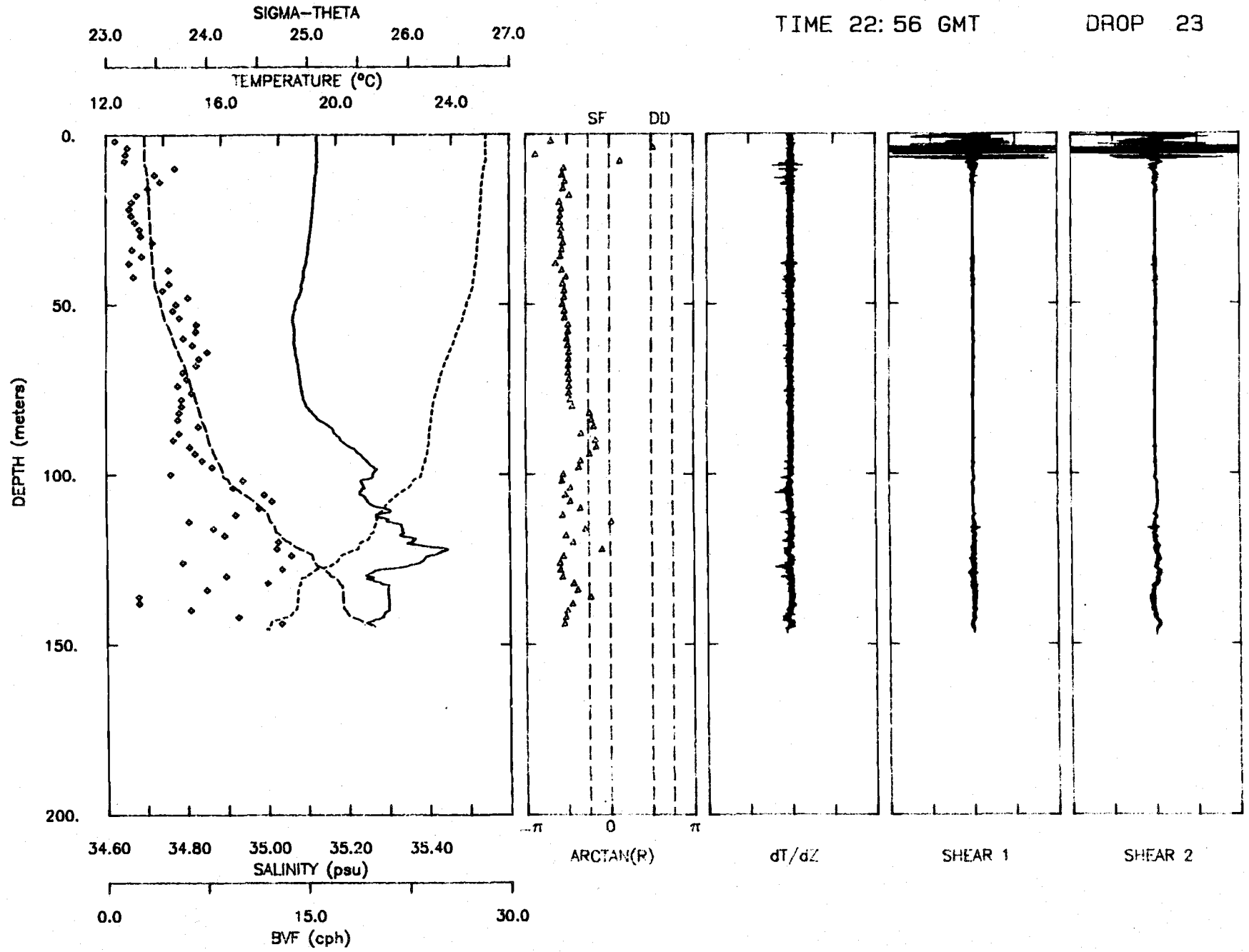
DATE 11/28/84
TIME 22:02 GMT

TAPE 152
DROP 15



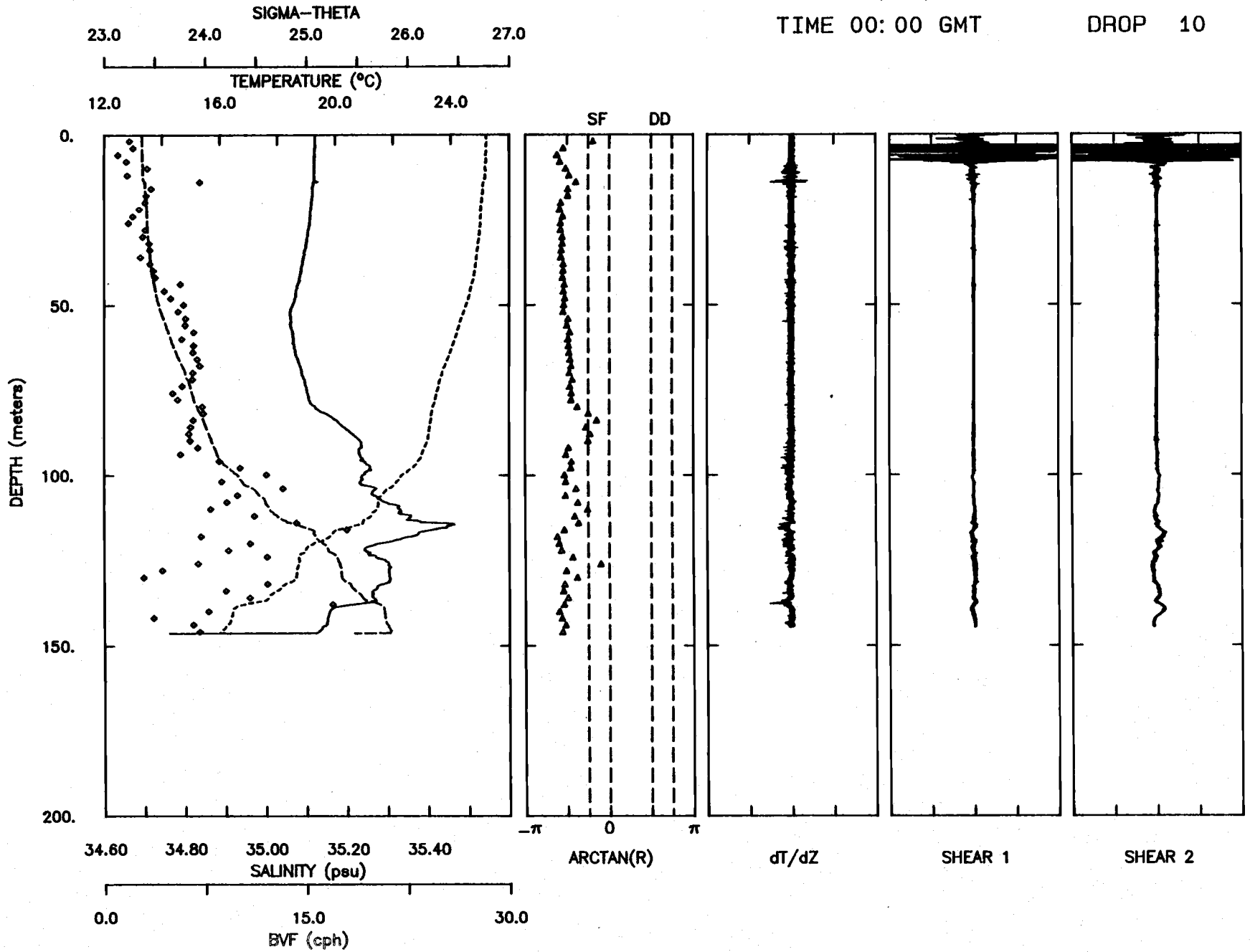
DATE 11/28/84
TIME 22:56 GMT

TAPE 152
DROP 23



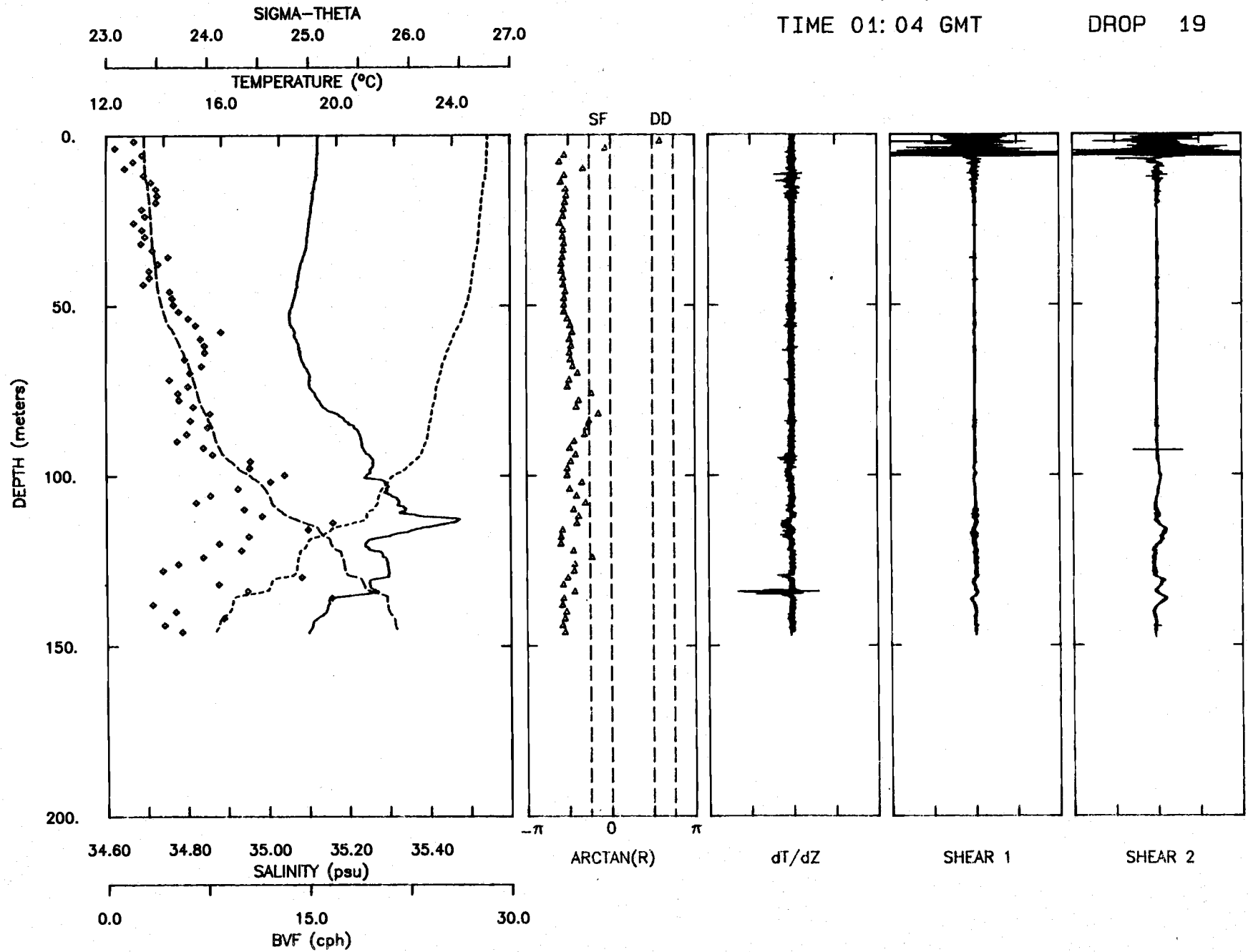
DATE 11/29/84
TIME 00:00 GMT

TAPE 153
DROP 10



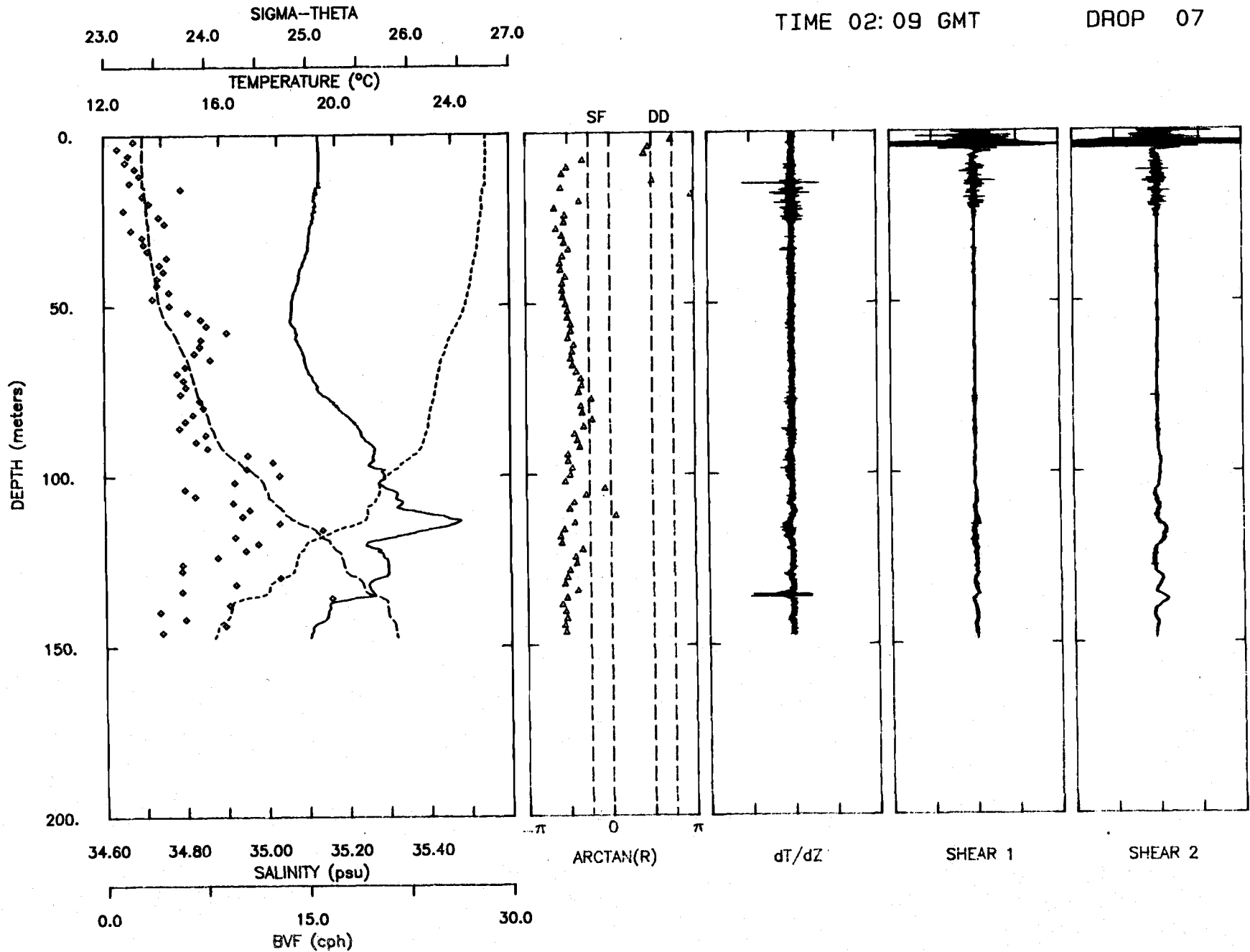
DATE 11/29/84
TIME 01:04 GMT

TAPE 153
DROP 19



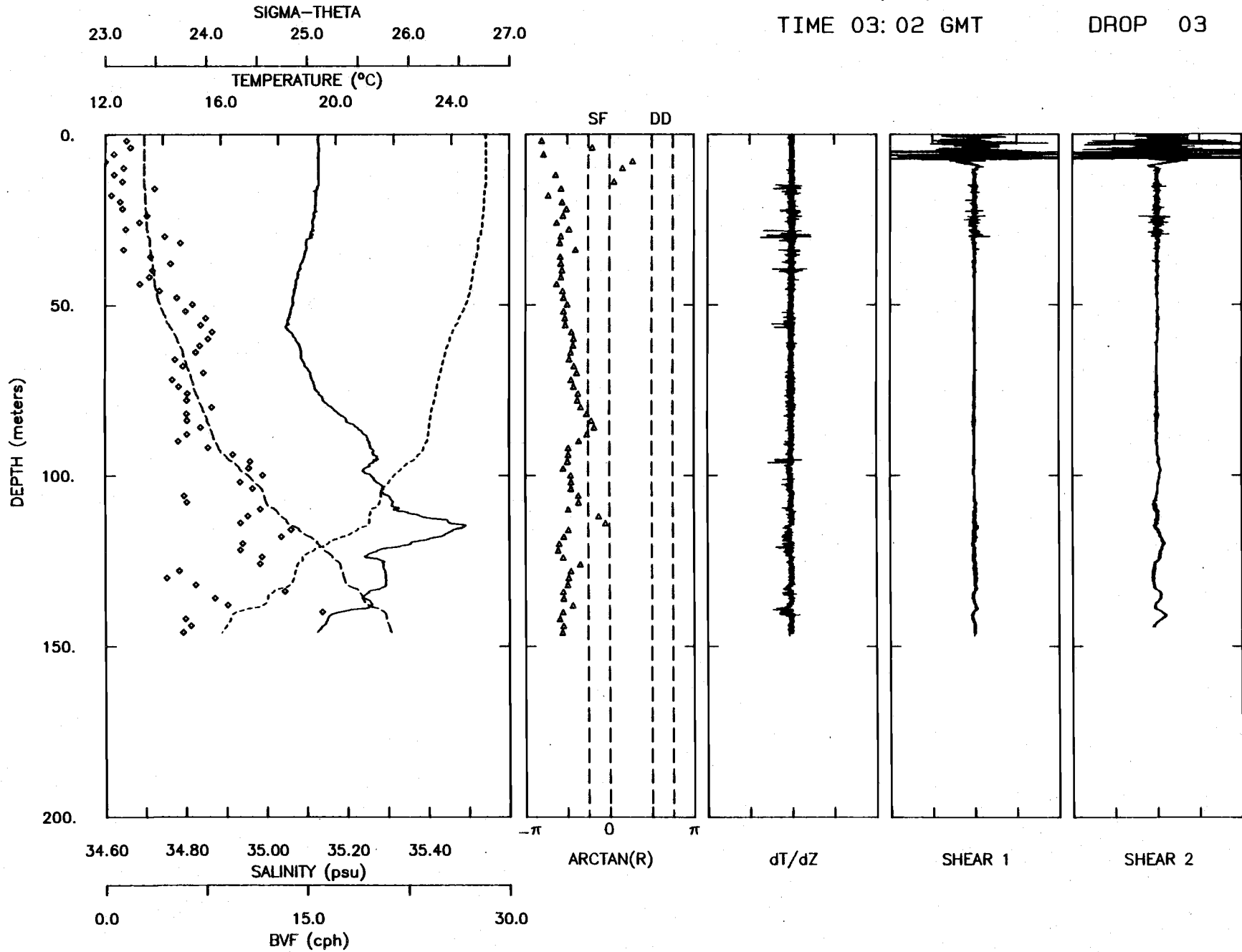
DATE 11/29/84
TIME 02:09 GMT

TAPE 154
DROP 07



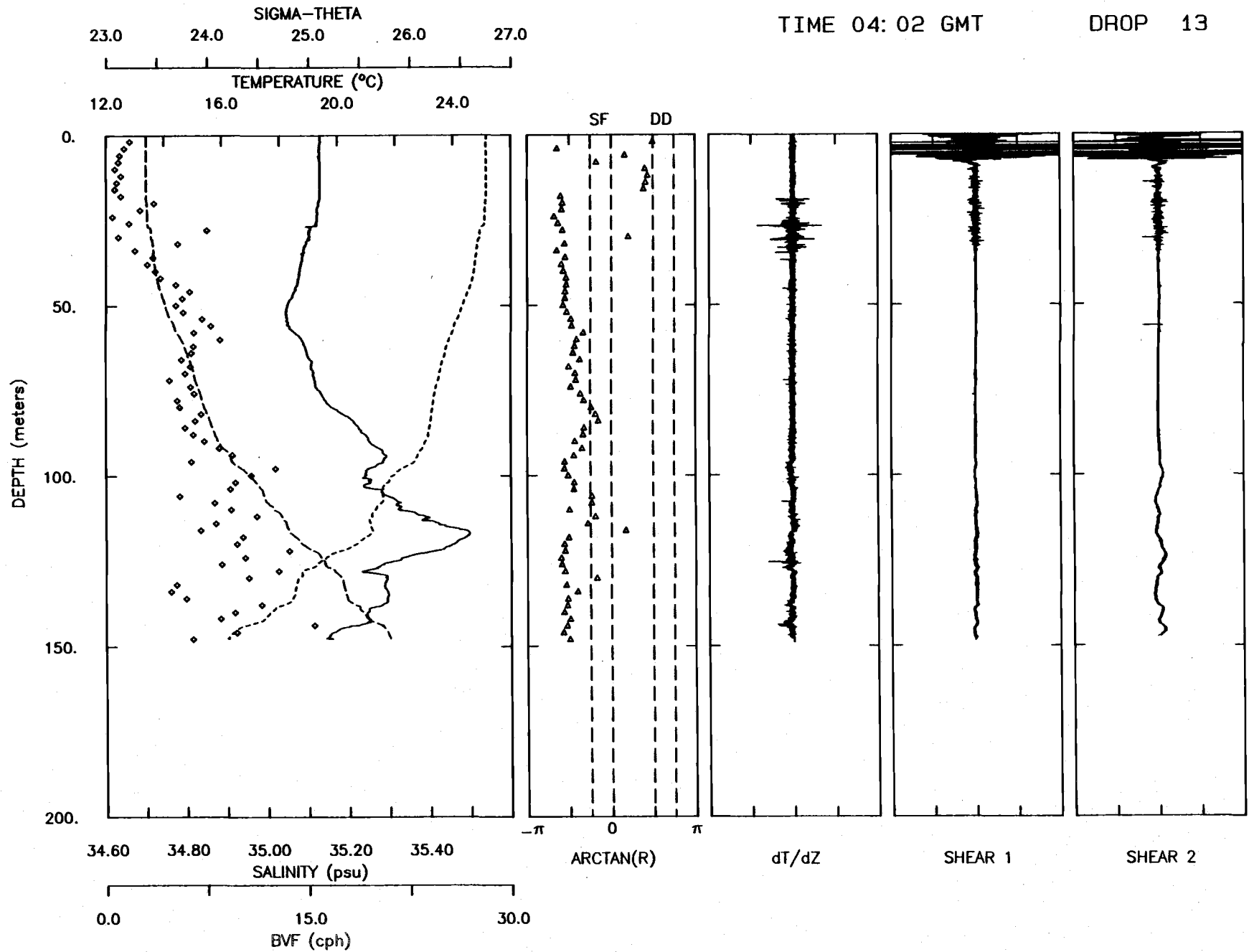
DATE 11/29/84
TIME 03:02 GMT

TAPE 155
DROP 03



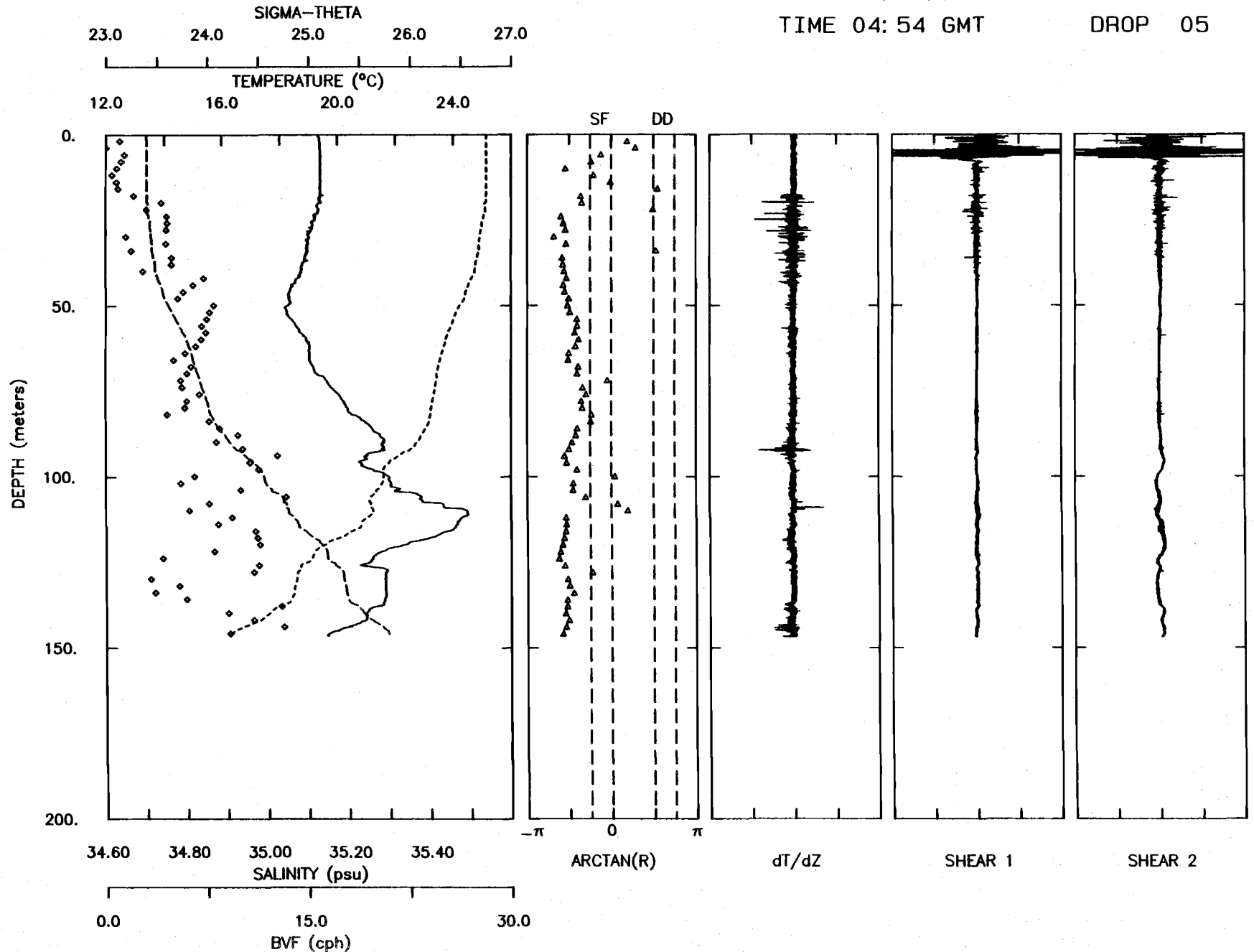
DATE 11/29/84
TIME 04:02 GMT

TAPE 155
DROP 13



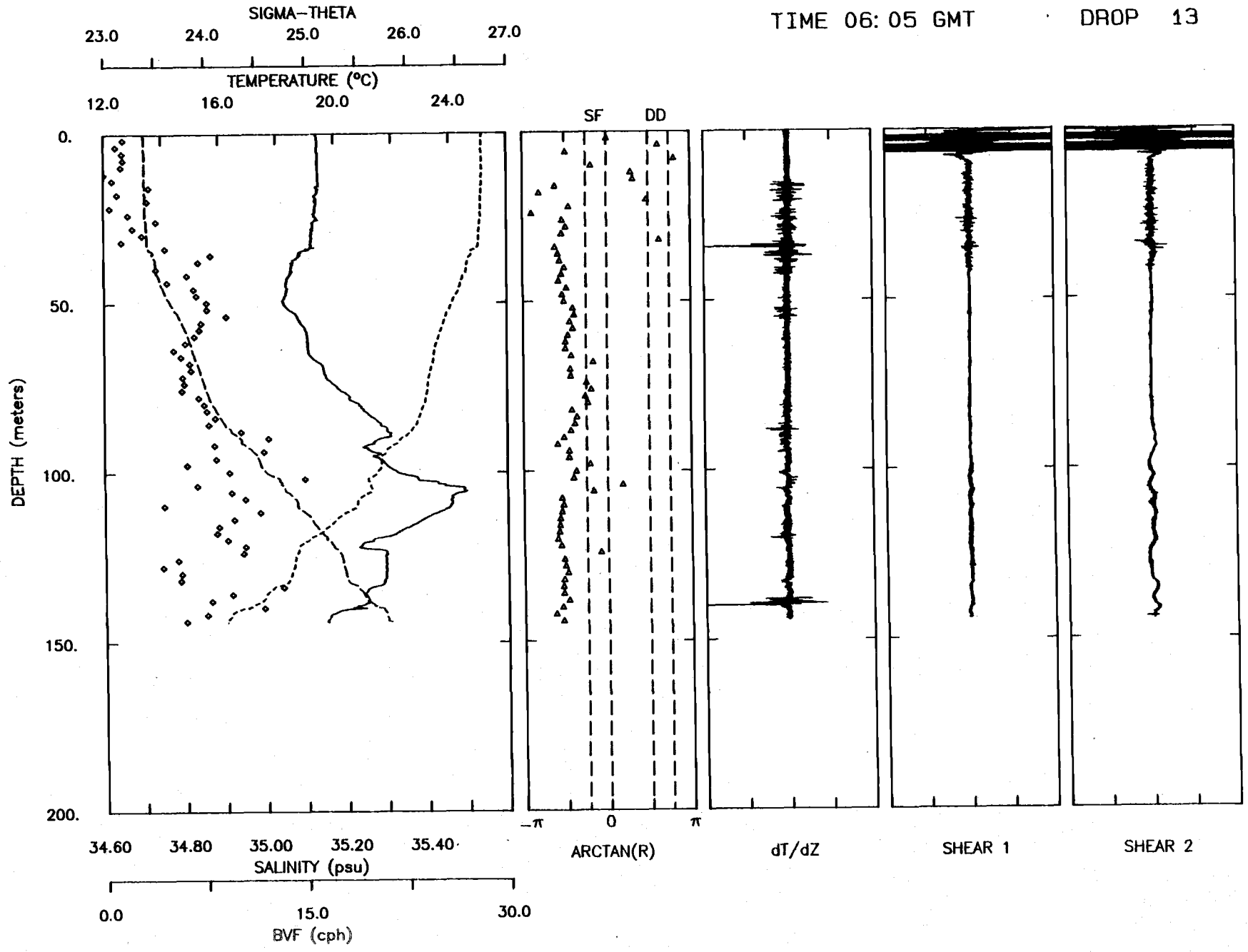
DATE 11/29/84
TIME 04:54 GMT

TAPE 156
DROP 05



DATE 11/29/84
TIME 06:05 GMT

TAPE 156
DROP 13

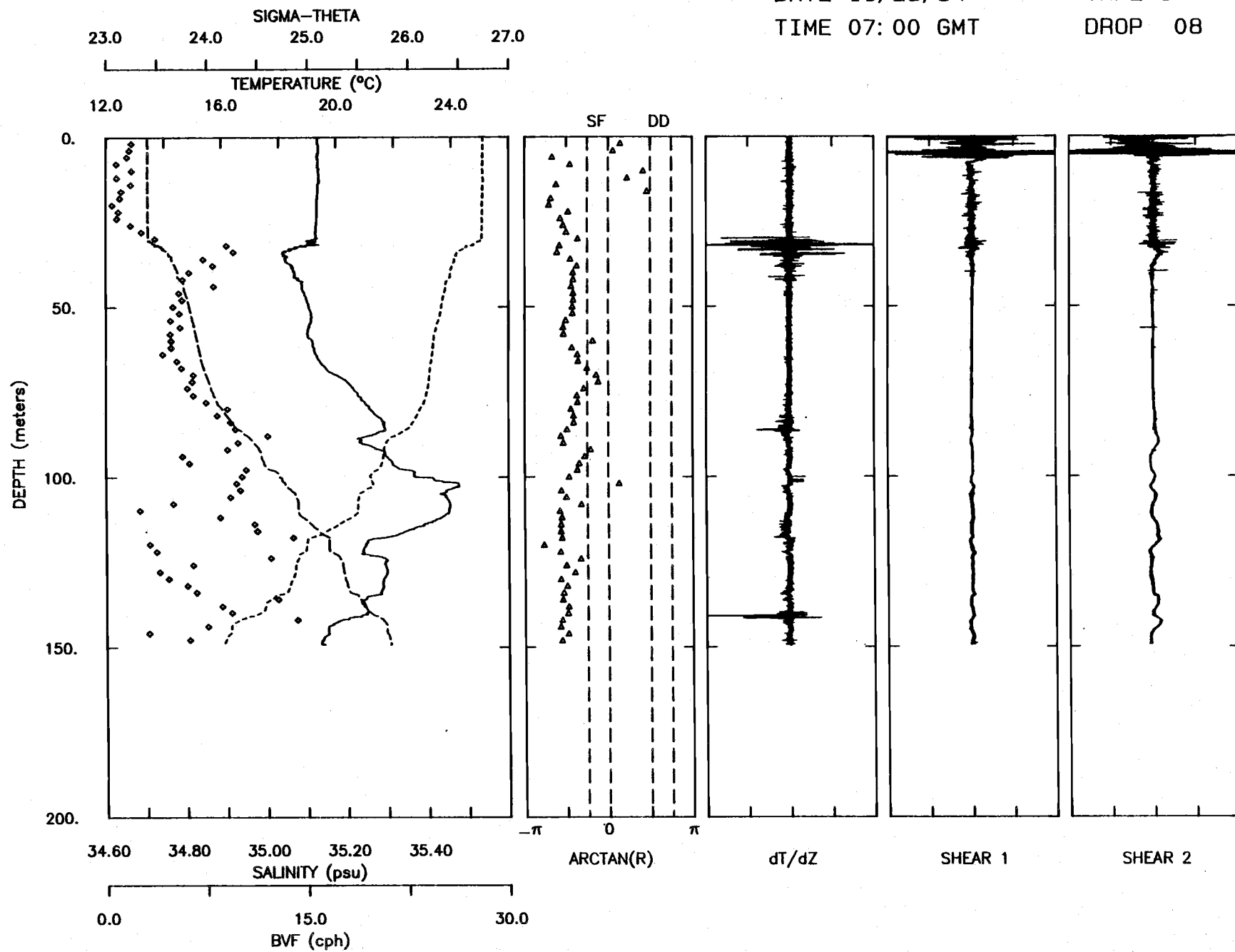


DATE 11/29/84

TAPE 157

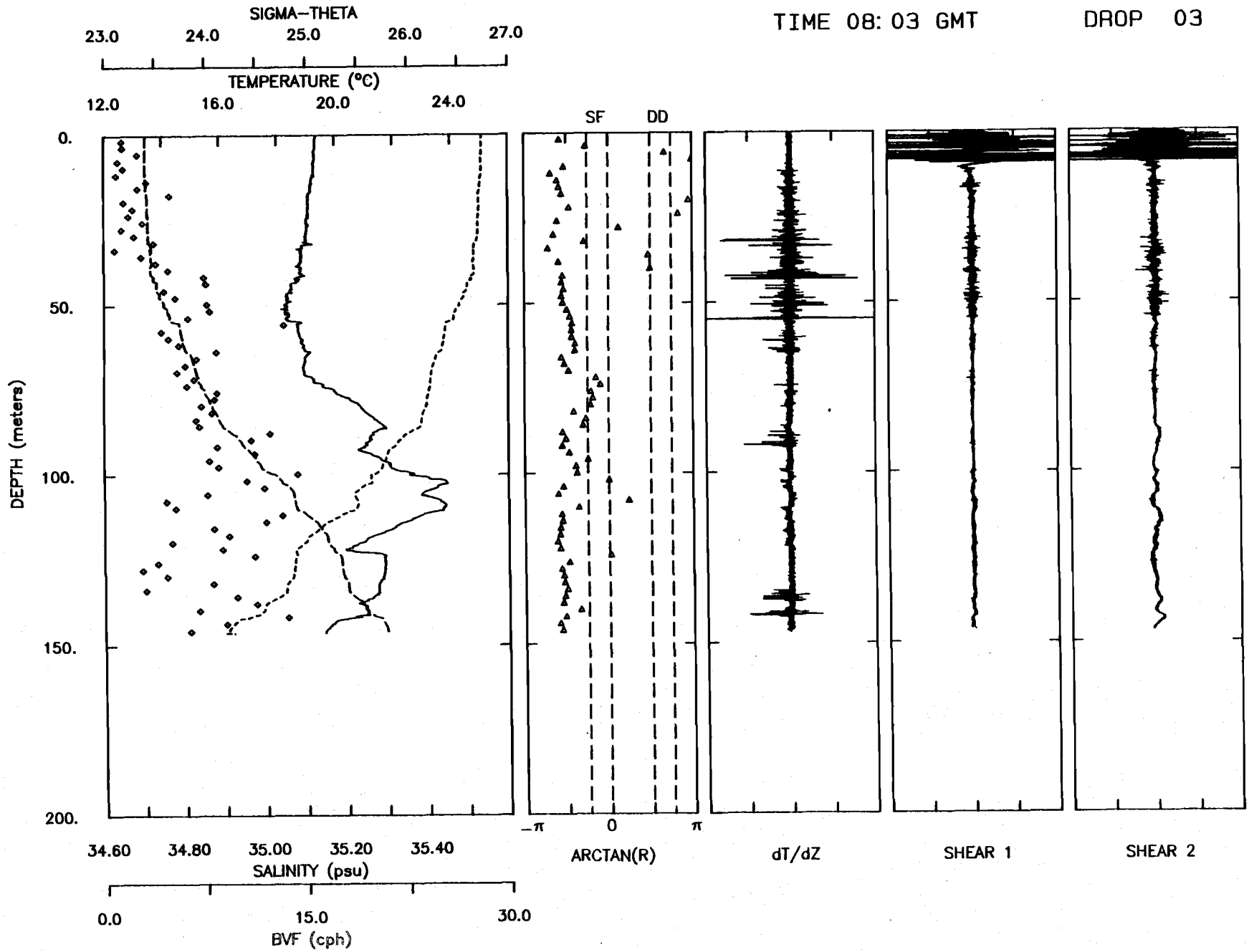
TIME 07:00 GMT

DROP 08



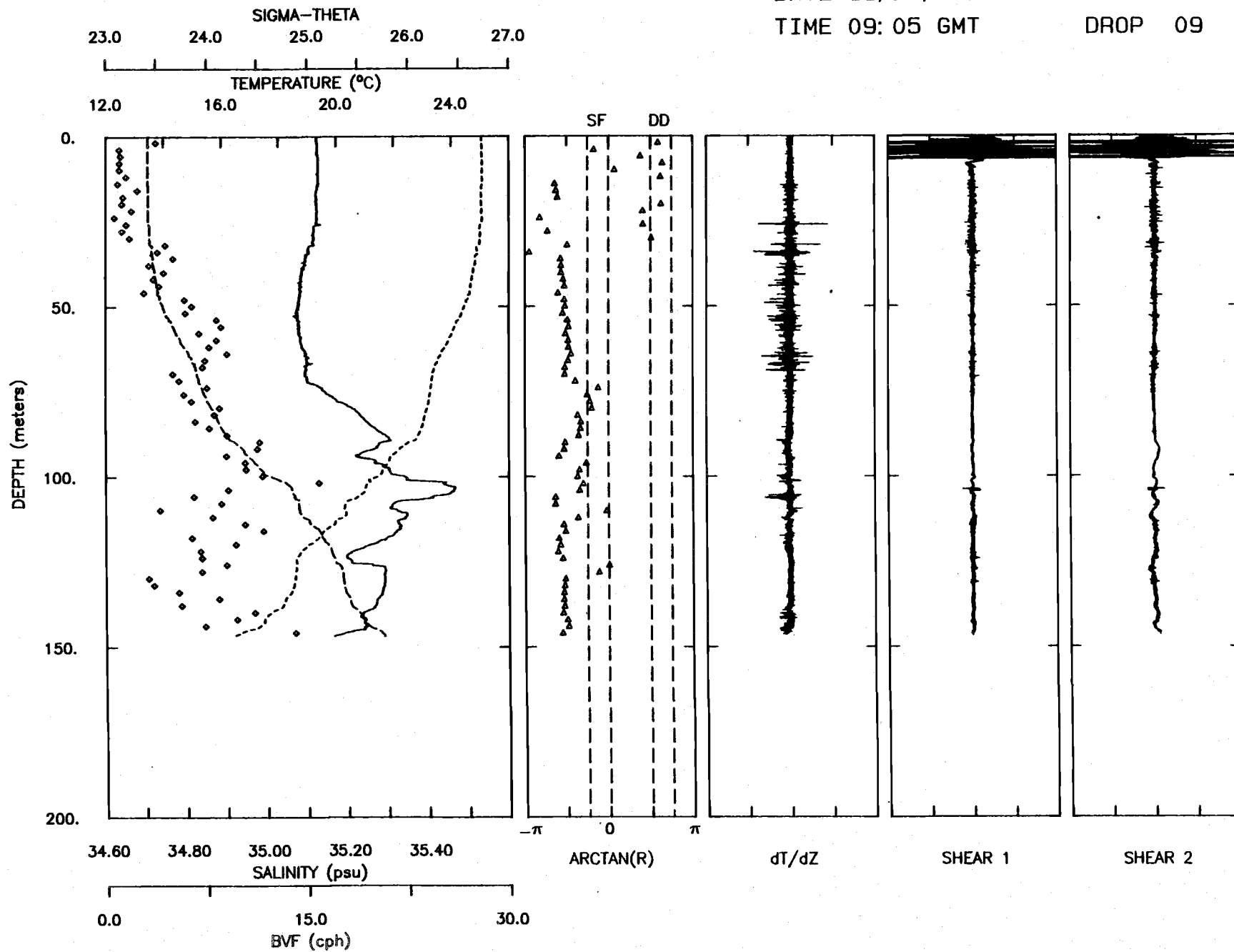
DATE 11/29/84
TIME 08:03 GMT

TAPE 158
DROP 03



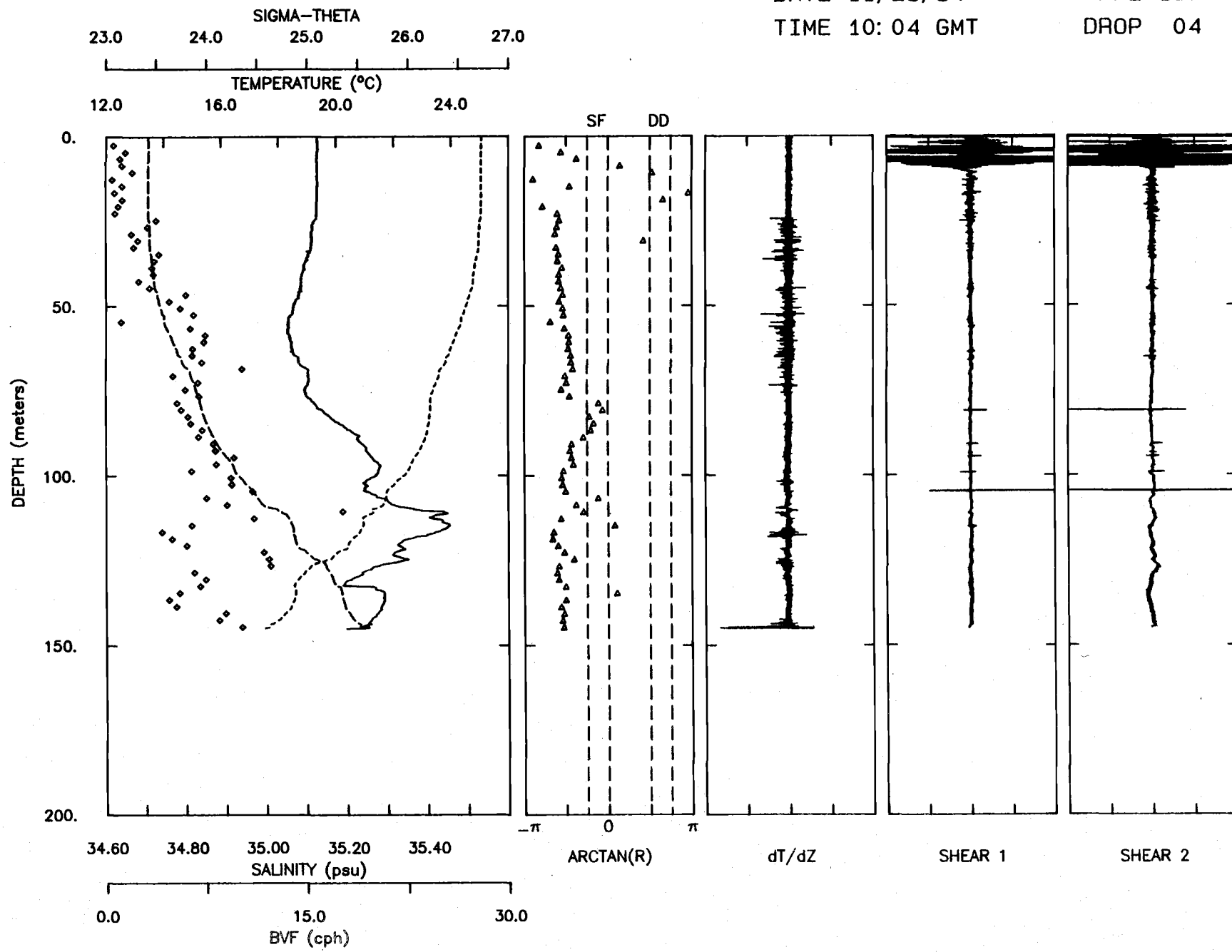
DATE 11/29/84
TIME 09:05 GMT

TAPE 158
DROP 09



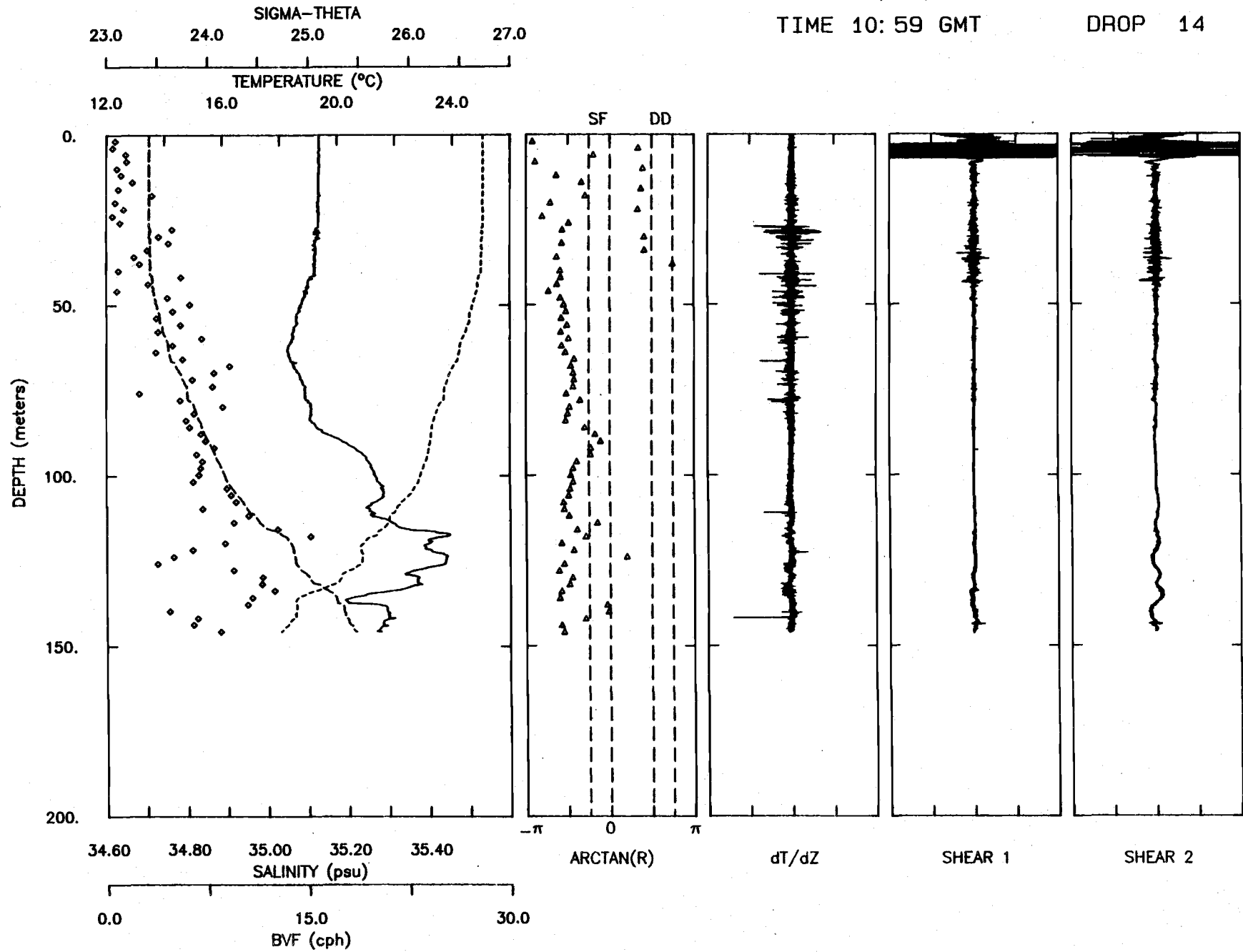
DATE 11/29/84
TIME 10:04 GMT

TAPE 159
DROP 04



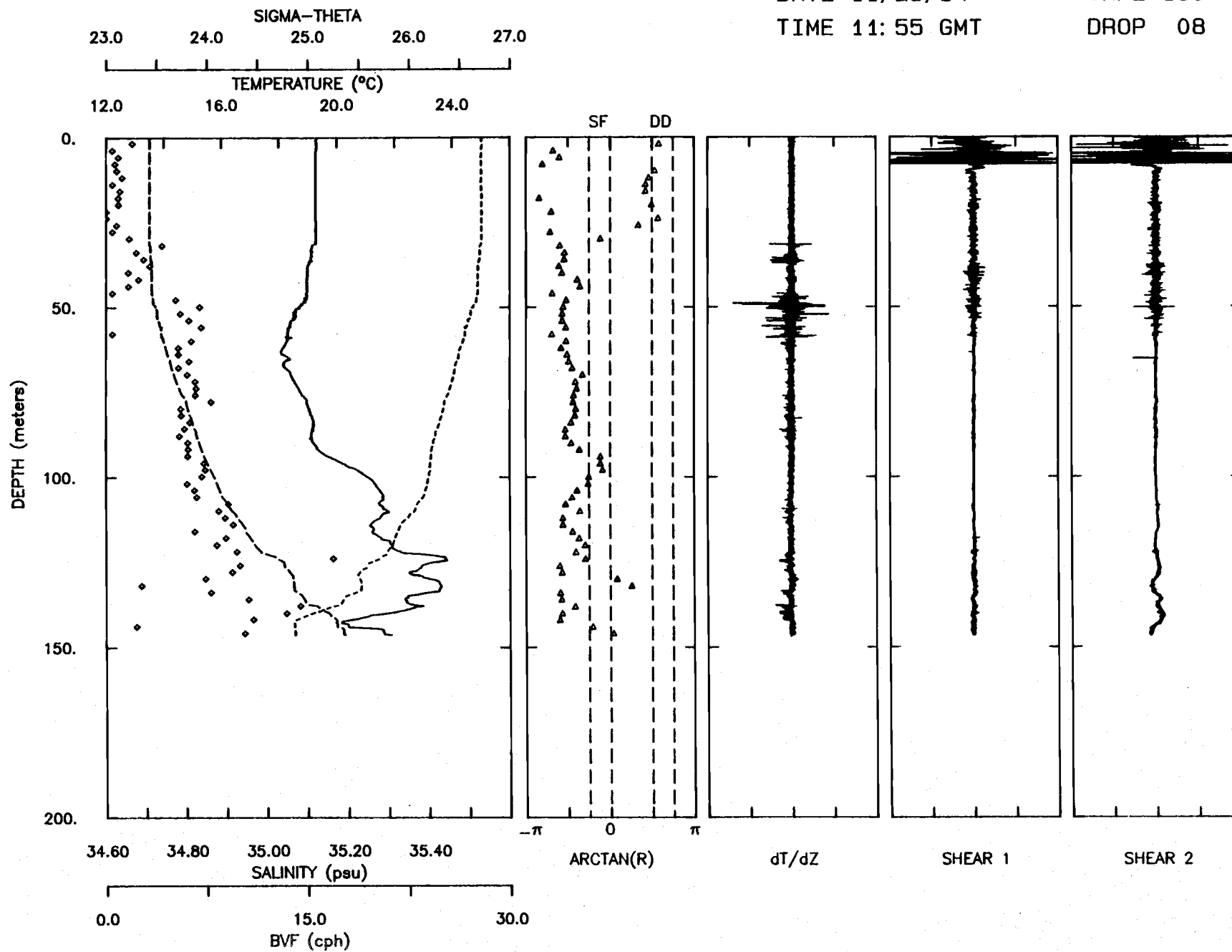
DATE 11/29/84
TIME 10:59 GMT

TAPE 159
DROP 14



DATE 11/29/84
TIME 11:55 GMT

TAPE 160
DROP 08

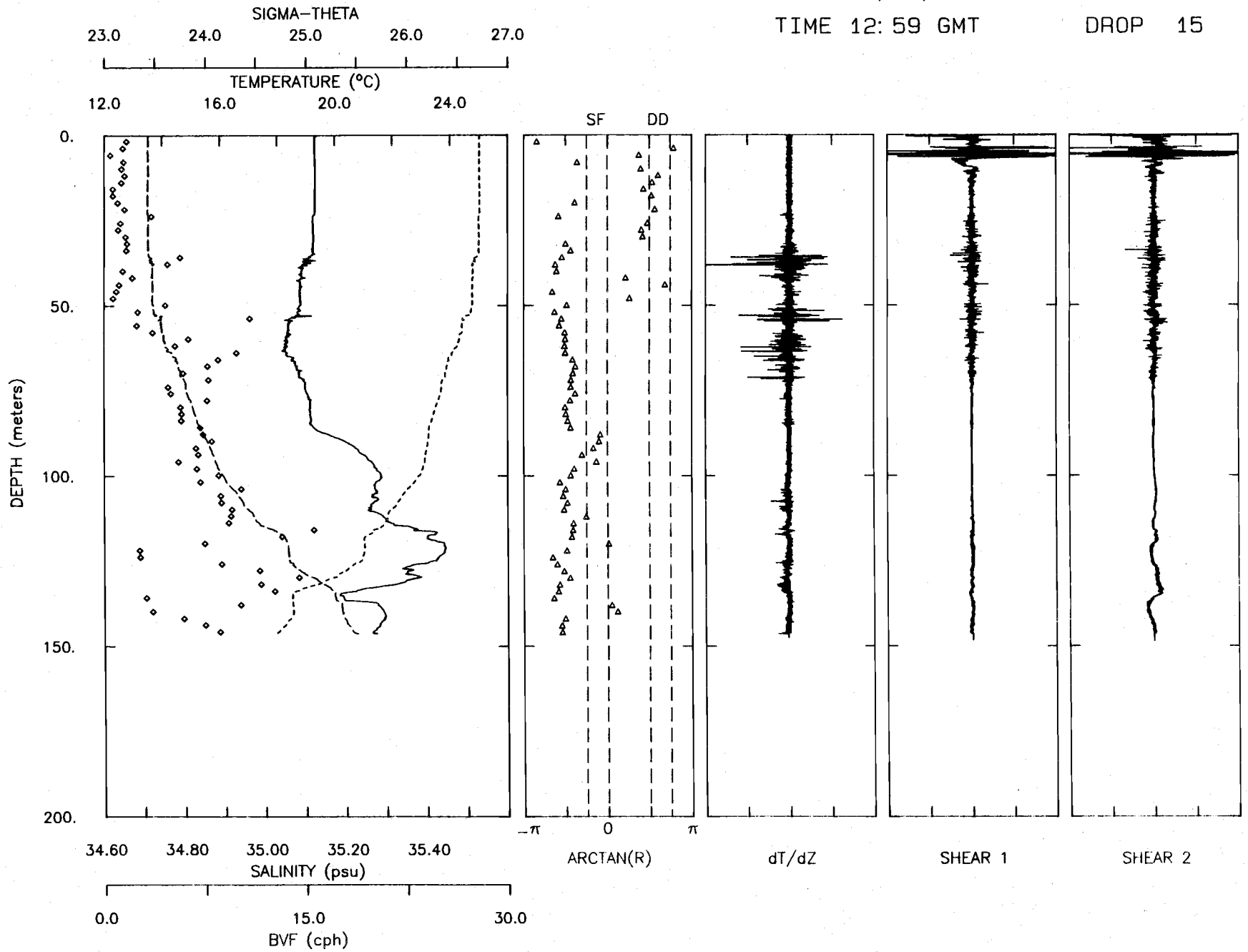


DATE 11/29/84

TAPE 160

TIME 12: 59 GMT

DROP 15

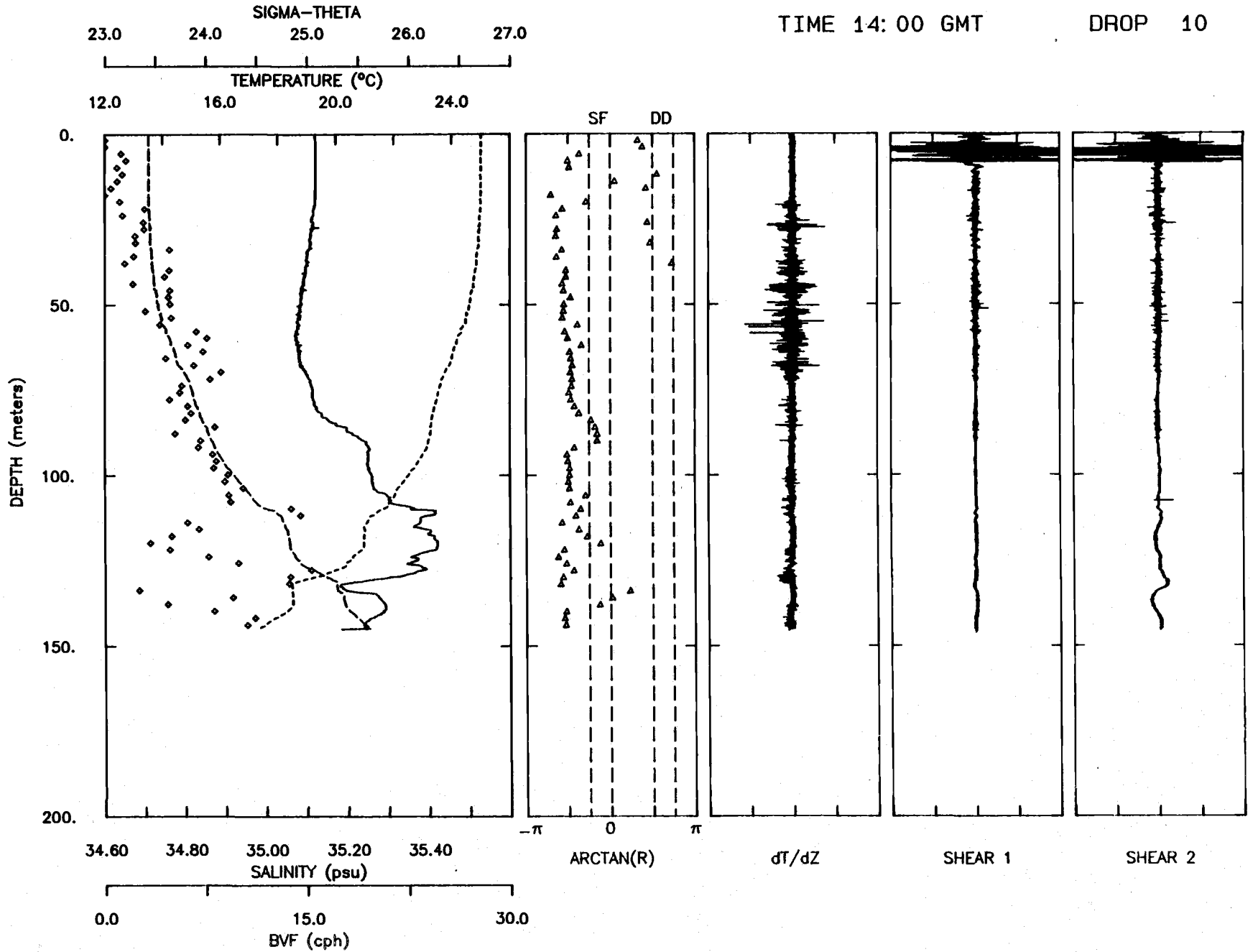


DATE 11/29/84

TAPE 161

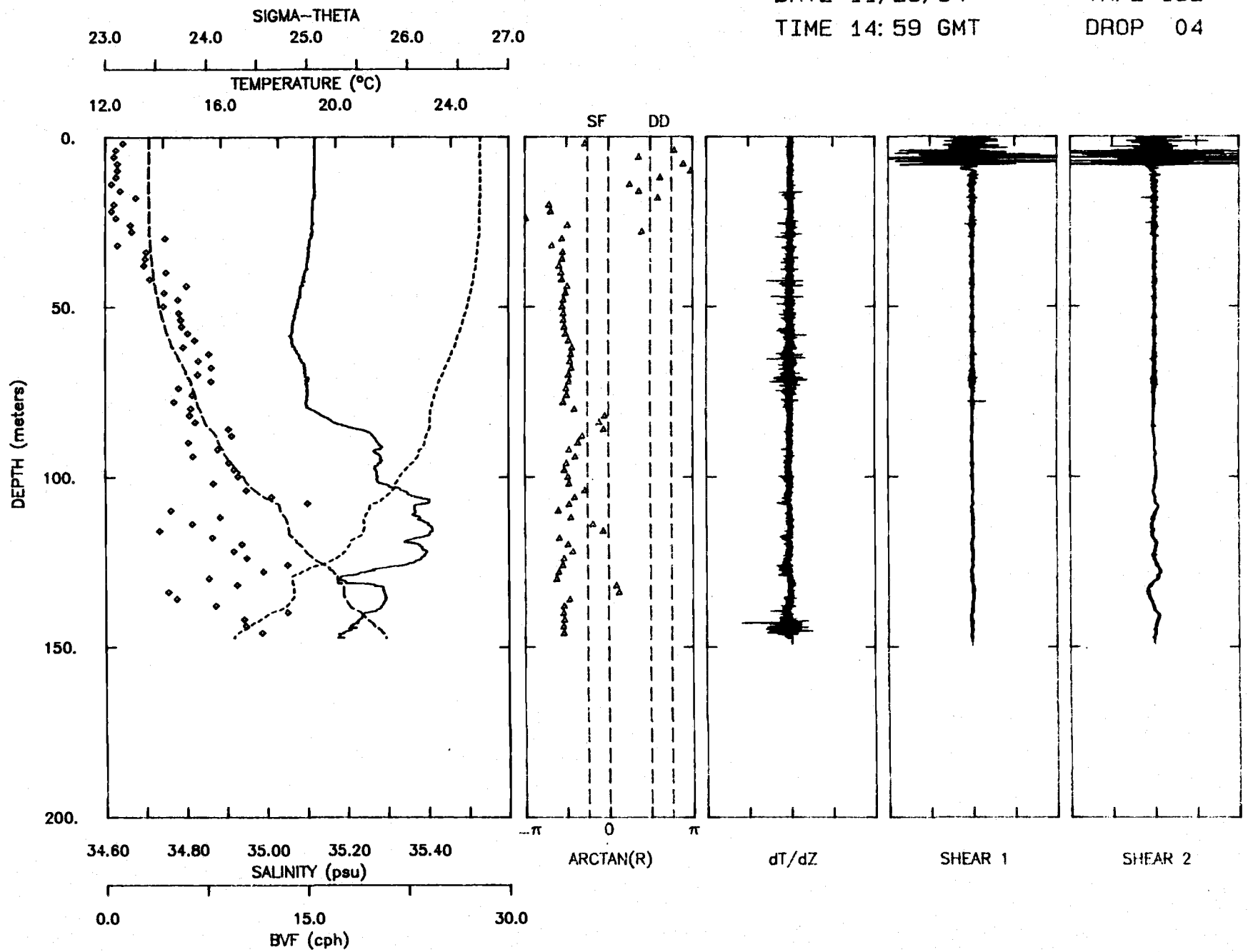
TIME 14:00 GMT

DROP 10



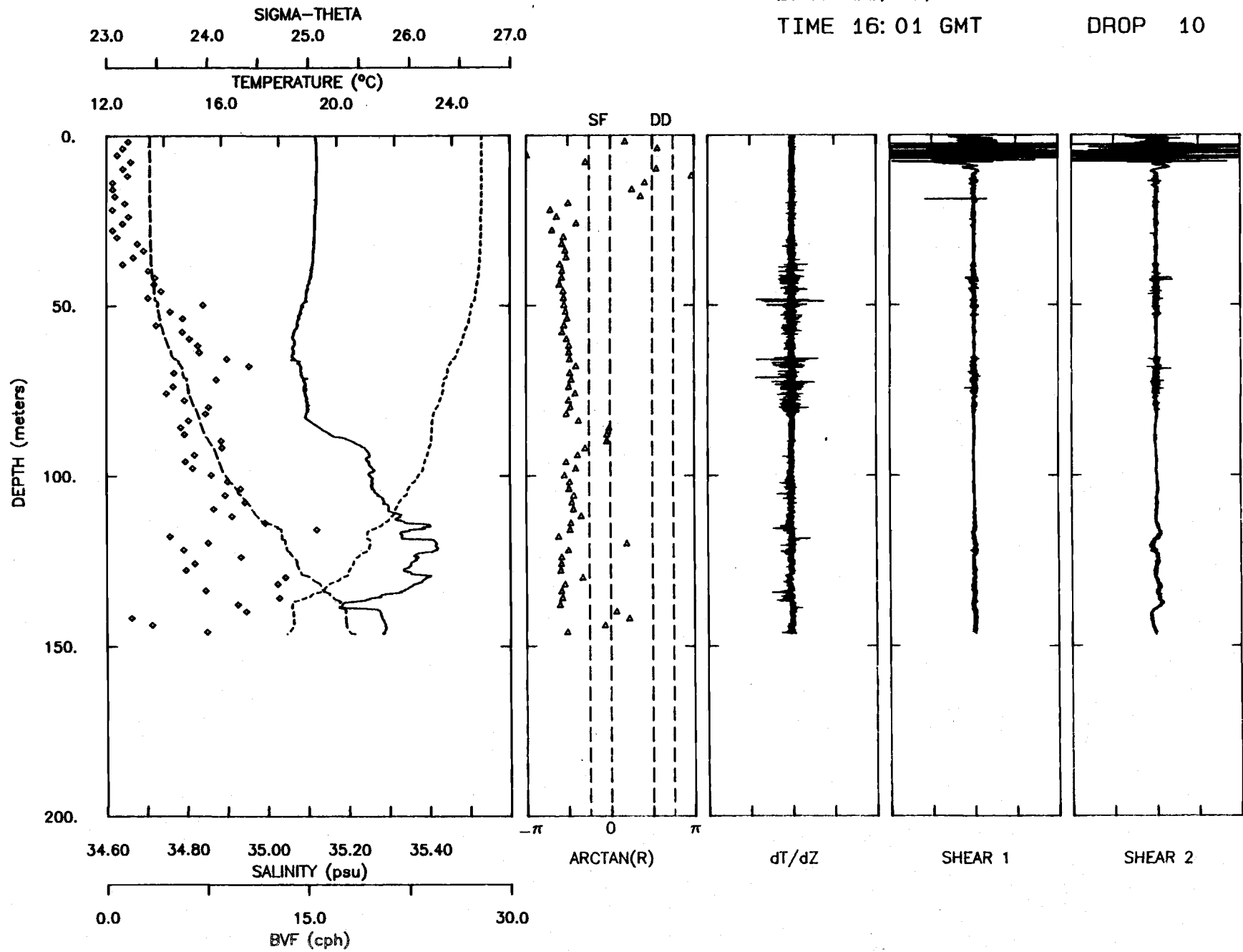
DATE 11/29/84
TIME 14:59 GMT

TAPE 162
DROP 04



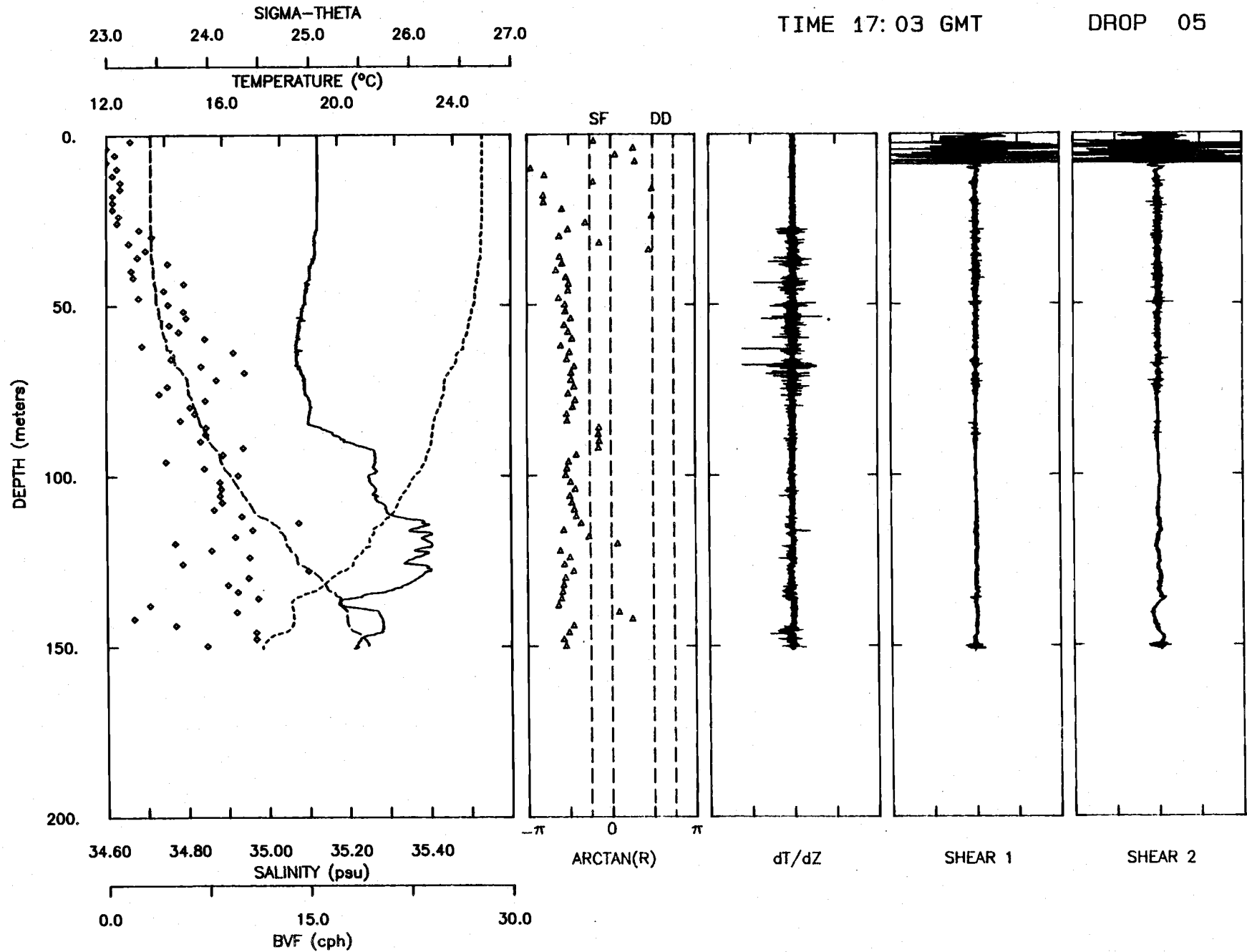
DATE 11/29/84
TIME 16:01 GMT

TAPE 162
DROP 10



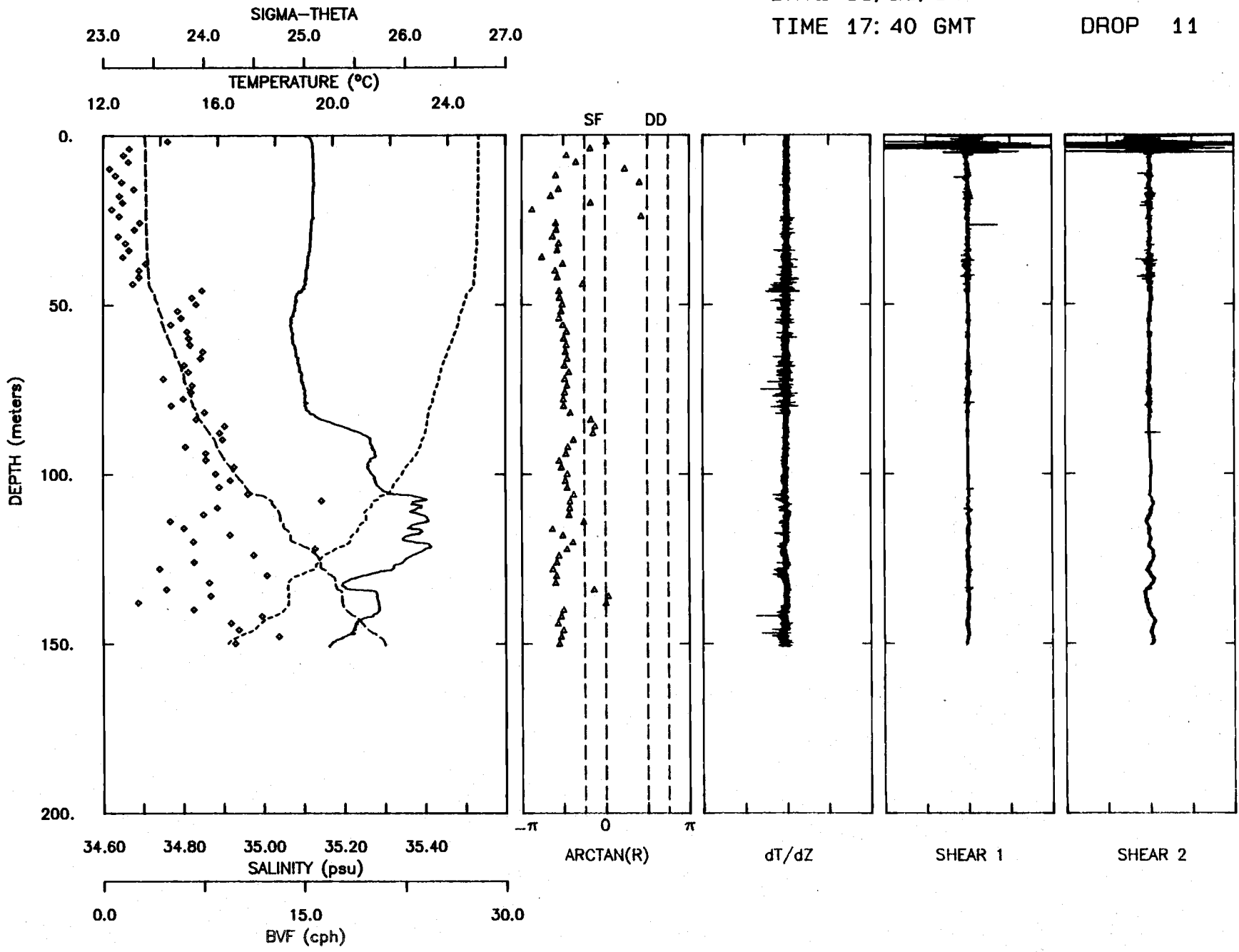
DATE 11/29/84
TIME 17:03 GMT

TAPE 163
DROP 05



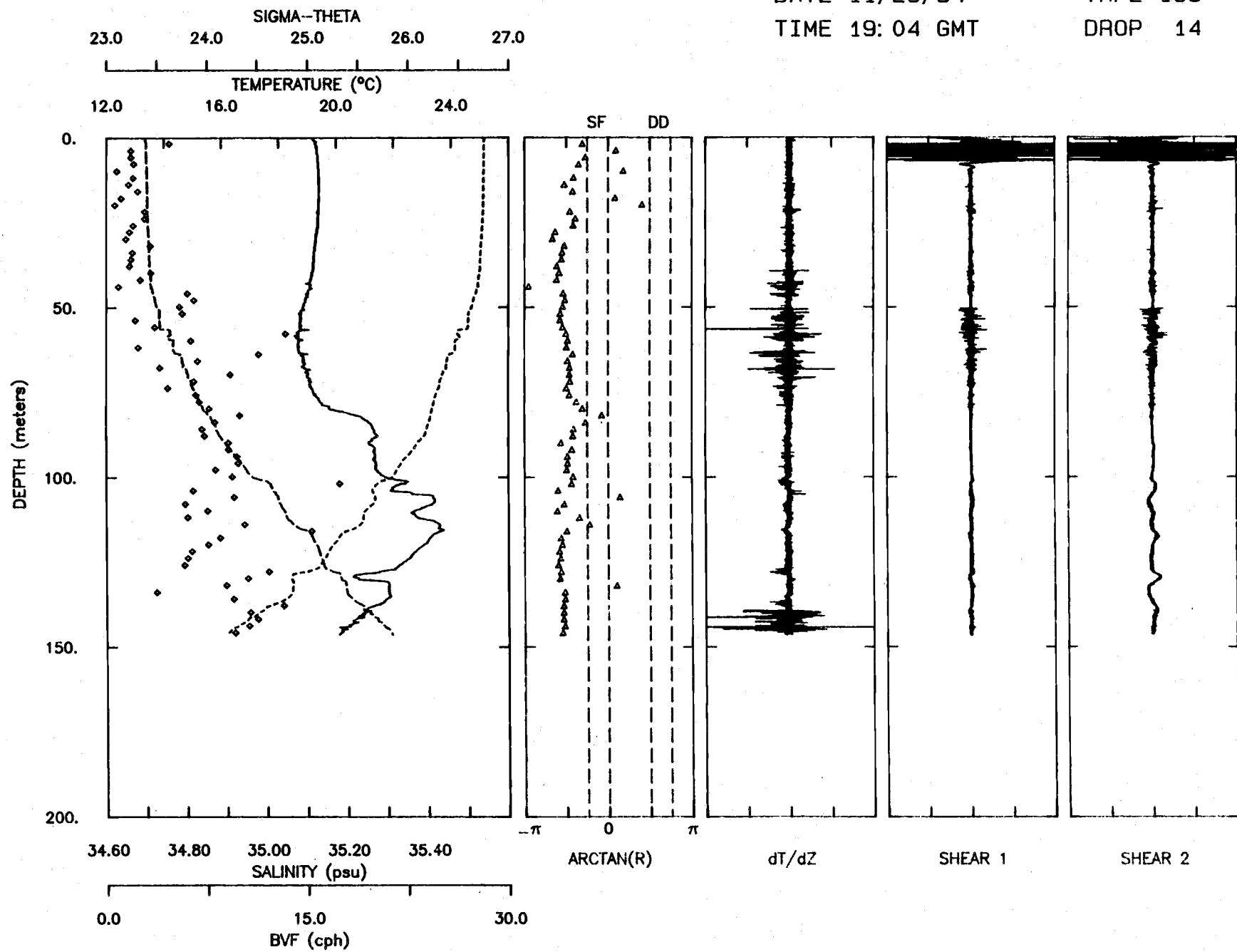
DATE 11/29/84
TIME 17:40 GMT

TAPE 163
DROP 11



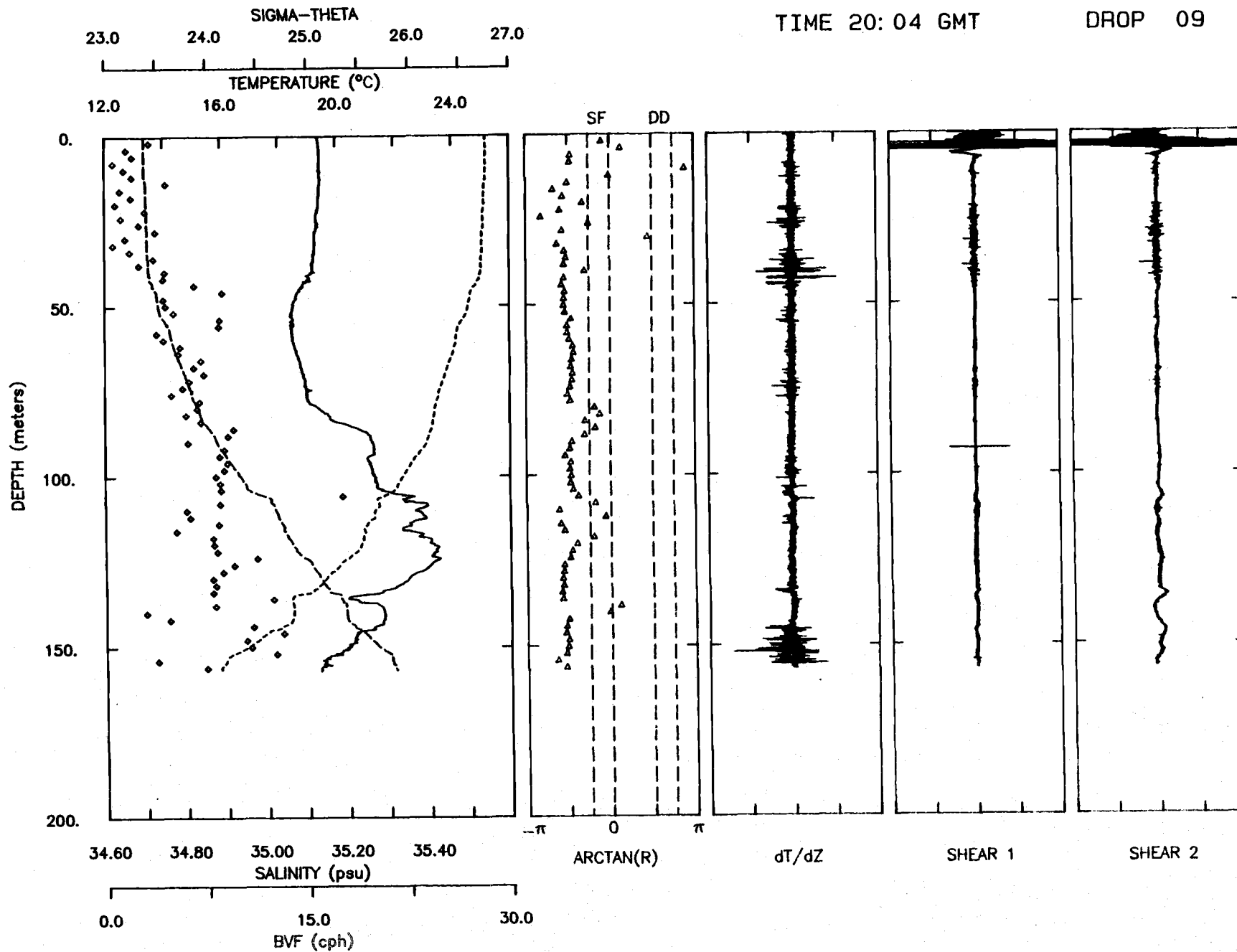
DATE 11/29/84
TIME 19:04 GMT

TAPE 163
DROP 14



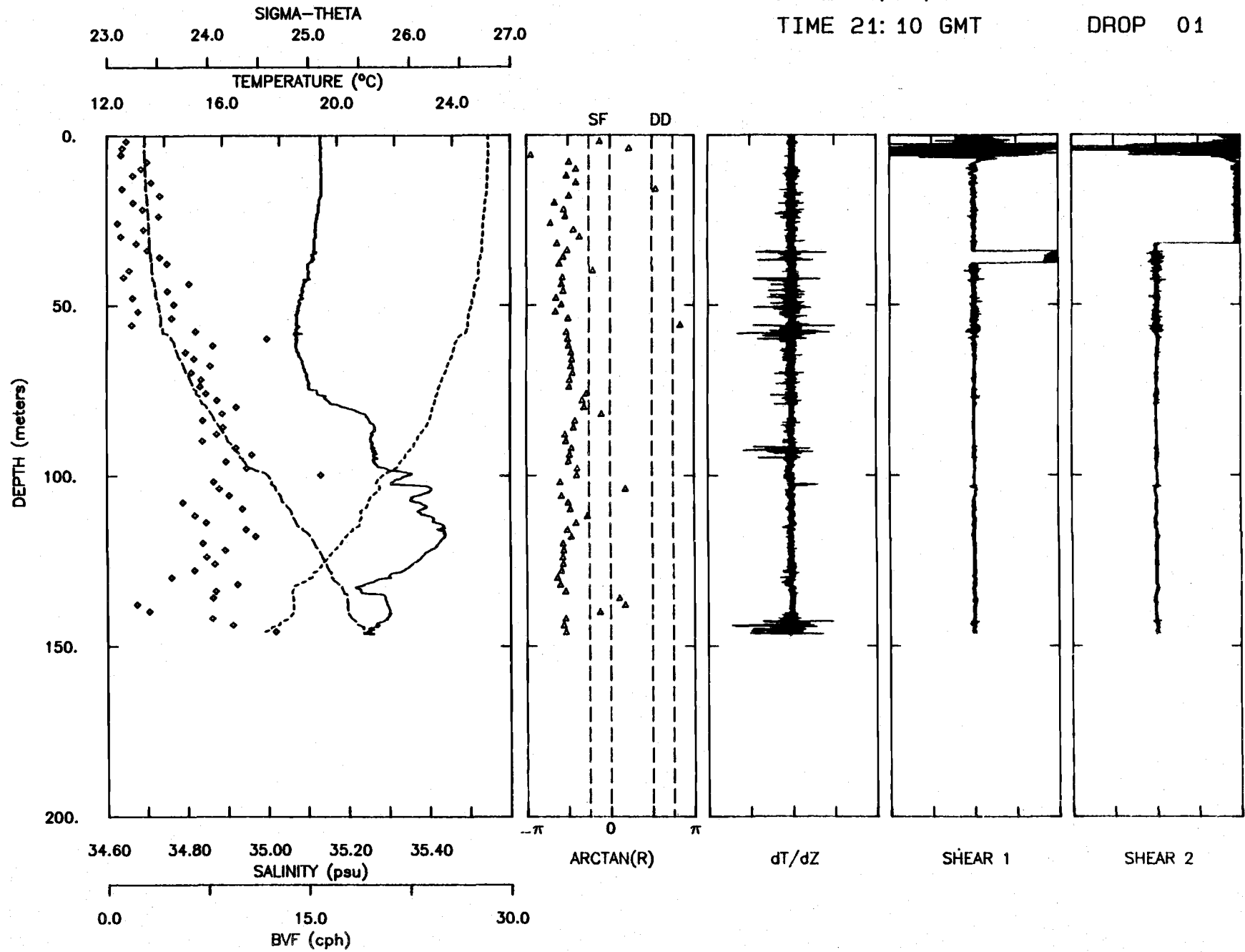
DATE 11/29/84
TIME 20:04 GMT

TAPE 164
DROP 09



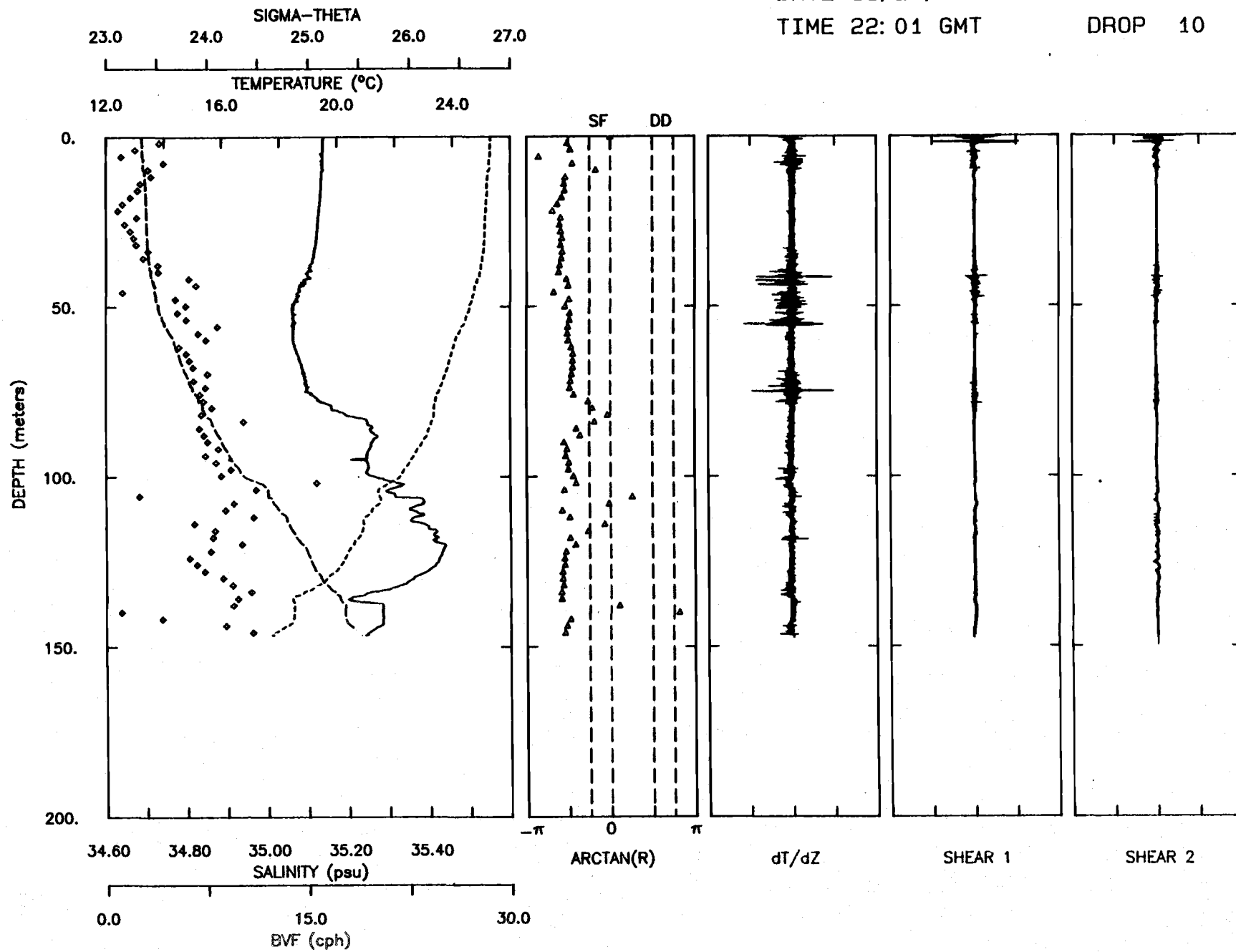
DATE 11/29/84
TIME 21:10 GMT

TAPE 165
DROP 01



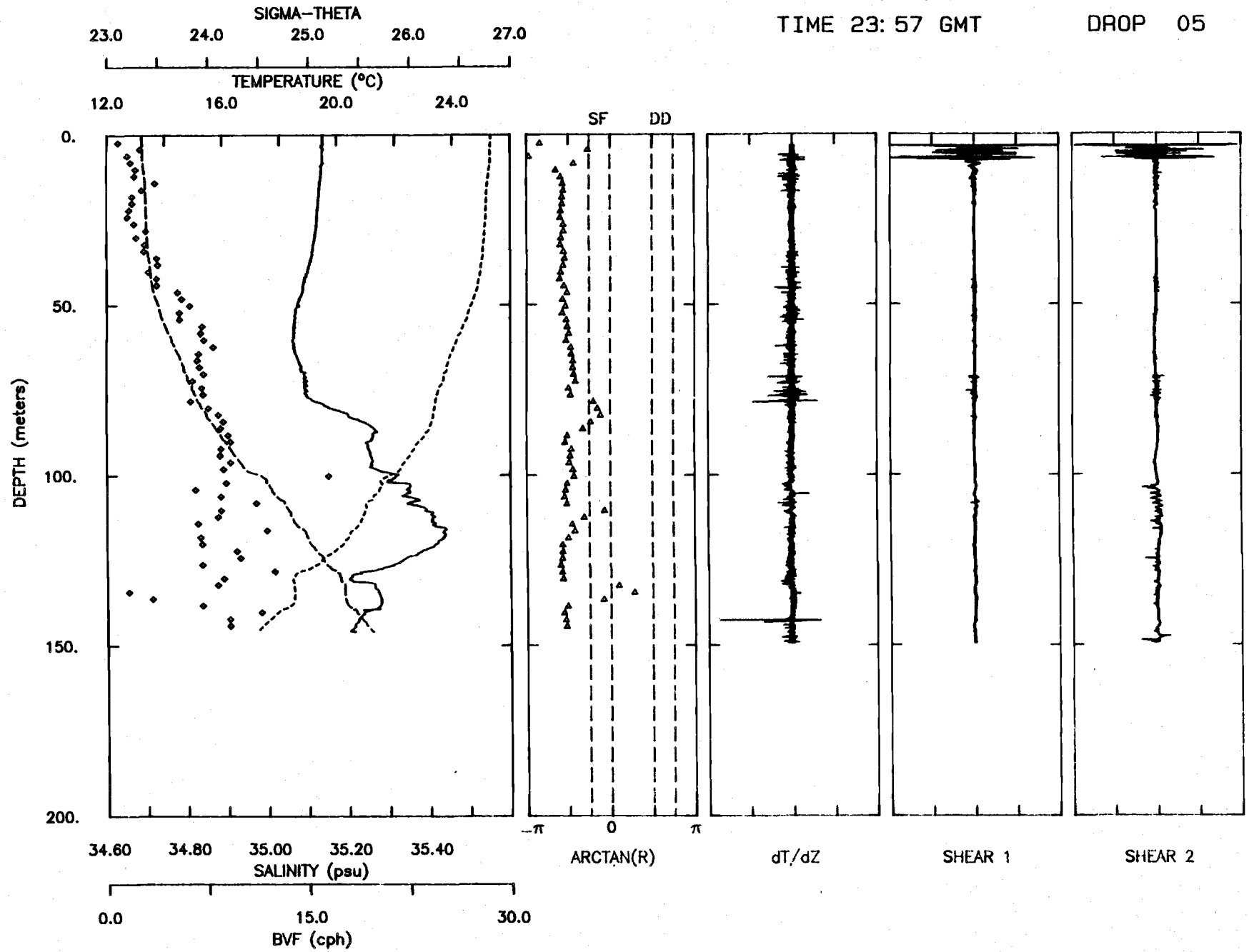
DATE 11/28/84
TIME 22:01 GMT

TAPE 165
DROP 10



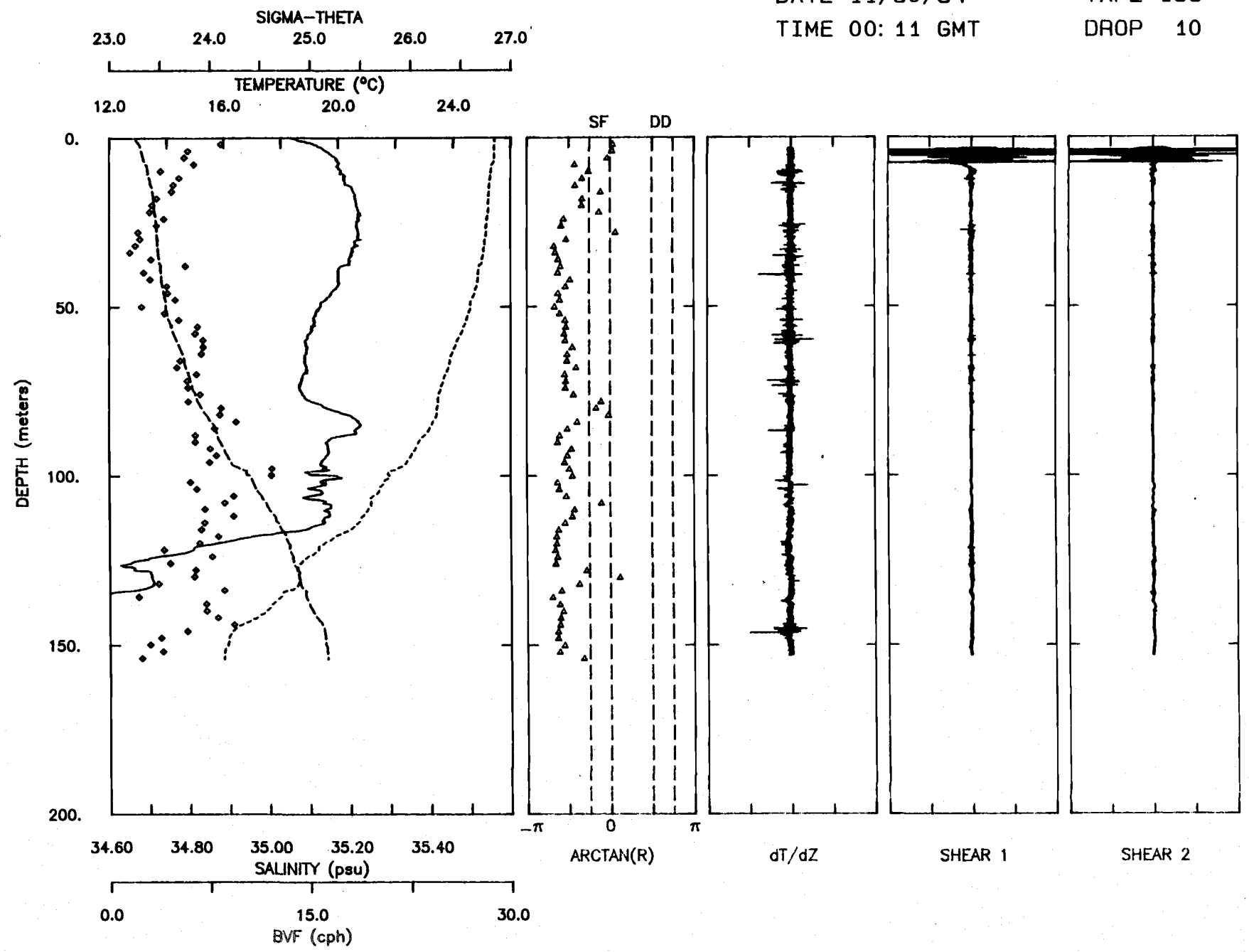
DATE 11/29/84
TIME 23:57 GMT

TAPE 166
DROP 05



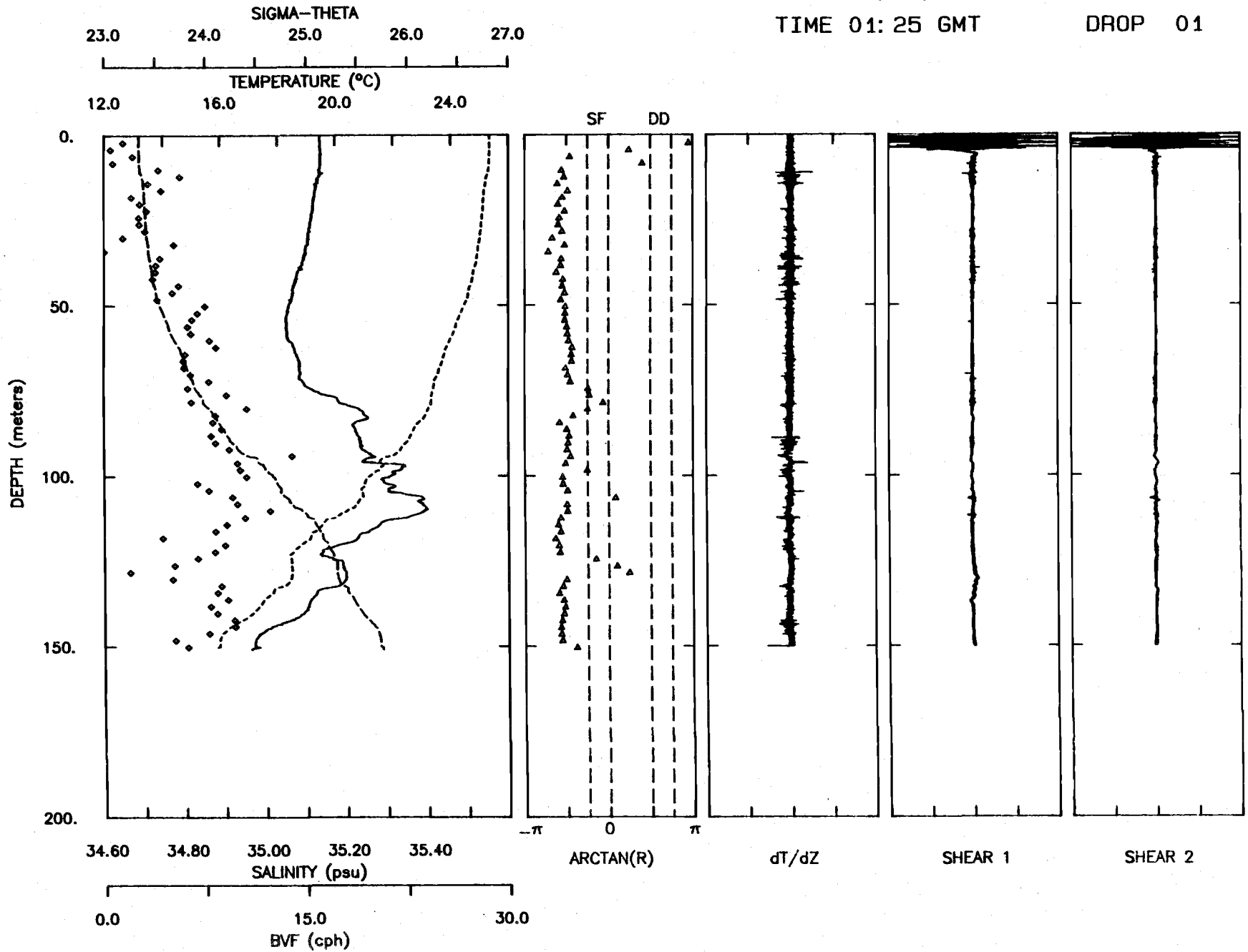
DATE 11/30/84
TIME 00:11 GMT

TAPE 166
DROP 10



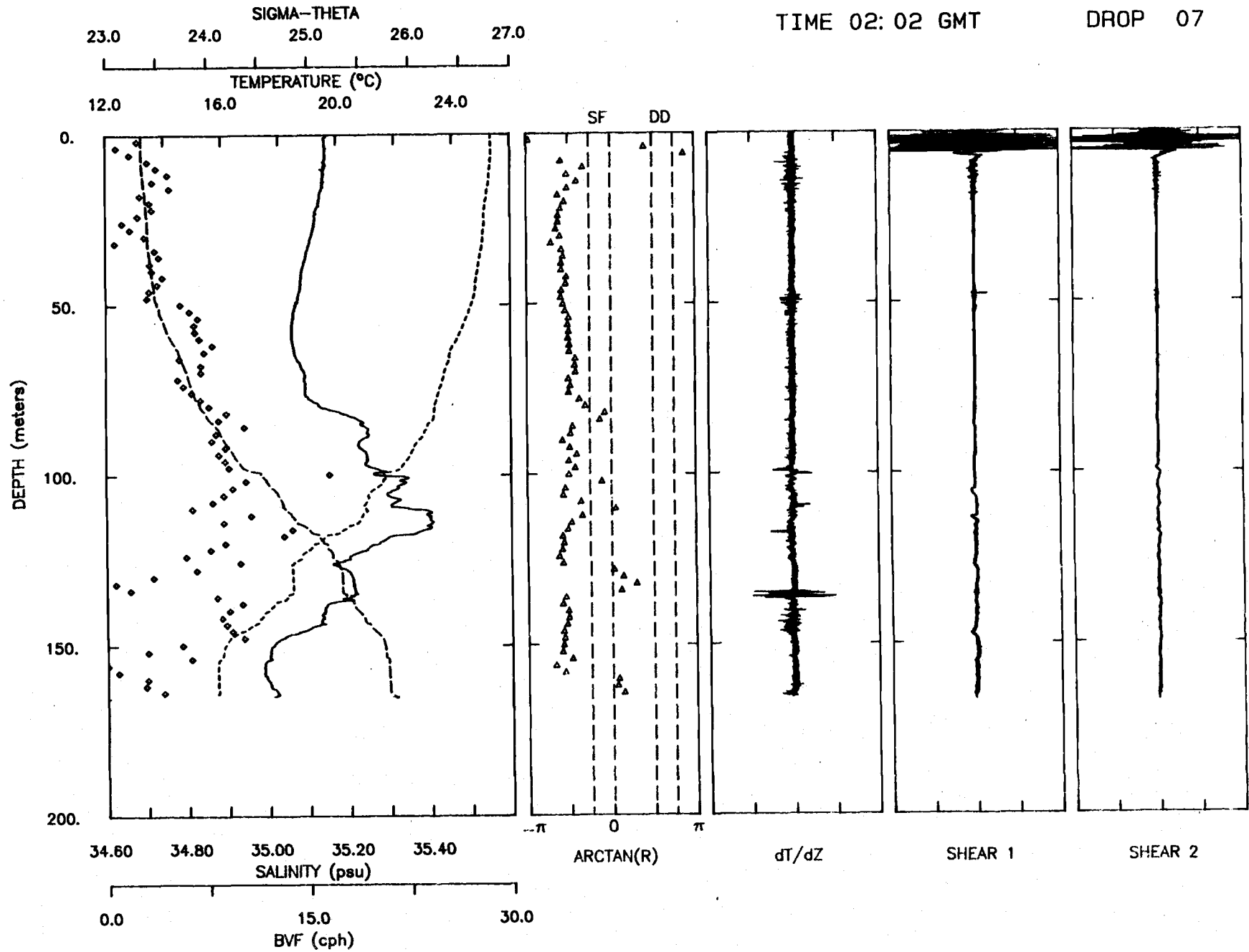
DATE 11/30/84
TIME 01:25 GMT

TAPE 168
DROP 01



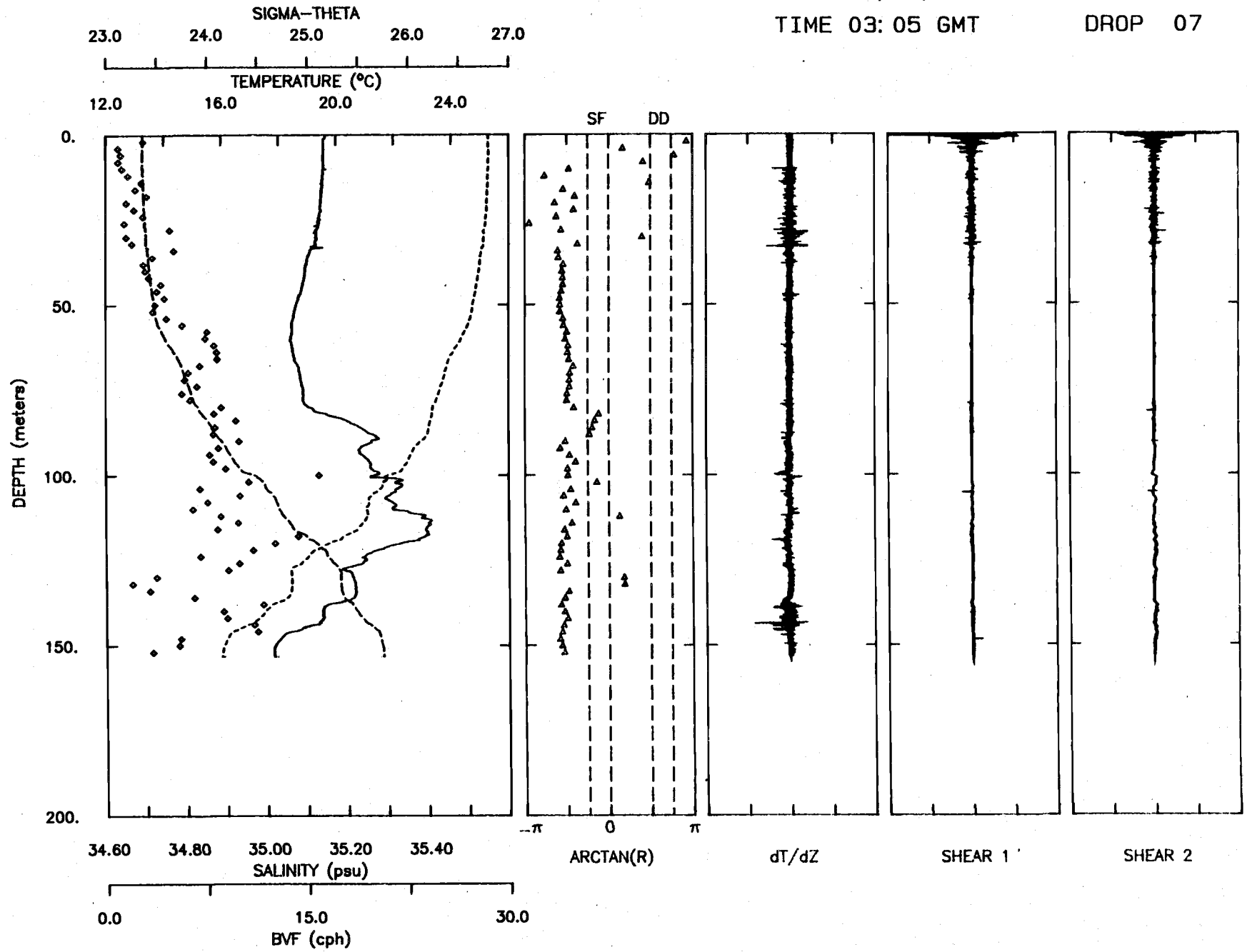
DATE 11/30/84
TIME 02:02 GMT

TAPE 168
DROP 07



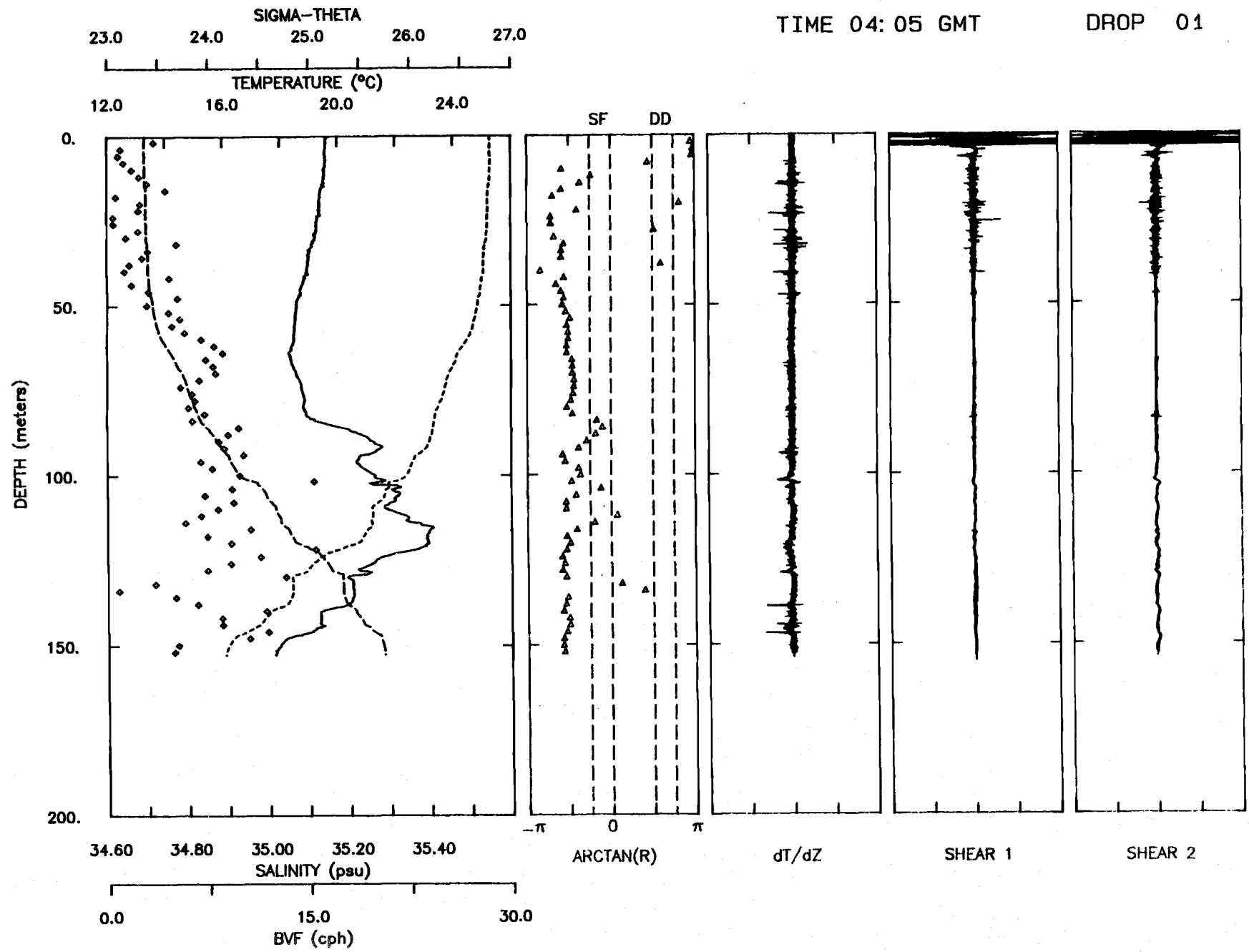
DATE 11/30/84
TIME 03:05 GMT

TAPE 169
DROP 07



DATE 11/30/84
TIME 04:05 GMT

TAPE 170
DROP 01

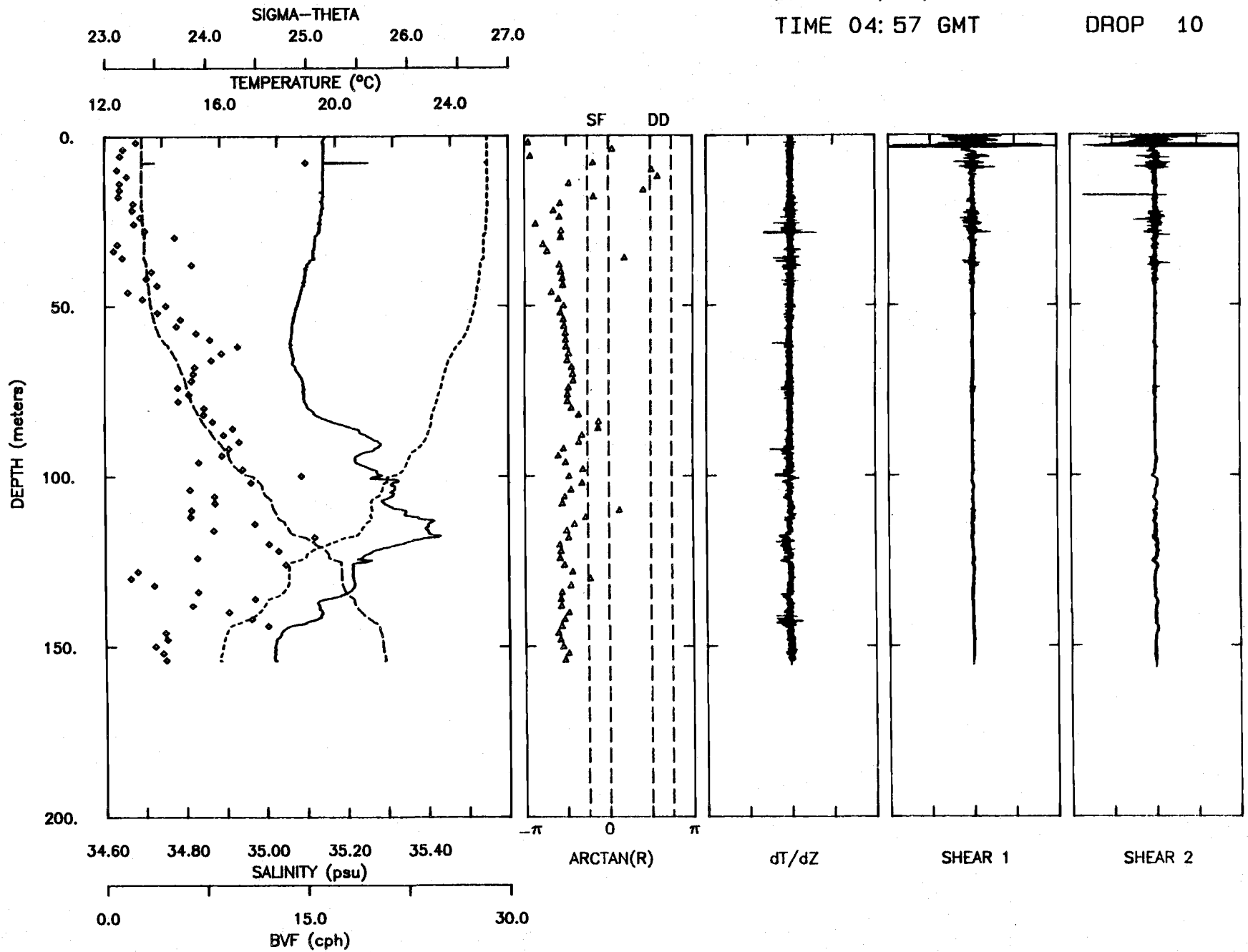


DATE 11/30/84

TAPE 170

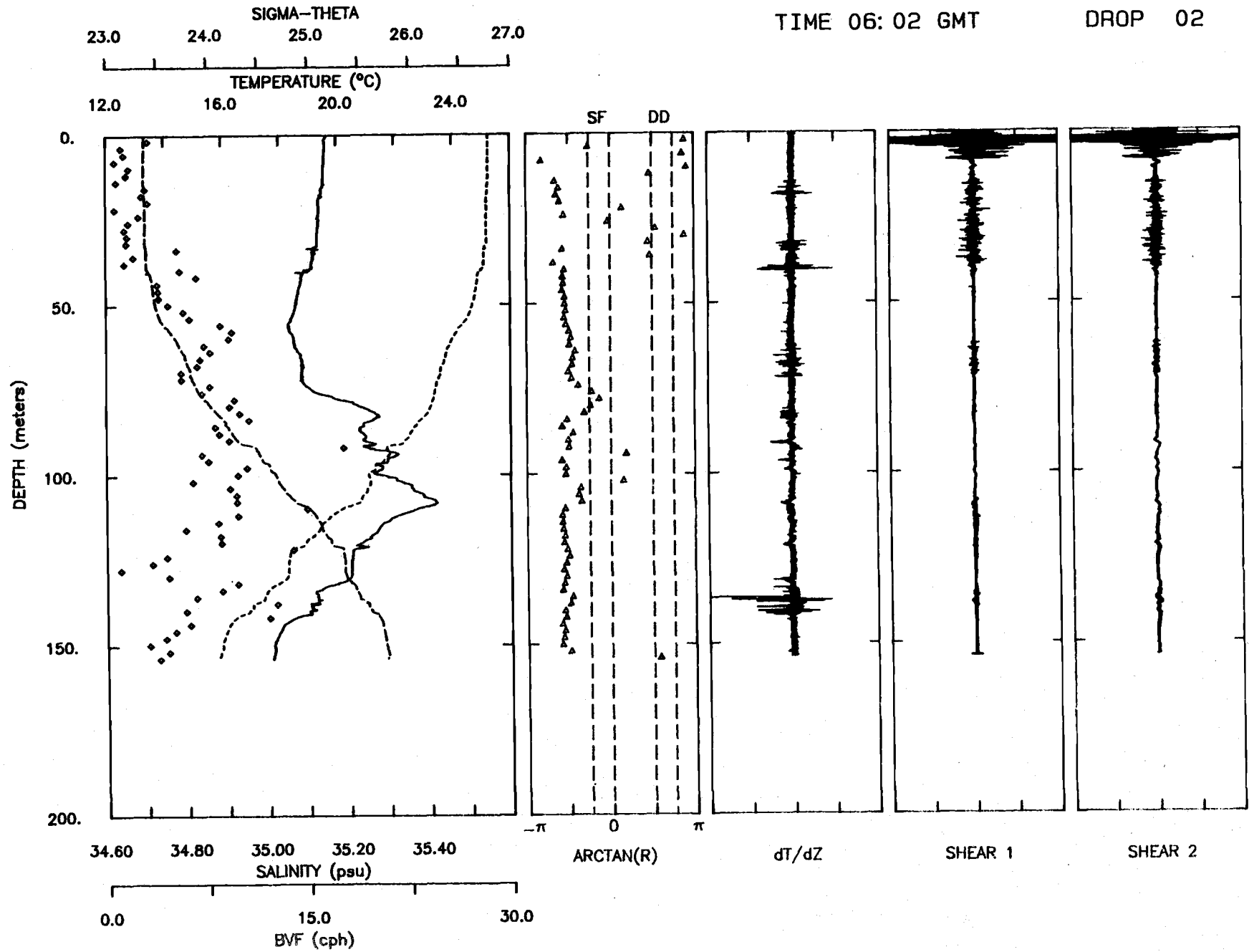
TIME 04:57 GMT

DROP 10



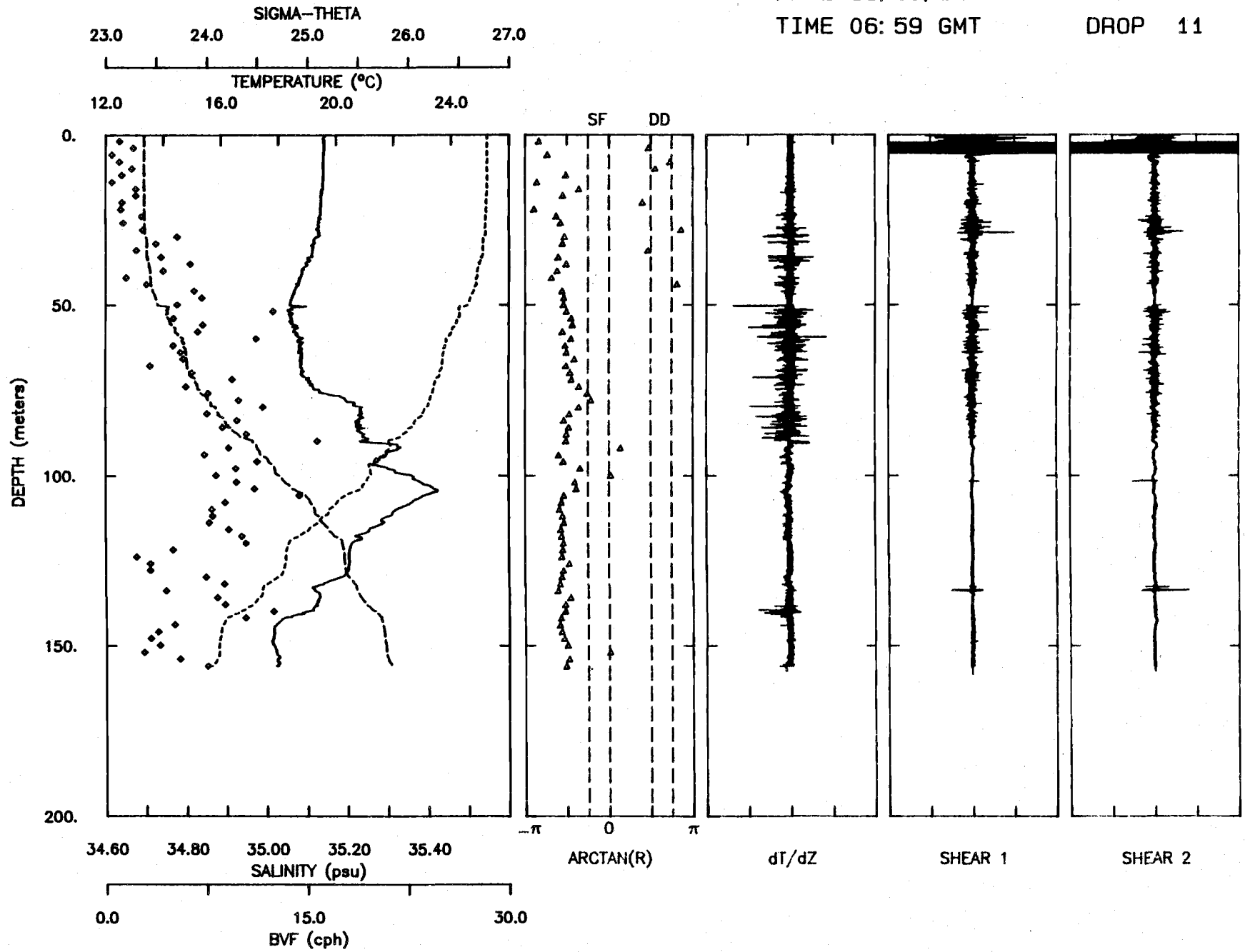
DATE 11/30/84
TIME 06:02 GMT

TAPE 171
DROP 02



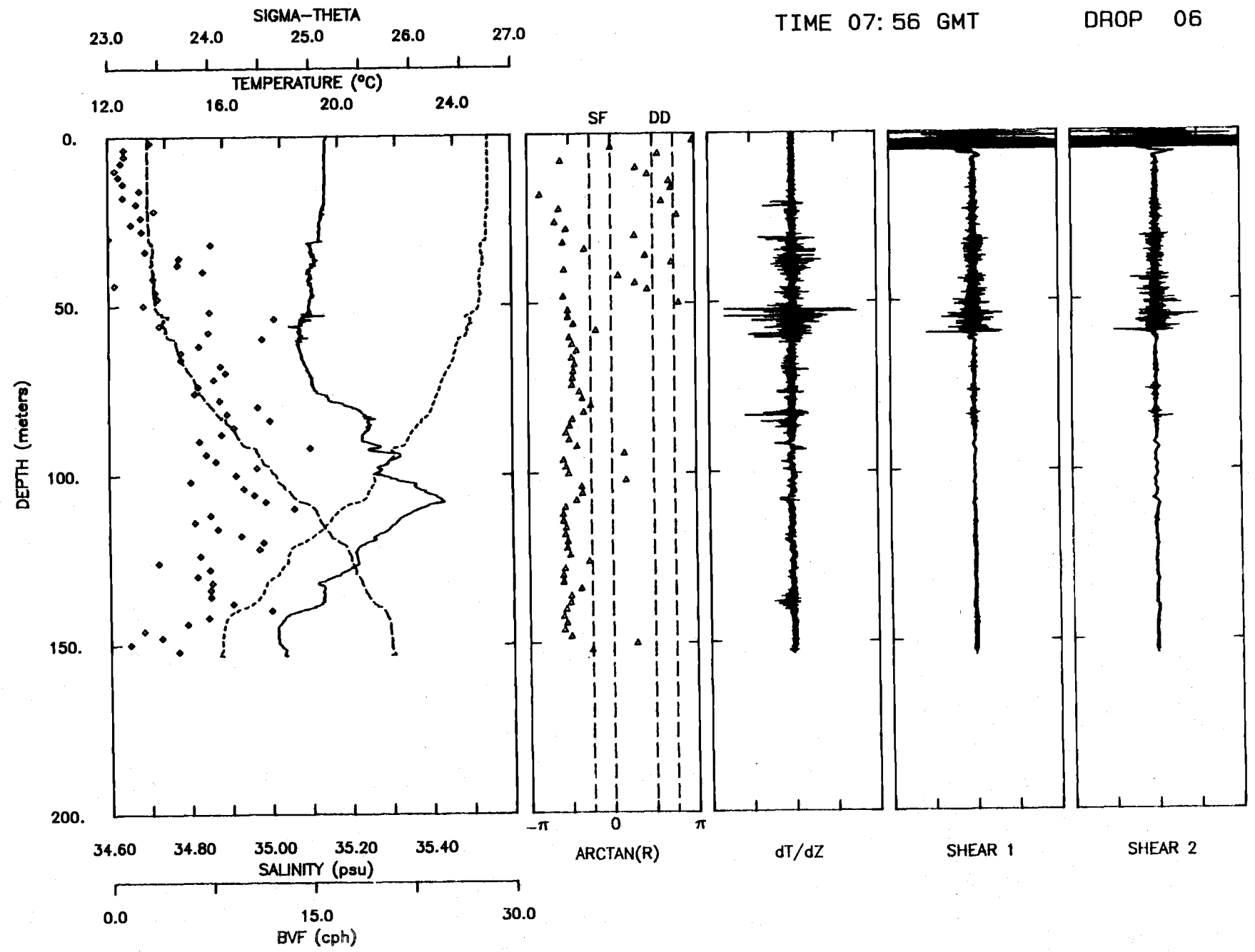
DATE 11/30/84
TIME 06:59 GMT

TAPE 171
DROP 11



DATE 11/30/84
TIME 07:56 GMT

TAPE 172
DROP 06

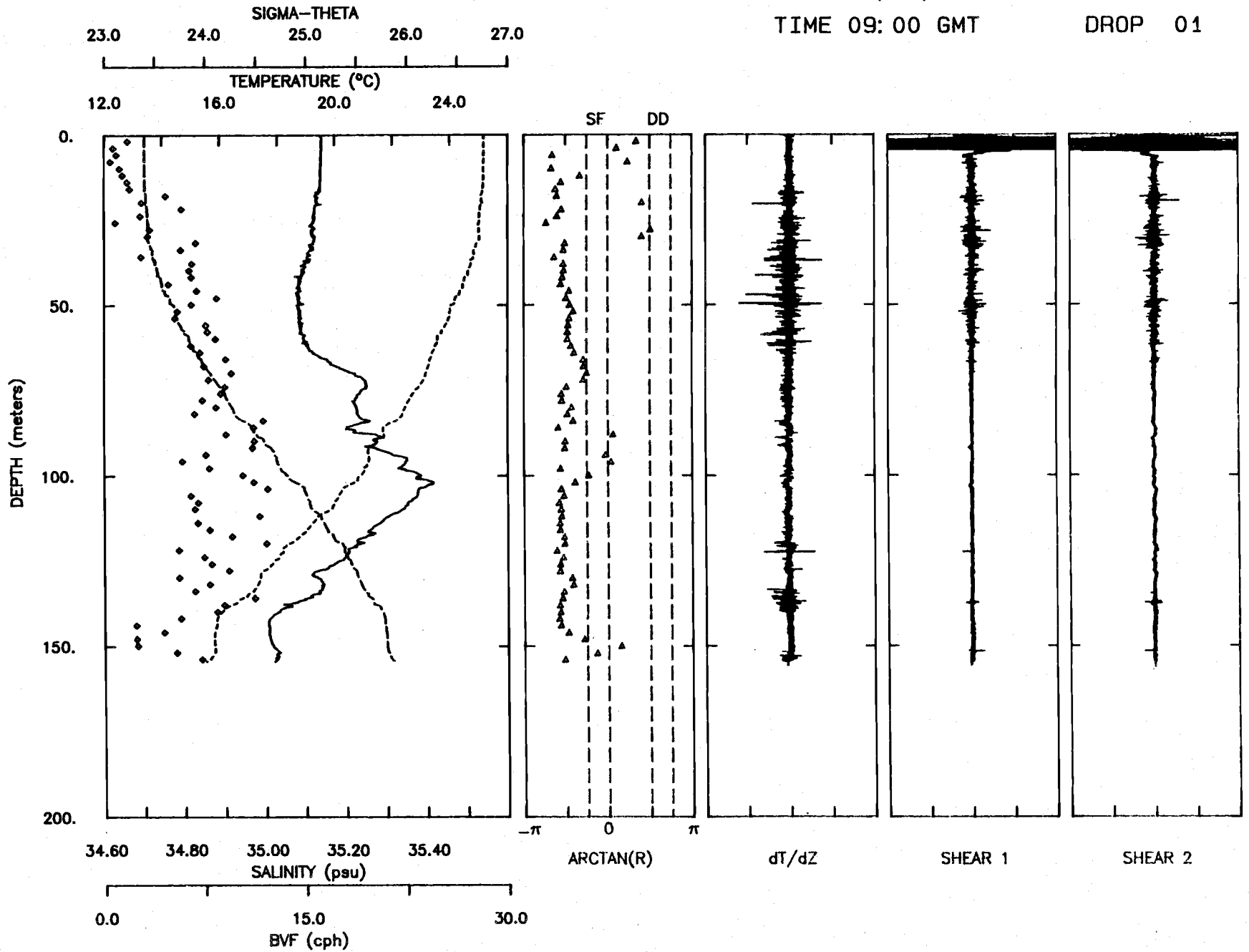


DATE 11/30/84

TAPE 173

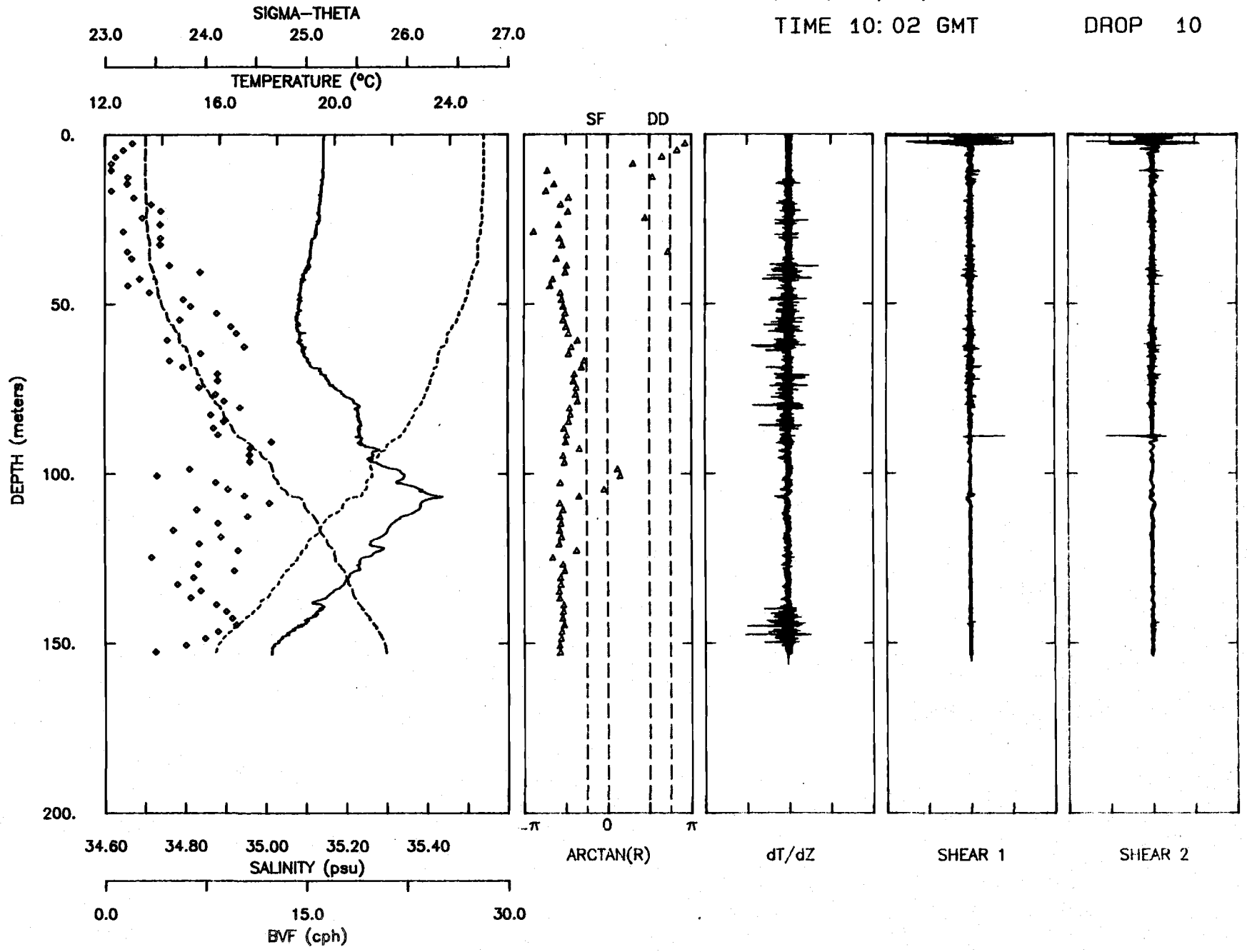
TIME 09:00 GMT

DROP 01



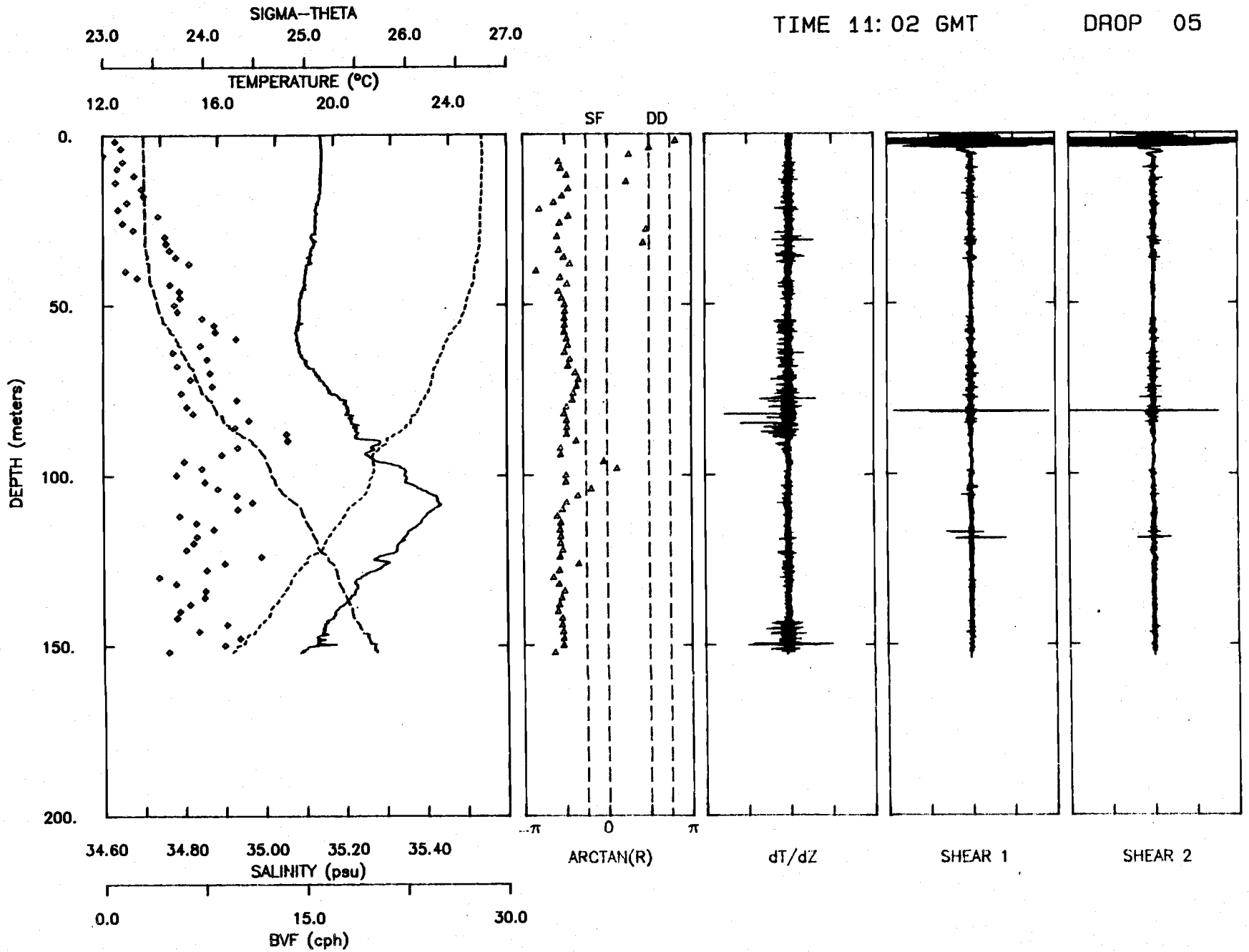
DATE 11/30/84
TIME 10:02 GMT

TAPE 173
DROP 10



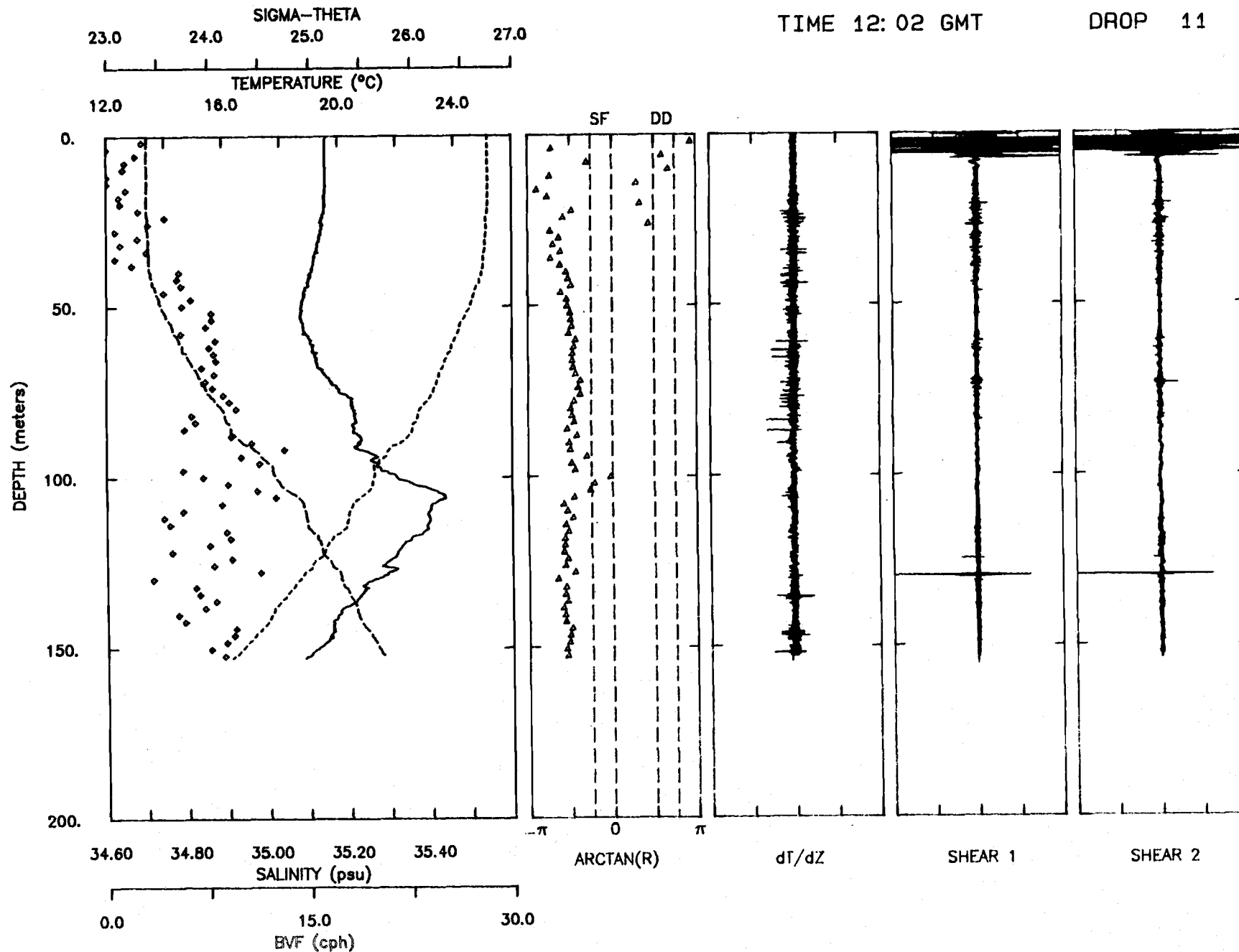
DATE 11/30/84
TIME 11:02 GMT

TAPE 174
DROP 05



DATE 11/30/84
TIME 12:02 GMT

TAPE 174
DROP 11

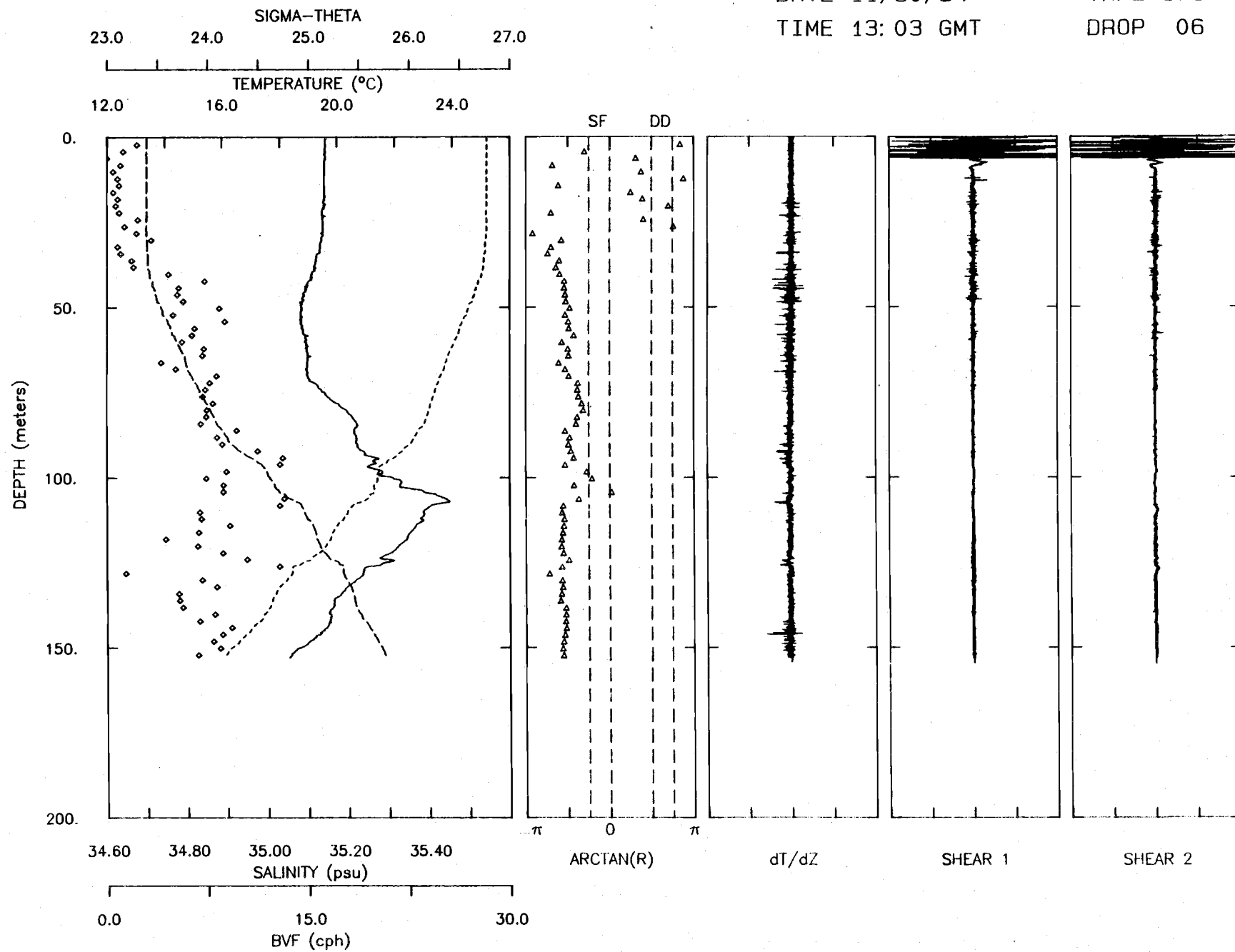


DATE 11/30/84

TAPE 175

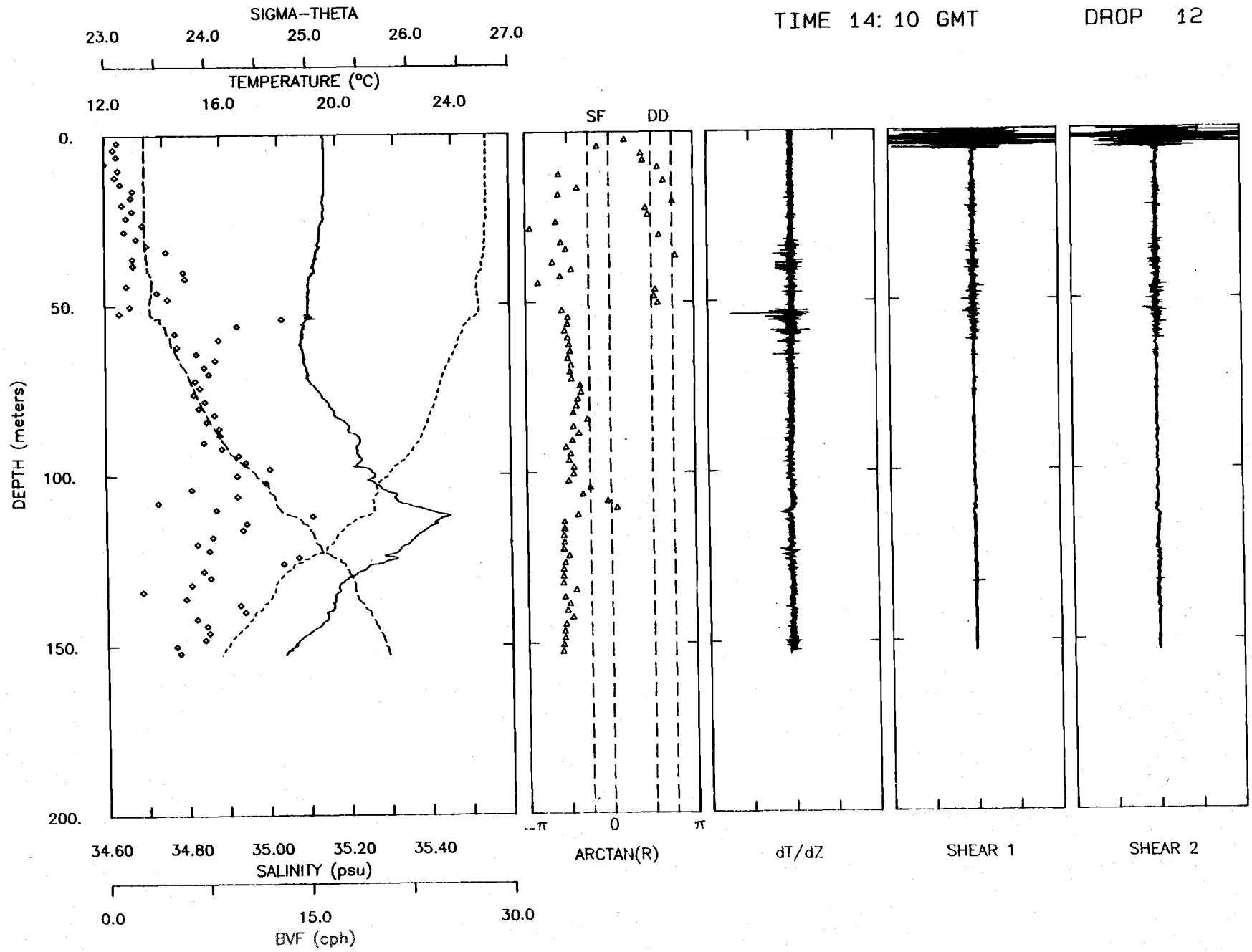
TIME 13:03 GMT

DROP 06



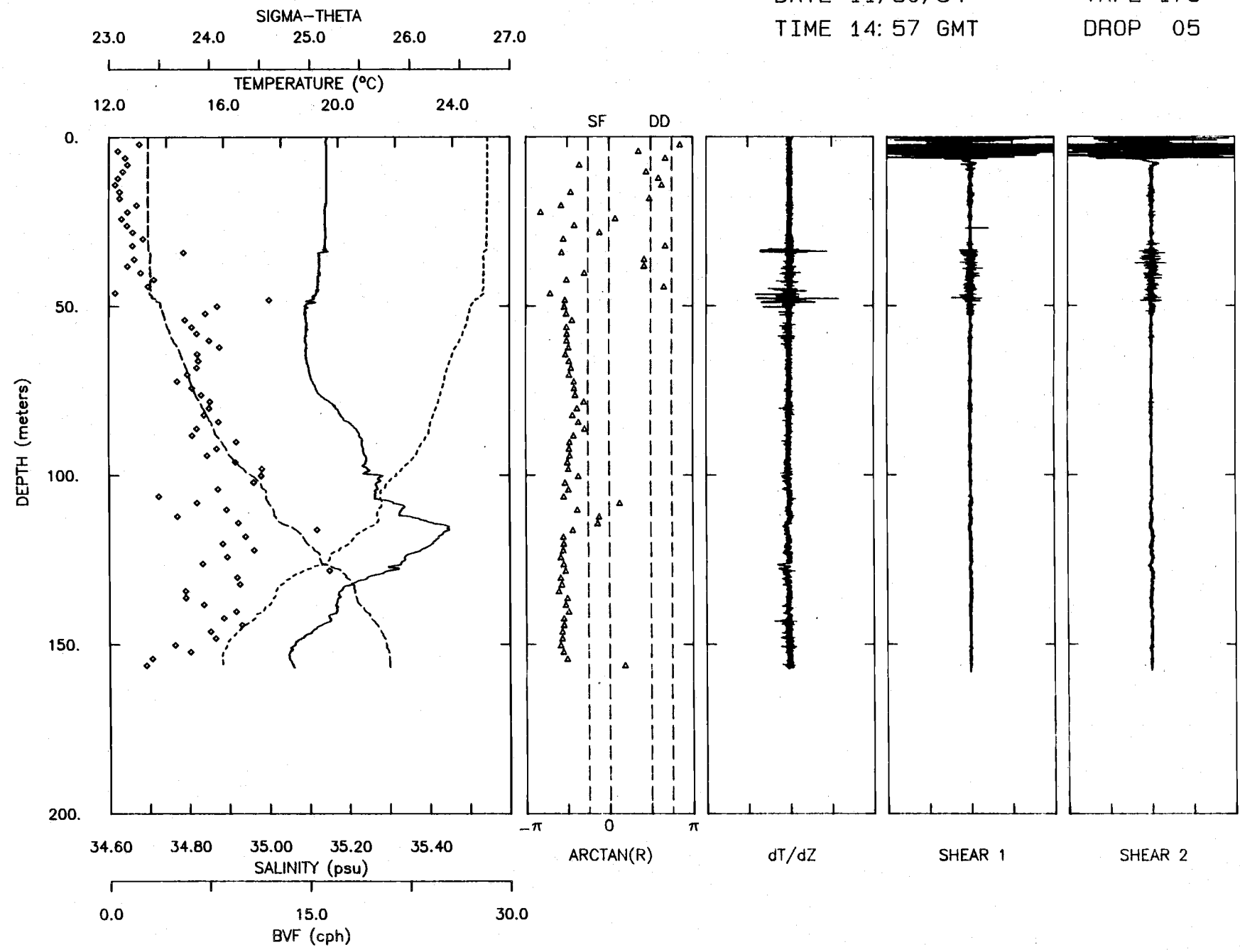
DATE 11/30/84
TIME 14:10 GMT

TAPE 175
DROP 12



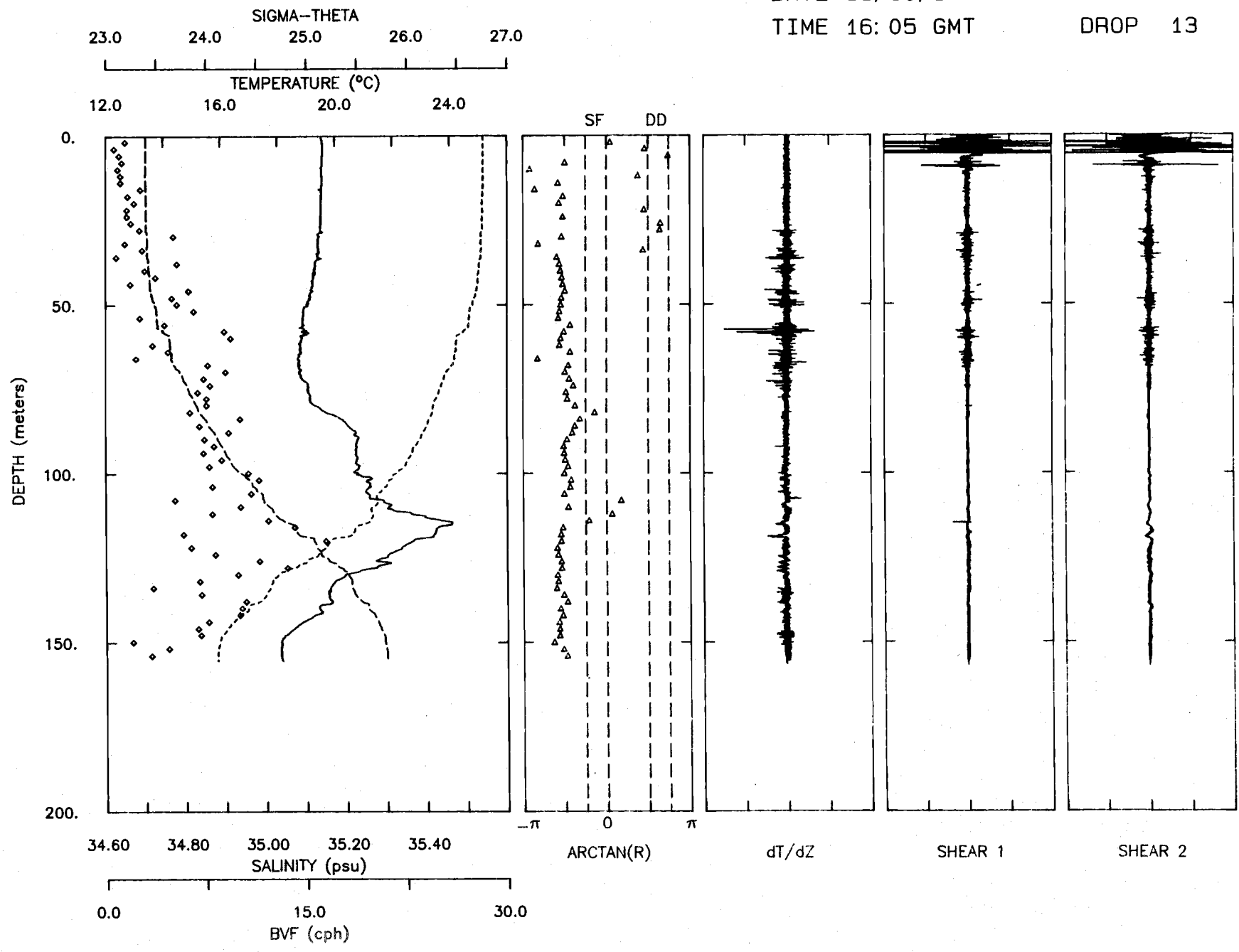
DATE 11/30/84
TIME 14:57 GMT

TAPE 176
DROP 05



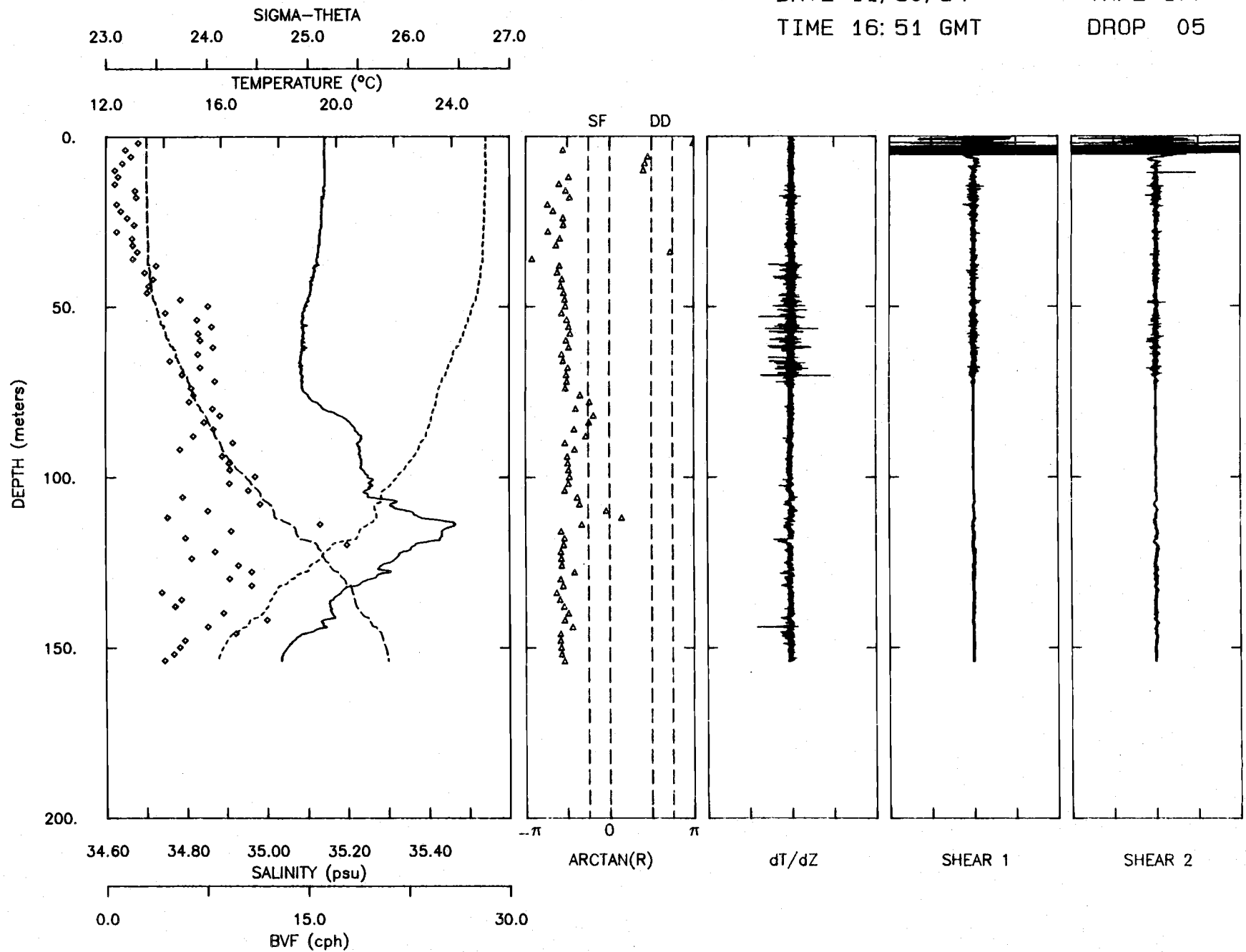
DATE 11/30/84
TIME 16:05 GMT

TAPE 176
DROP 13



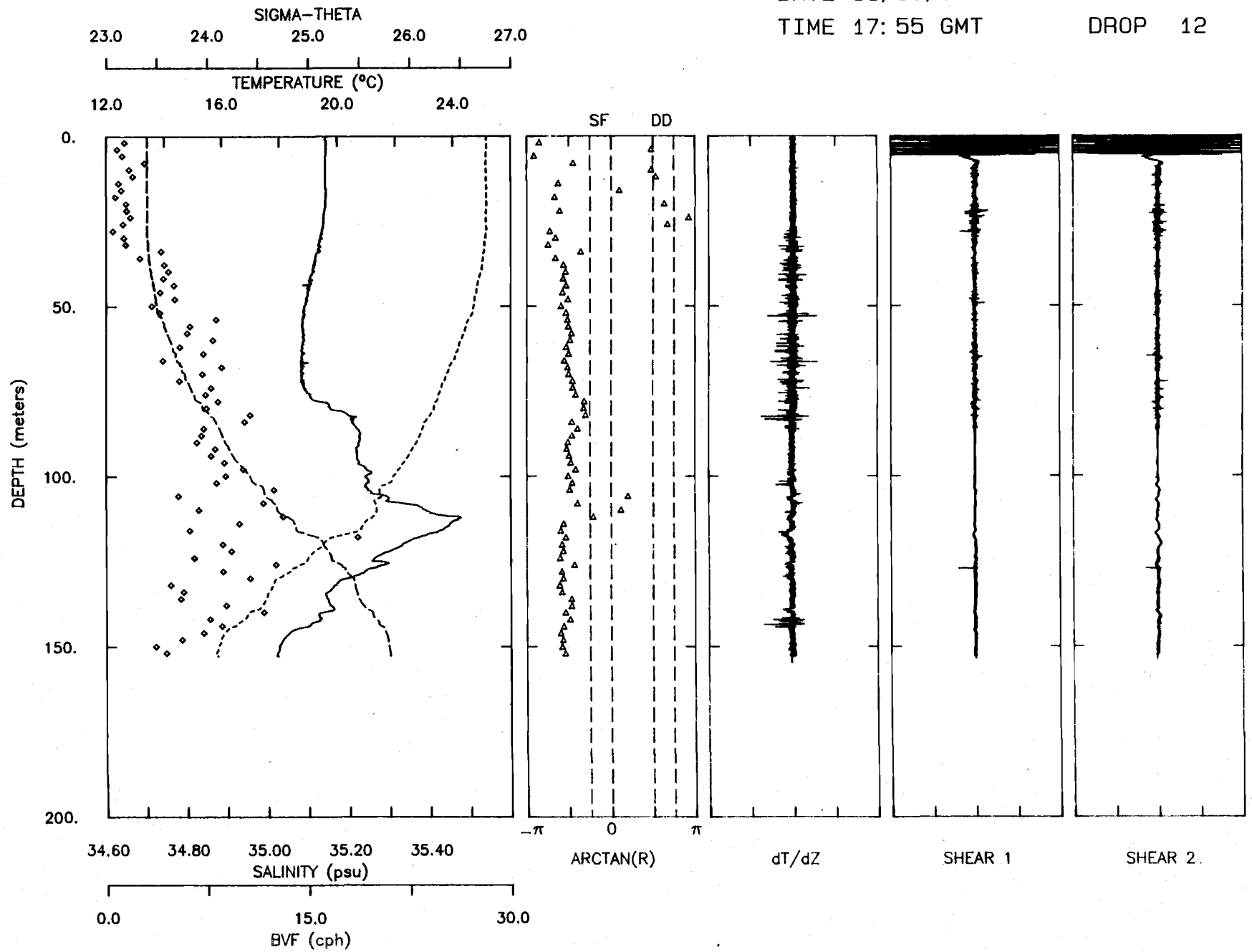
DATE 11/30/84
TIME 16:51 GMT

TAPE 177
DROP 05



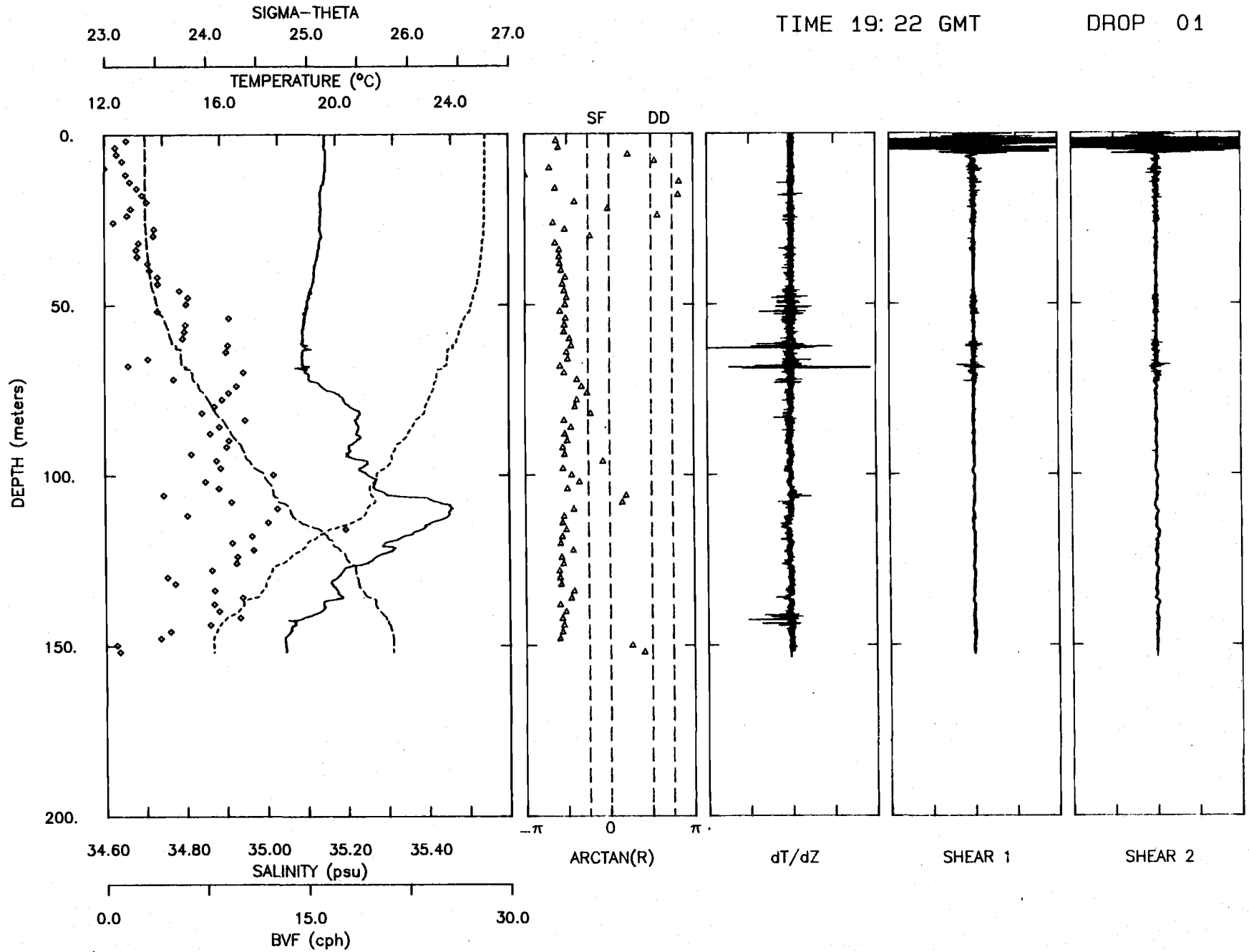
DATE 11/30/84
TIME 17:55 GMT

TAPE 177
DROP 12



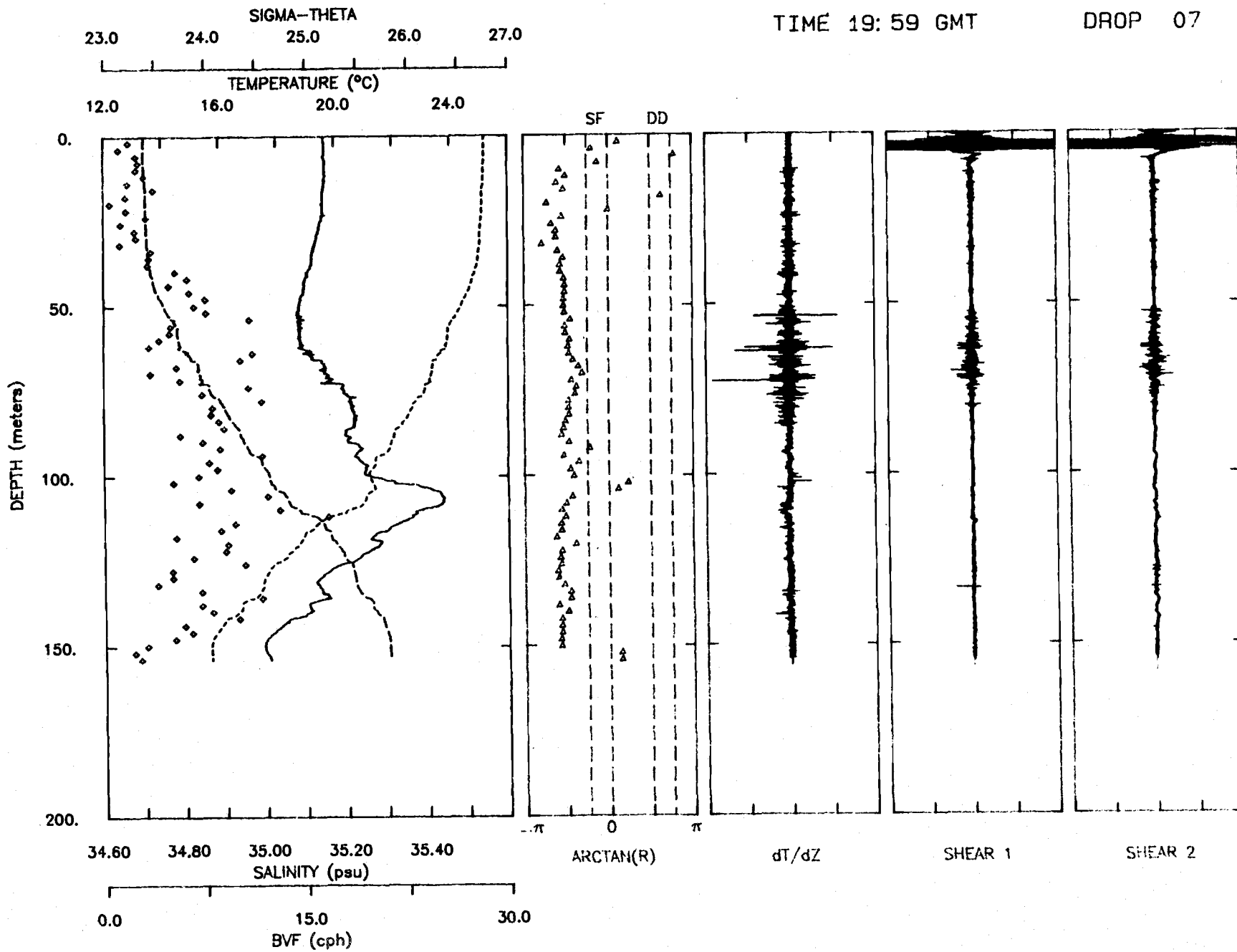
DATE 11/30/84
TIME 19:22 GMT

TAPE 178
DROP 01



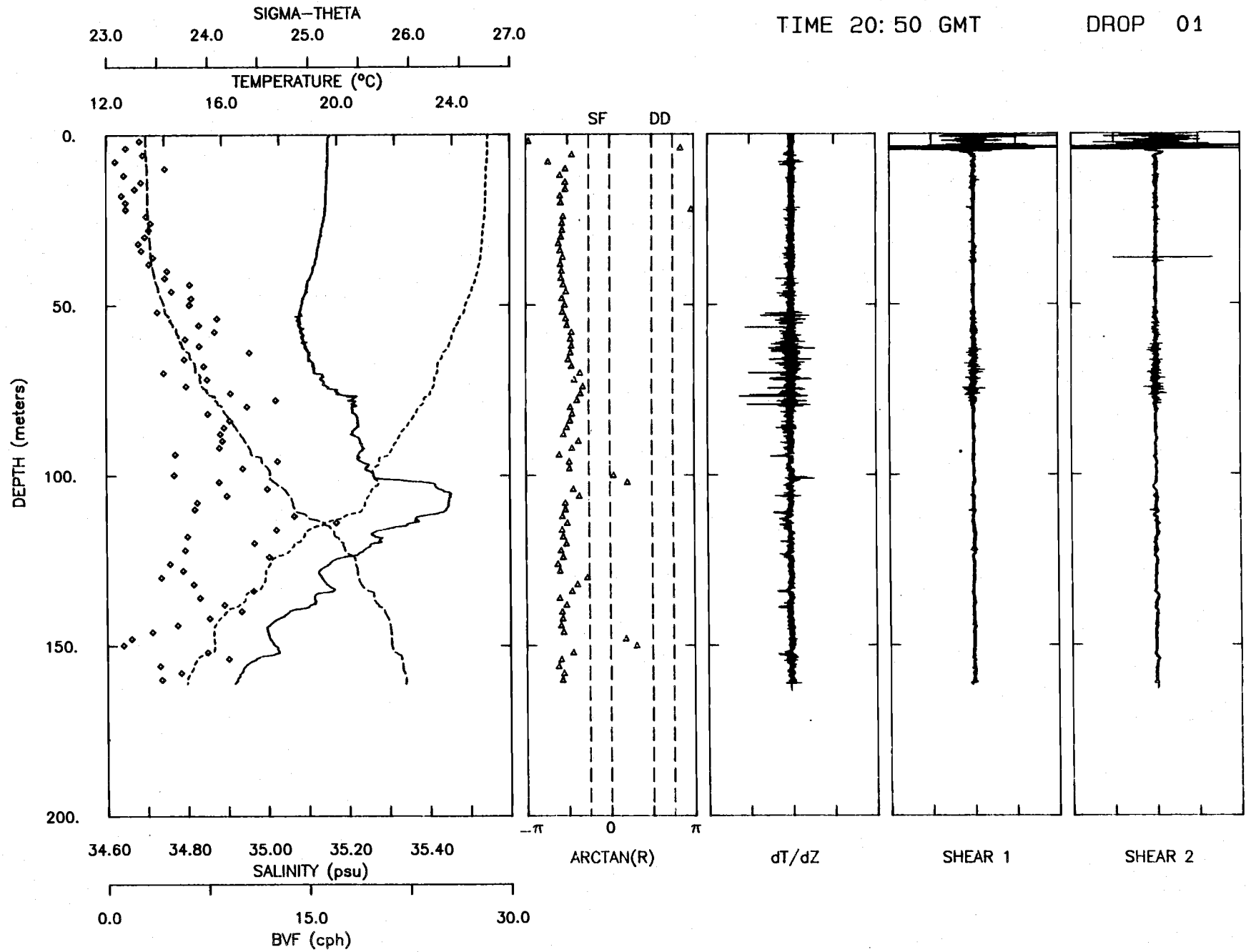
DATE 11/30/84
TIME 19:59 GMT

TAPE 178
DROP 07



DATE 11/30/84
TIME 20:50 GMT

TAPE 179
DROP 01

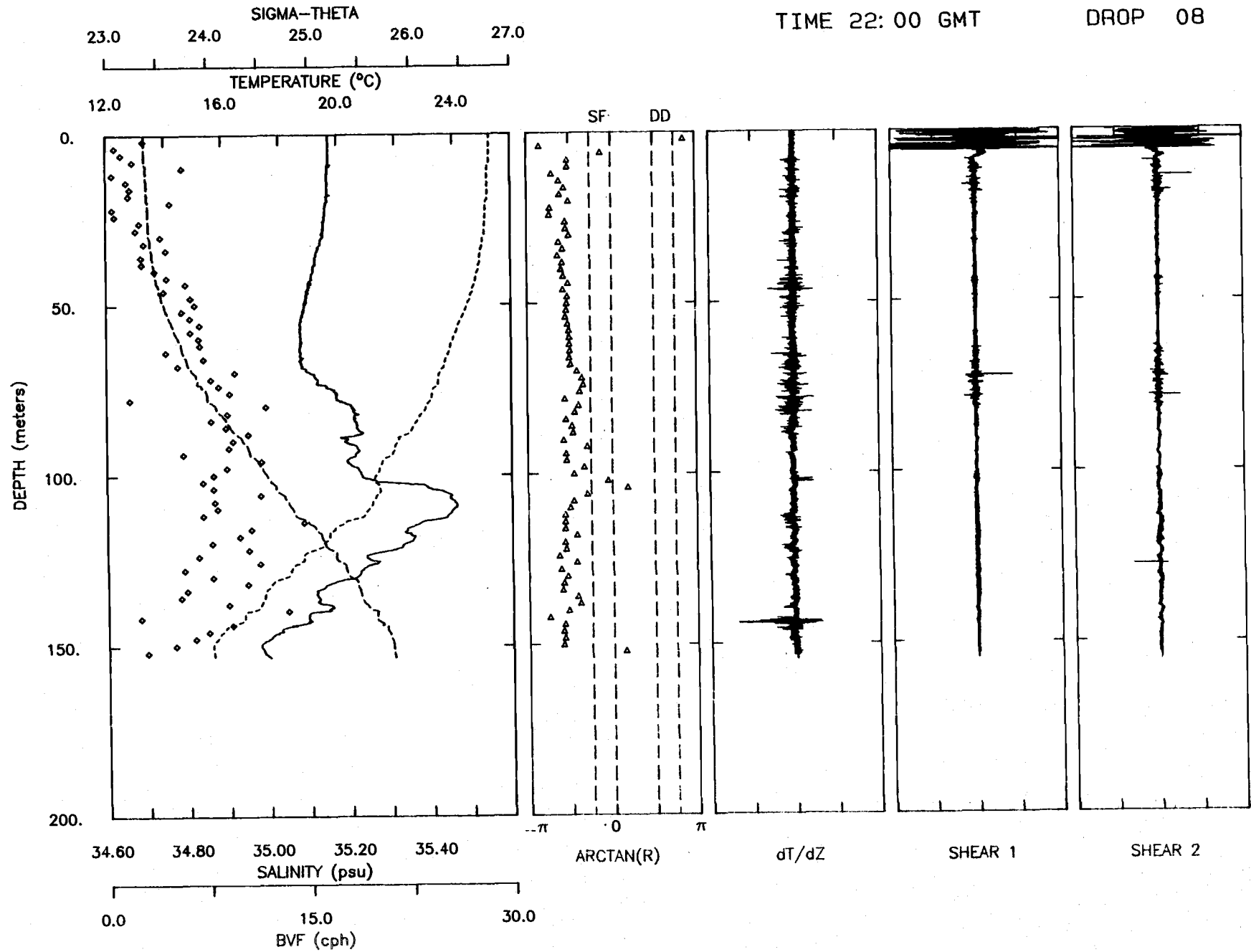


DATE 11/30/84

TAPE 179

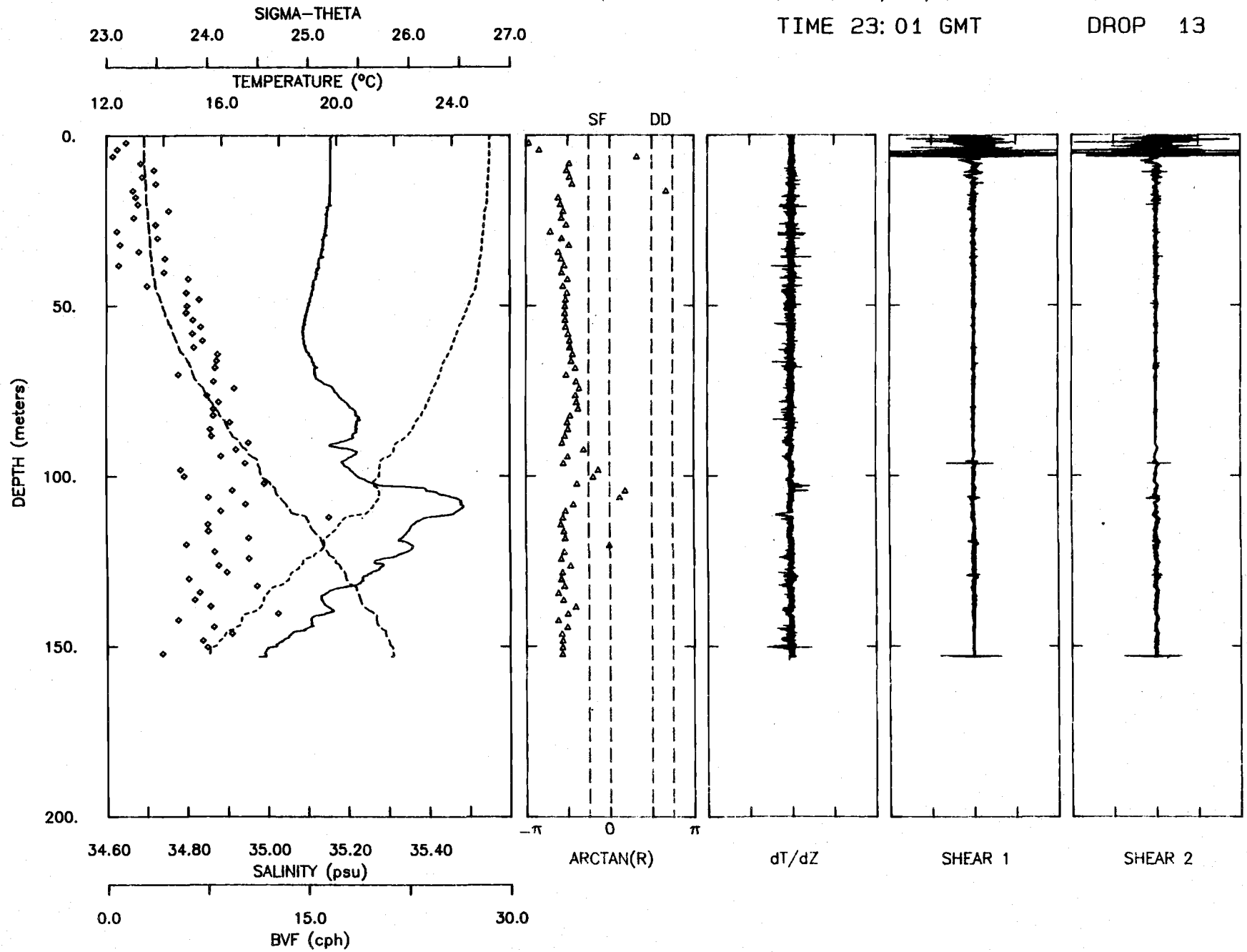
TIME 22:00 GMT

DROP 08



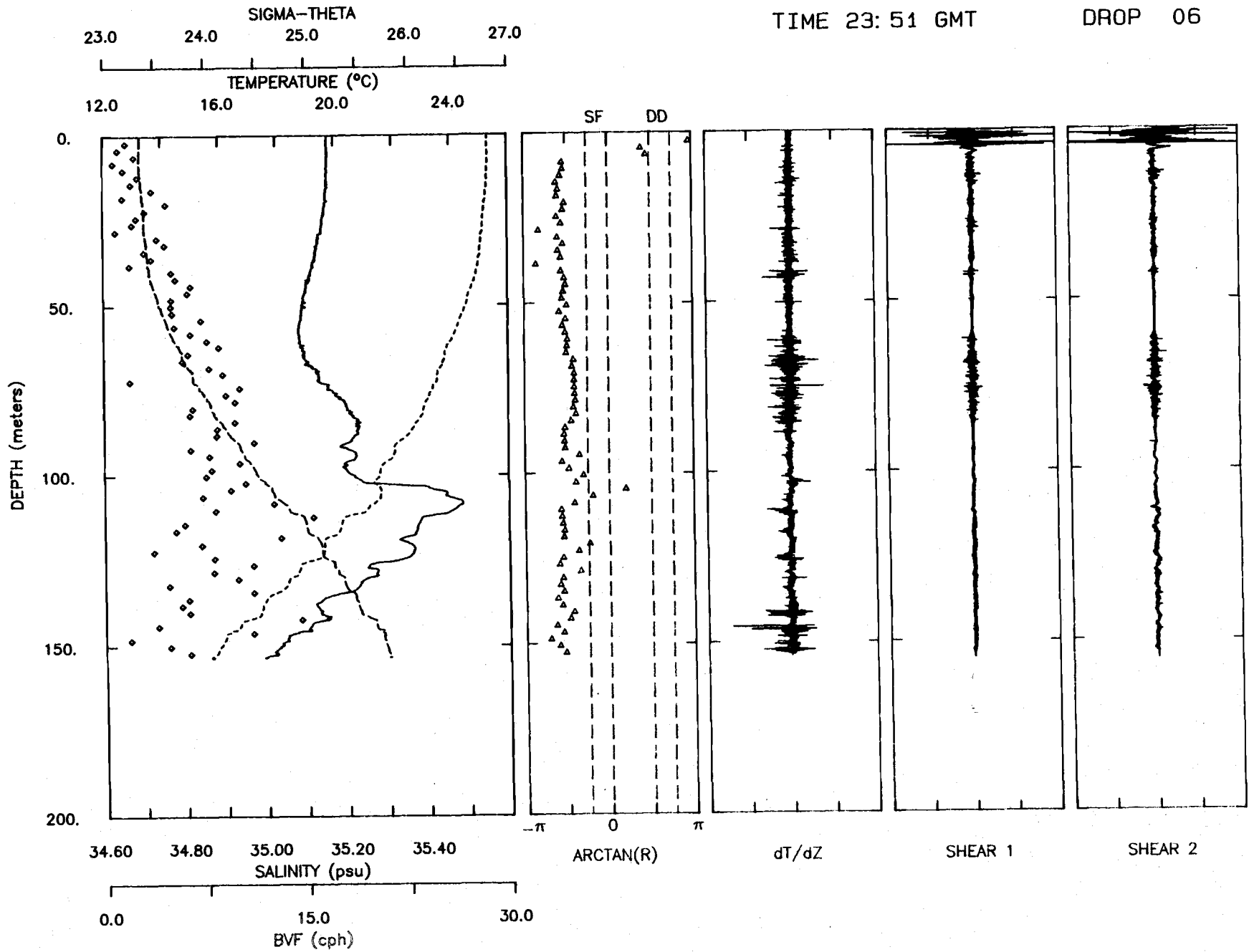
DATE 11/30/84
TIME 23:01 GMT

TAPE 179
DROP 13



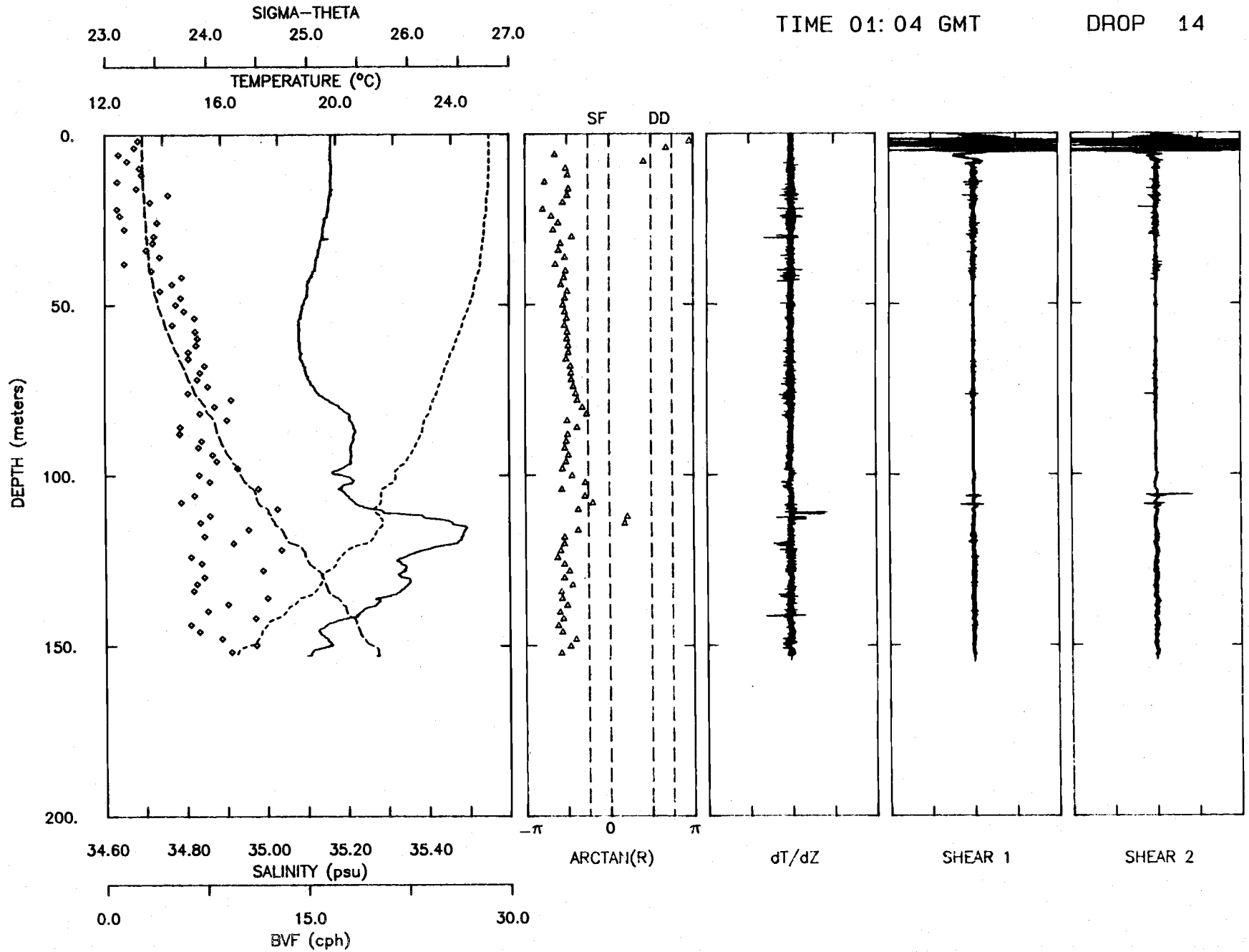
DATE 11/30/84
TIME 23:51 GMT

TAPE 180
DROP 06



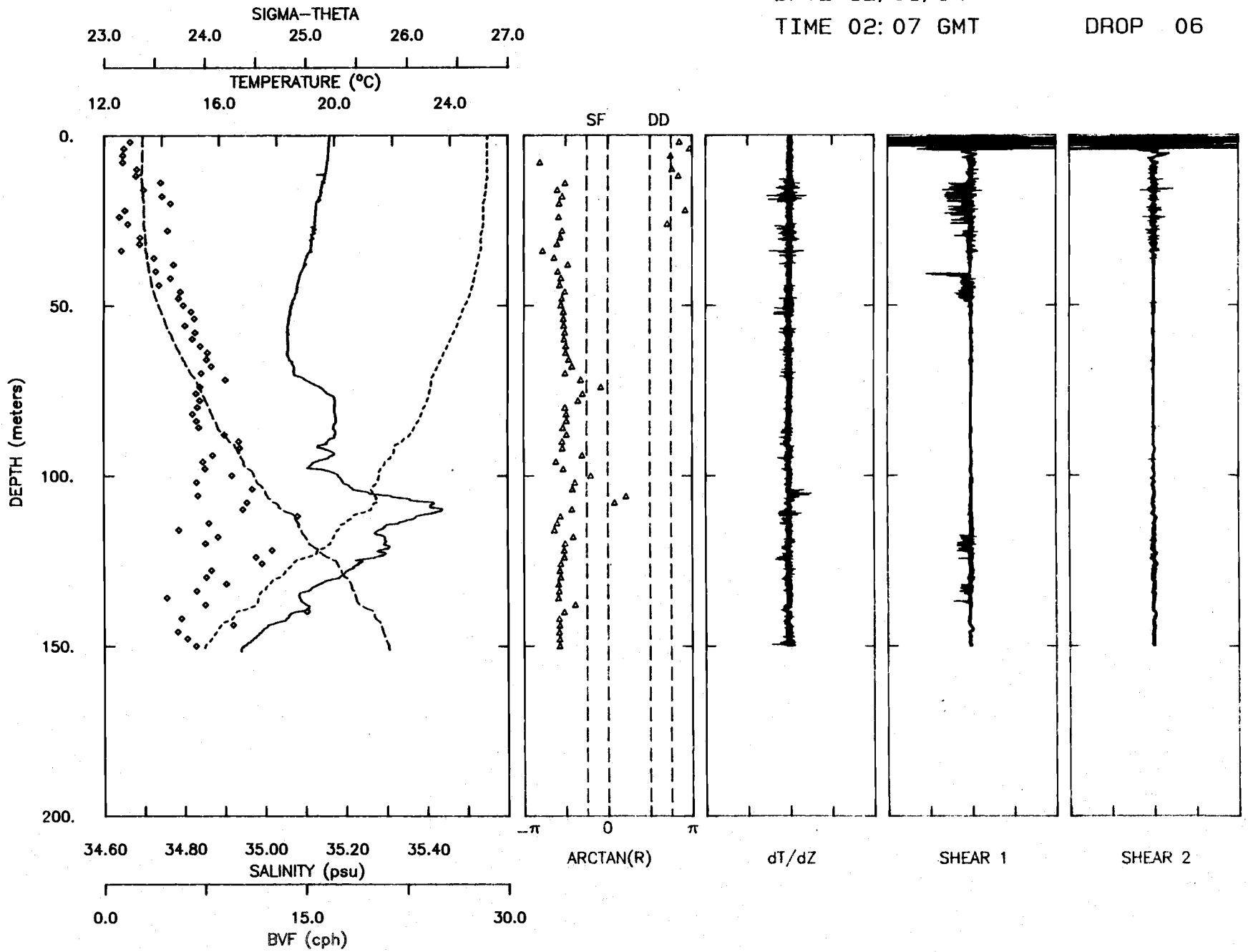
DATE 12/01/84
TIME 01:04 GMT

TAPE 180
DROP 14



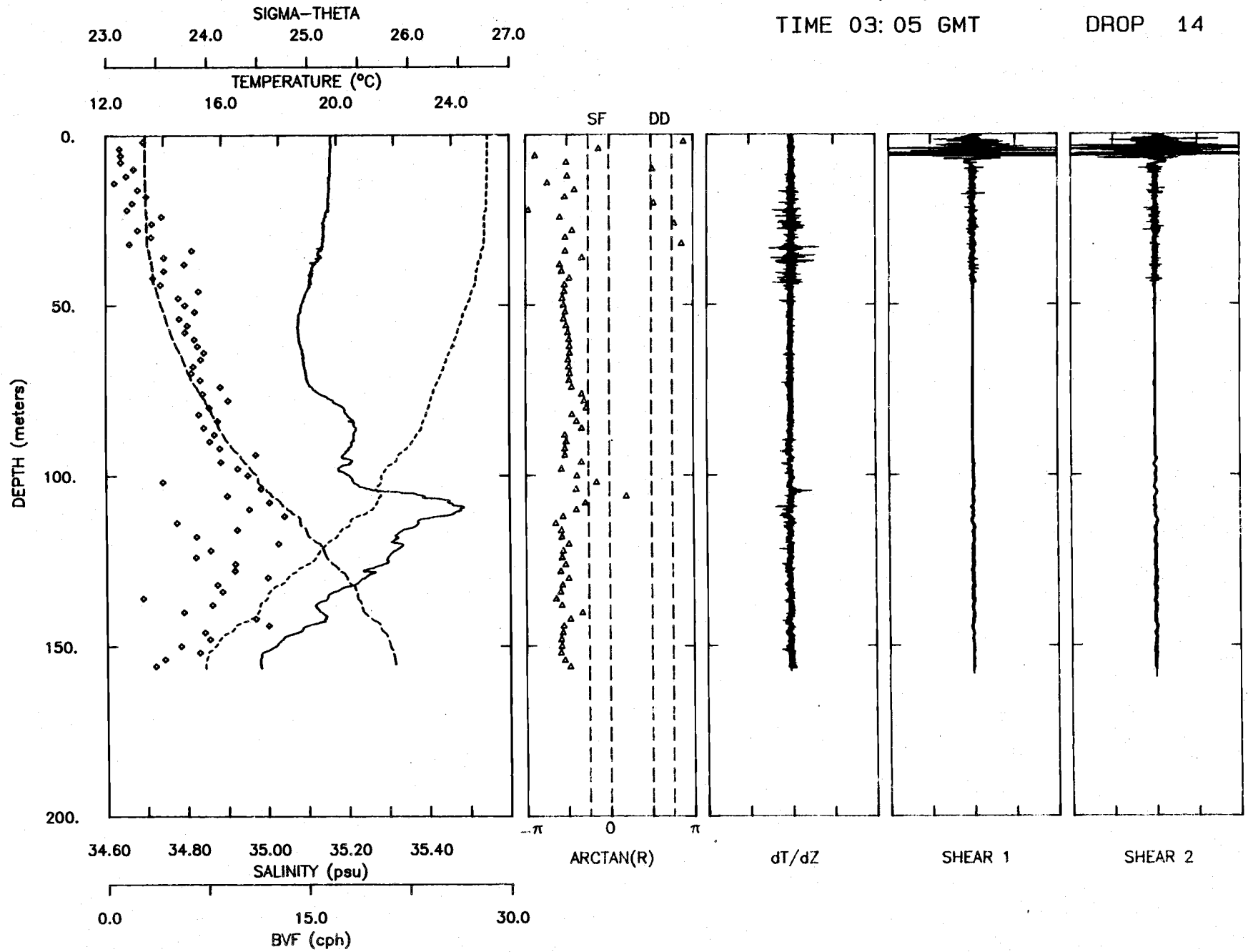
DATE 12/01/84
TIME 02:07 GMT

TAPE 181
DROP 06



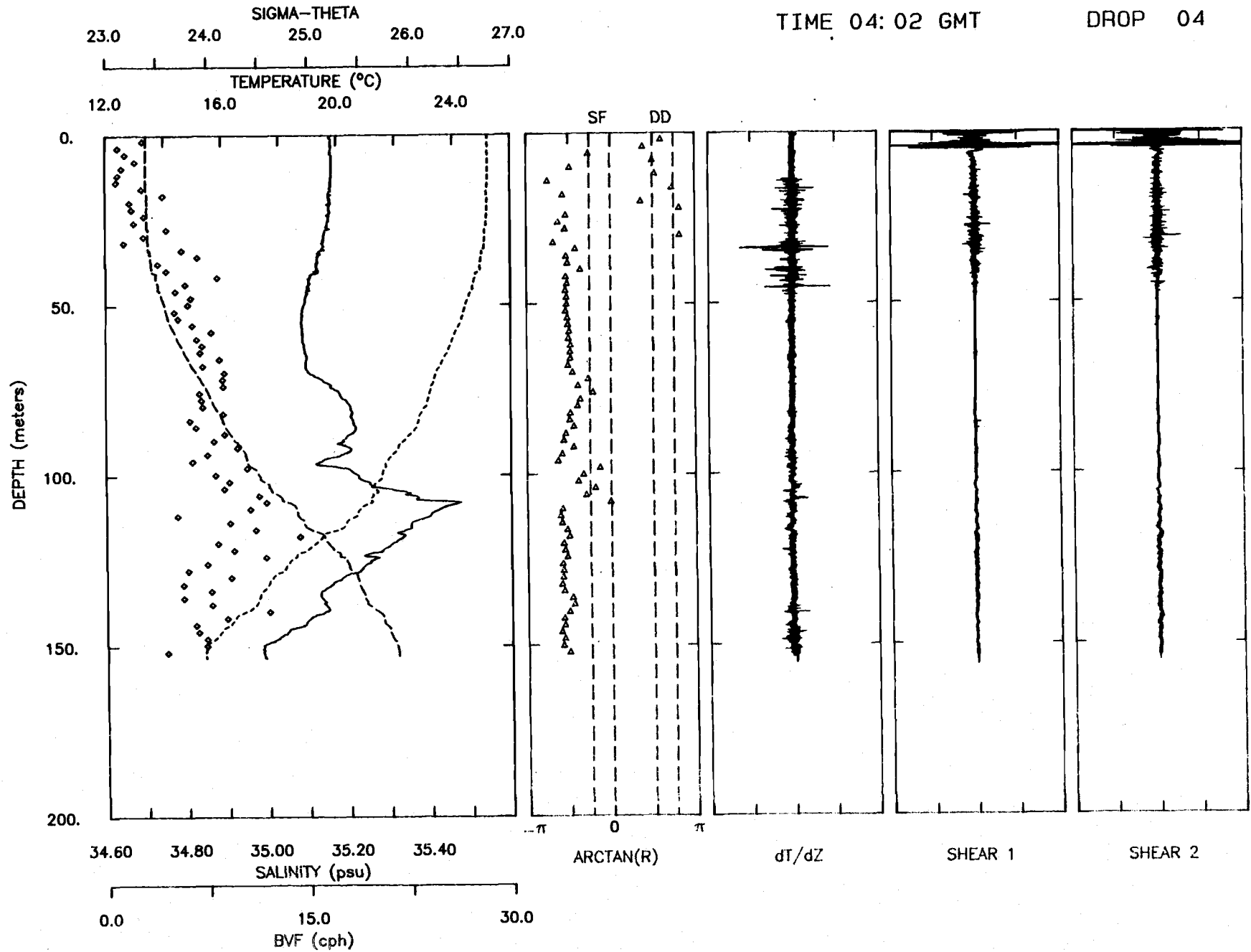
DATE 12/01/84
TIME 03:05 GMT

TAPE 181
DROP 14



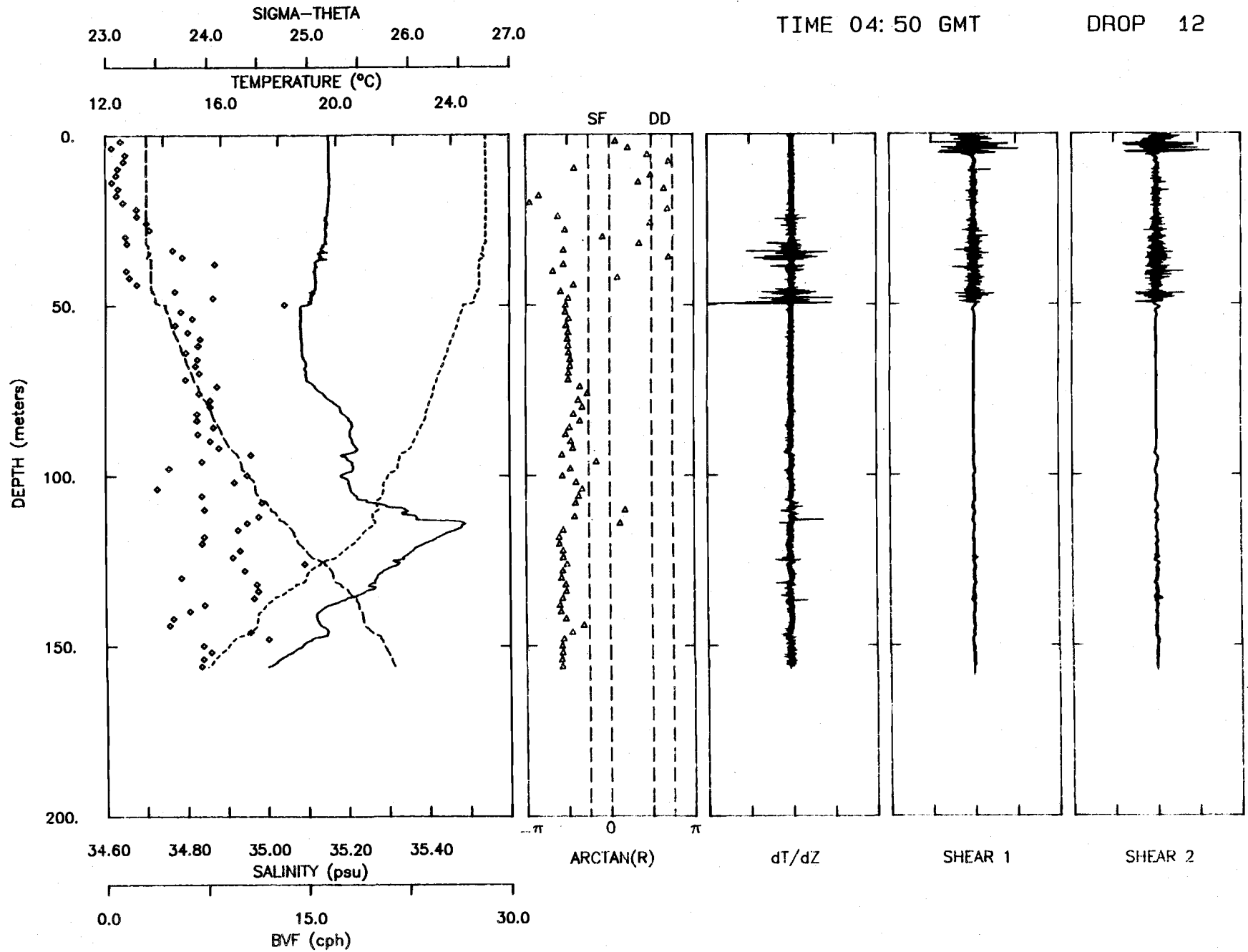
DATE 12/01/84
TIME 04:02 GMT

TAPE 182
DROP 04



DATE 12/01/84
TIME 04:50 GMT

TAPE 182
DROP 12

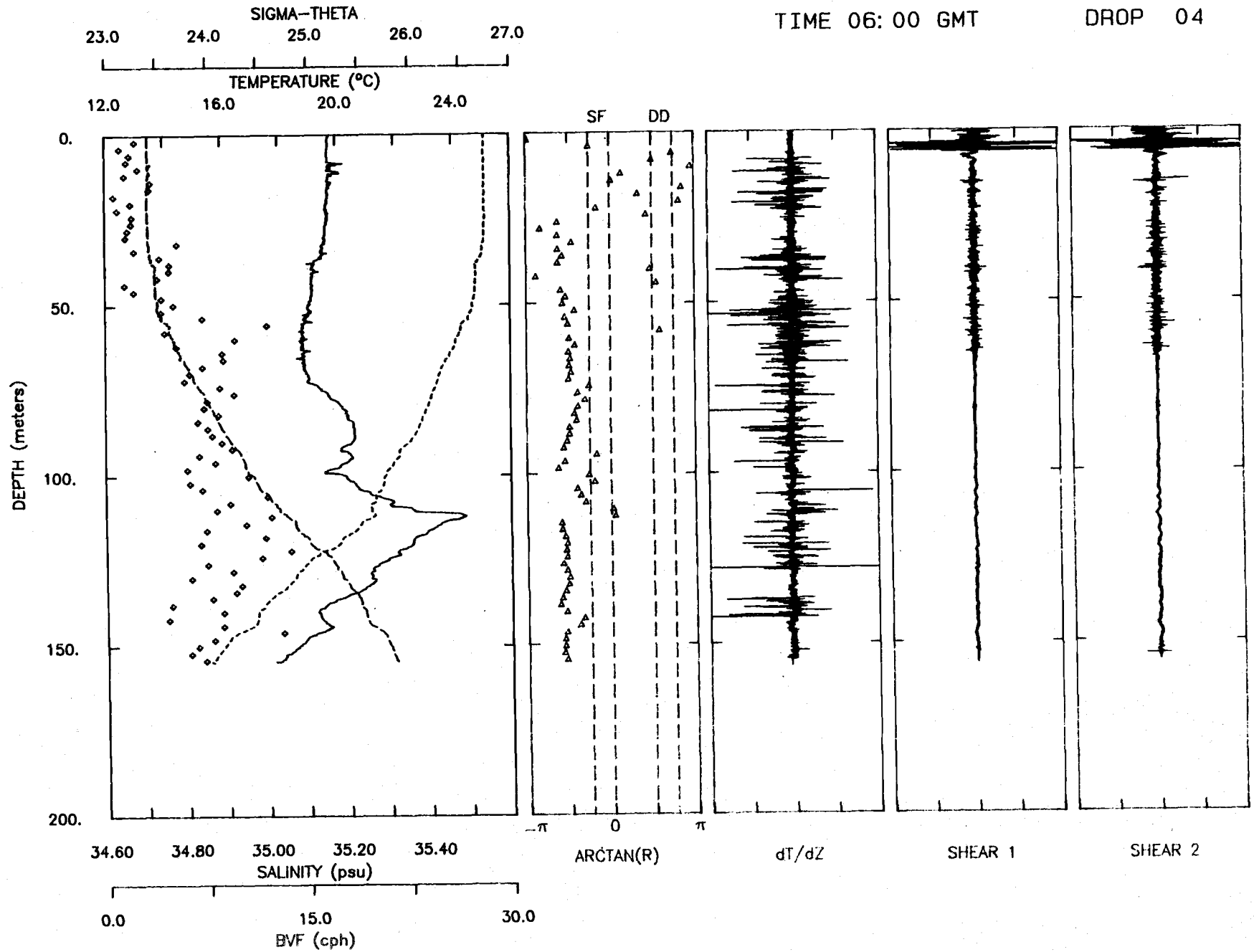


DATE 12/01/84

TAPE 183

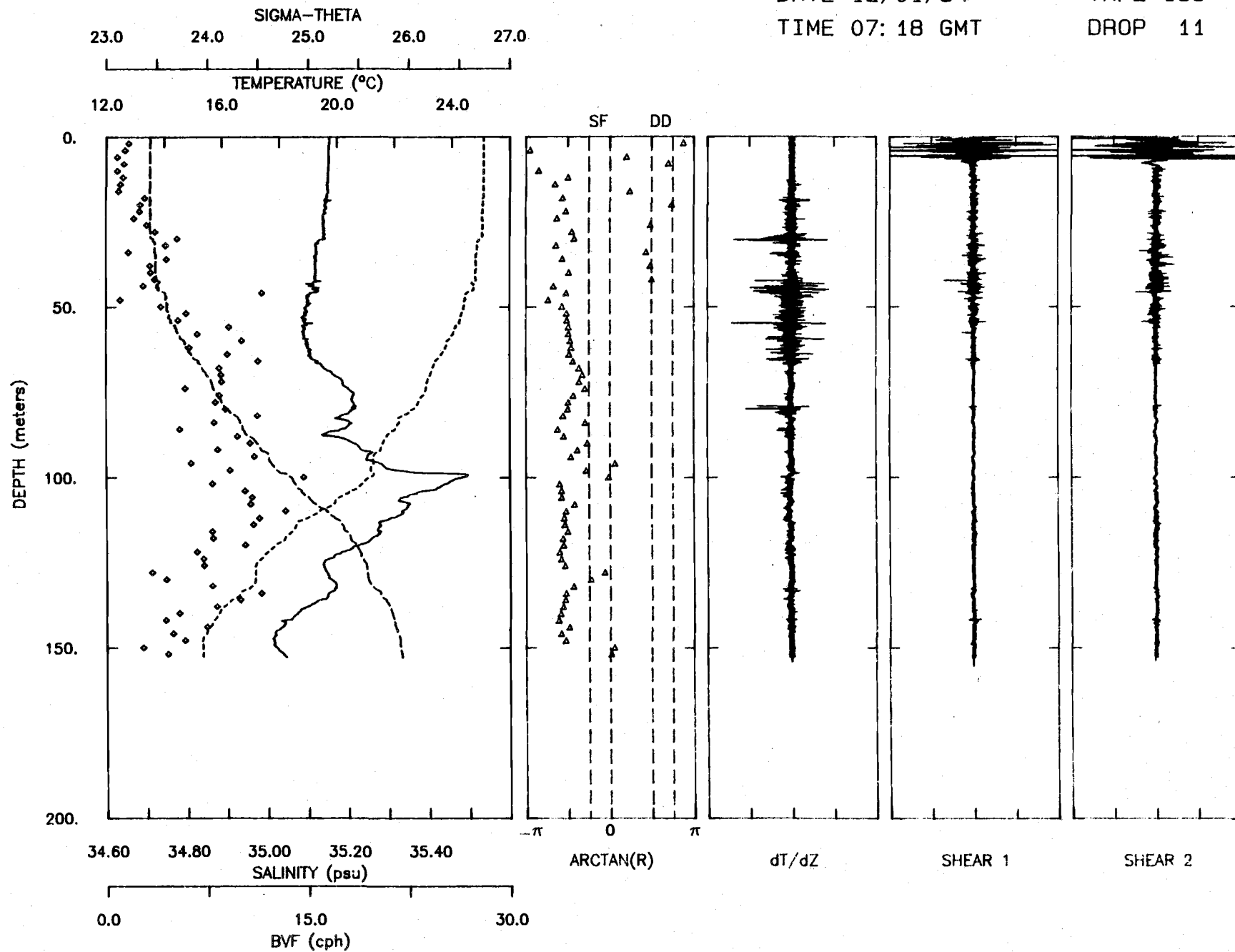
TIME 06:00 GMT

DROP 04



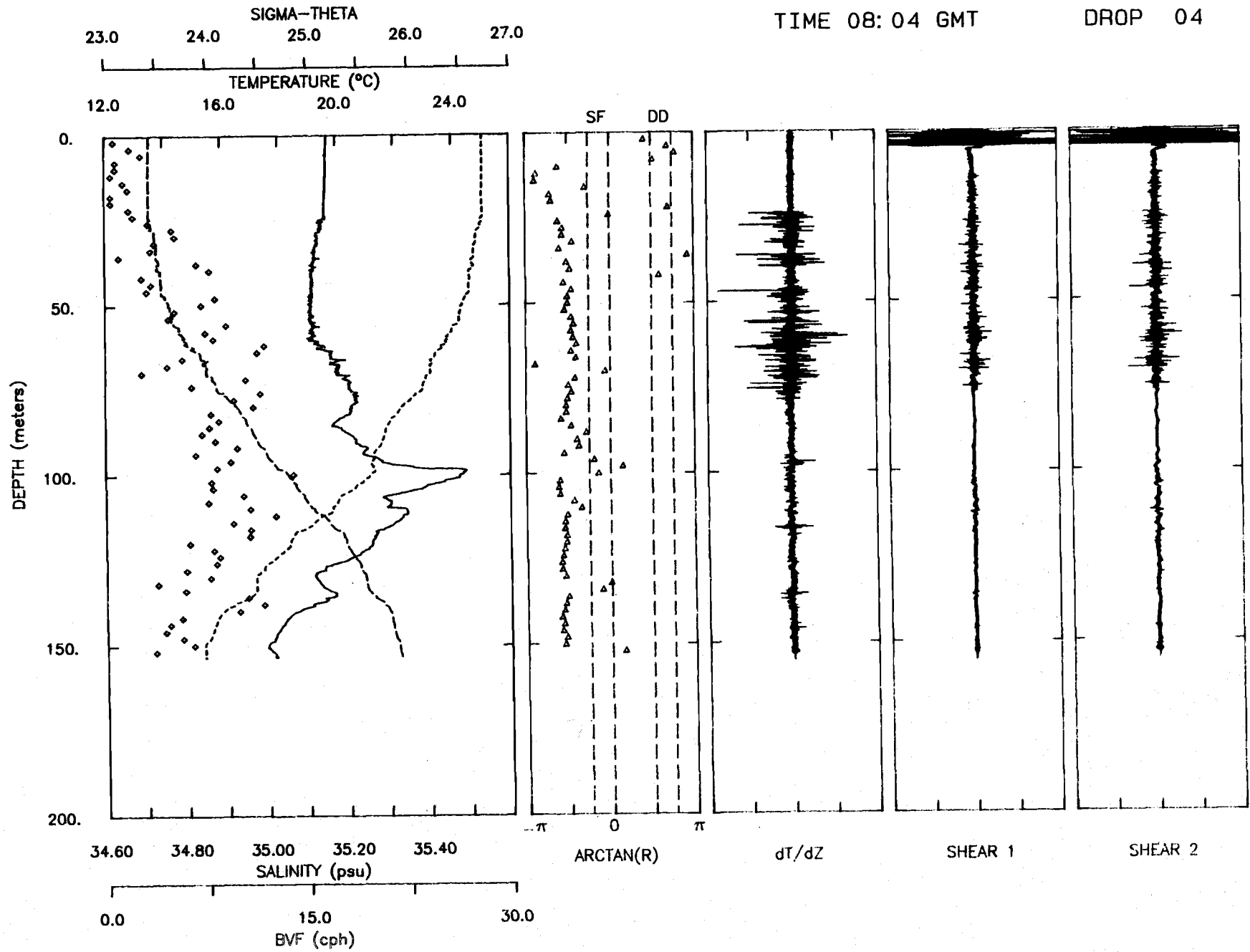
DATE 12/01/84
TIME 07:18 GMT

TAPE 183
DROP 11



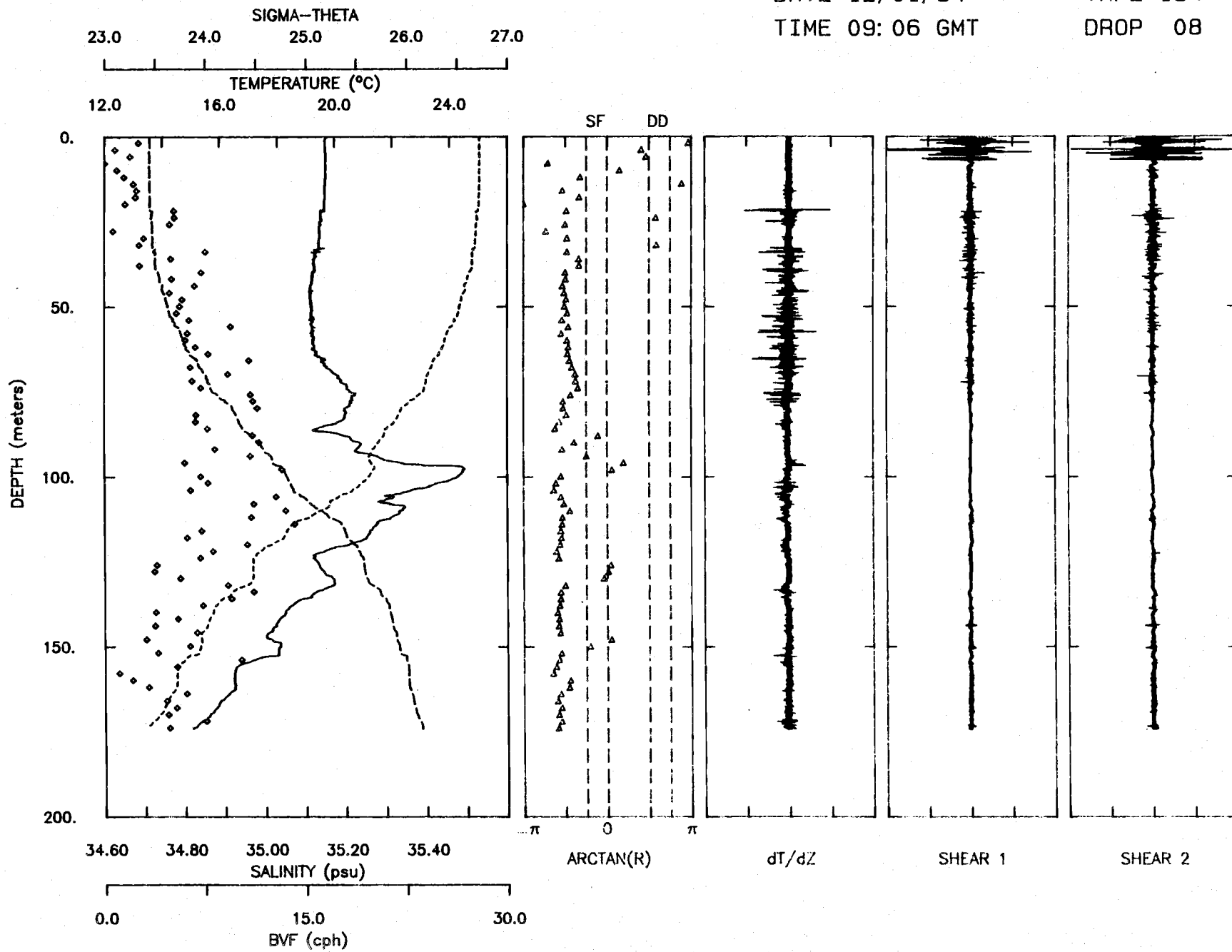
DATE 12/01/84
TIME 08:04 GMT

TAPE 184
DROP 04



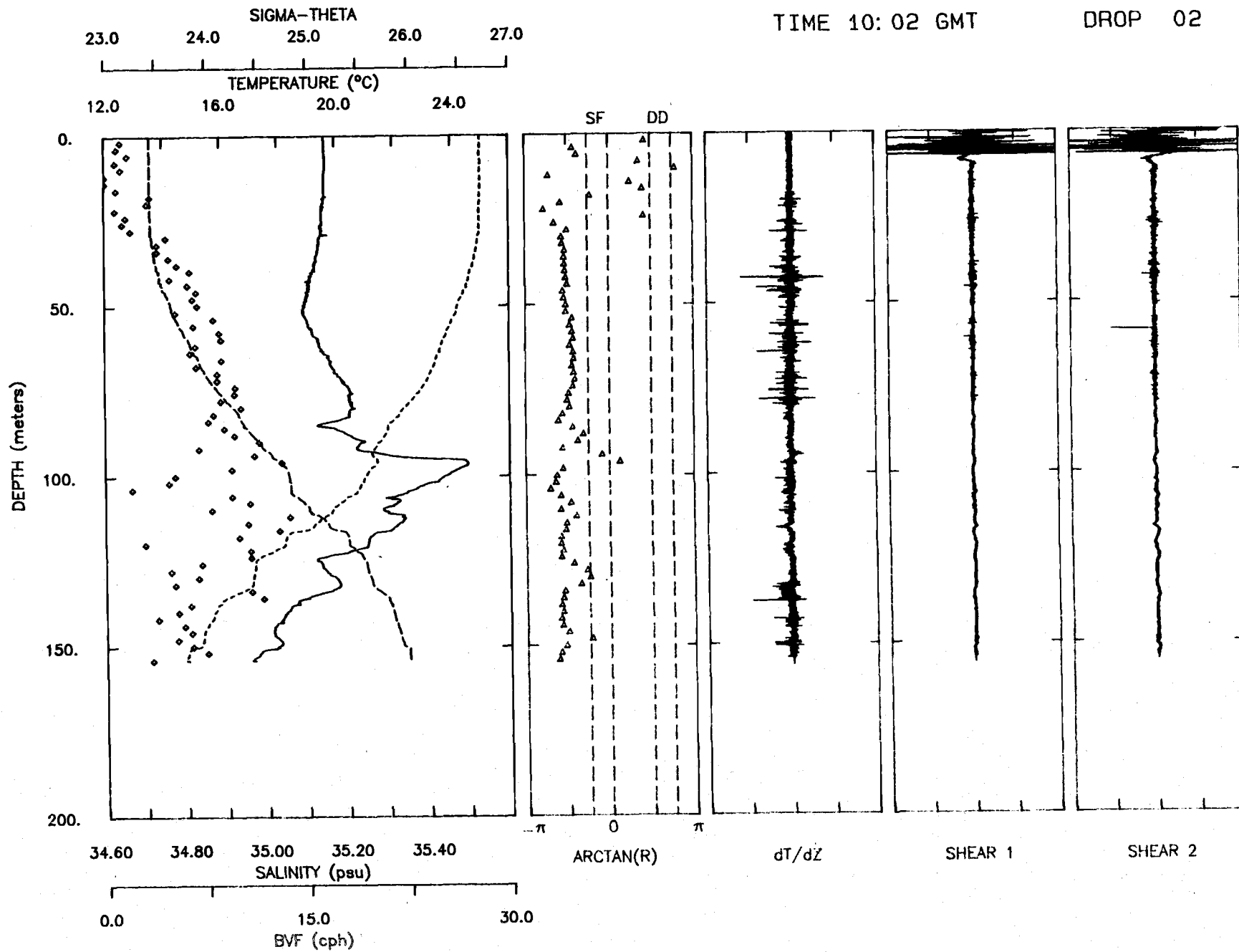
DATE 12/01/84
TIME 09:06 GMT

TAPE 184
DROP 08



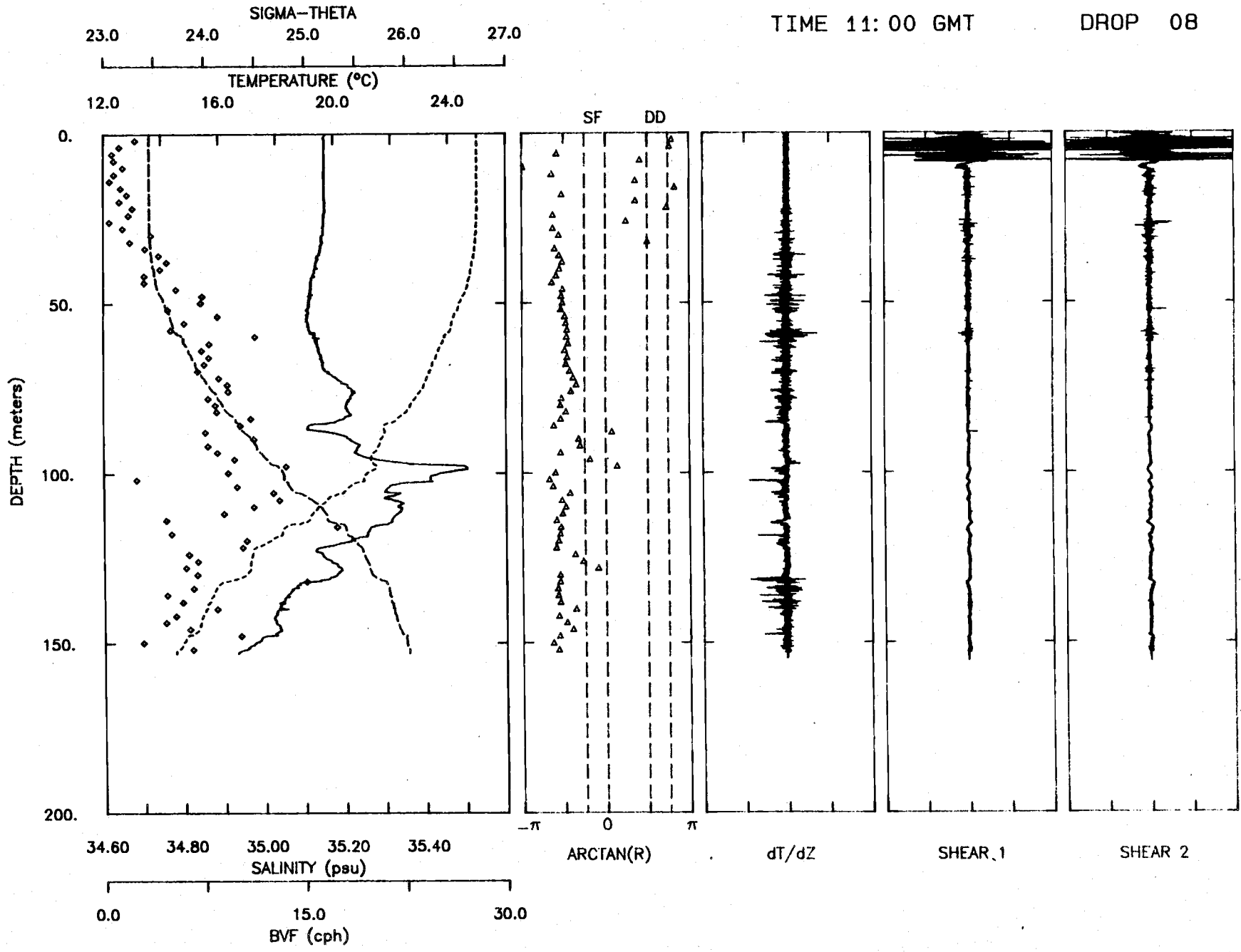
DATE 12/01/84
TIME 10:02 GMT

TAPE 185
DROP 02



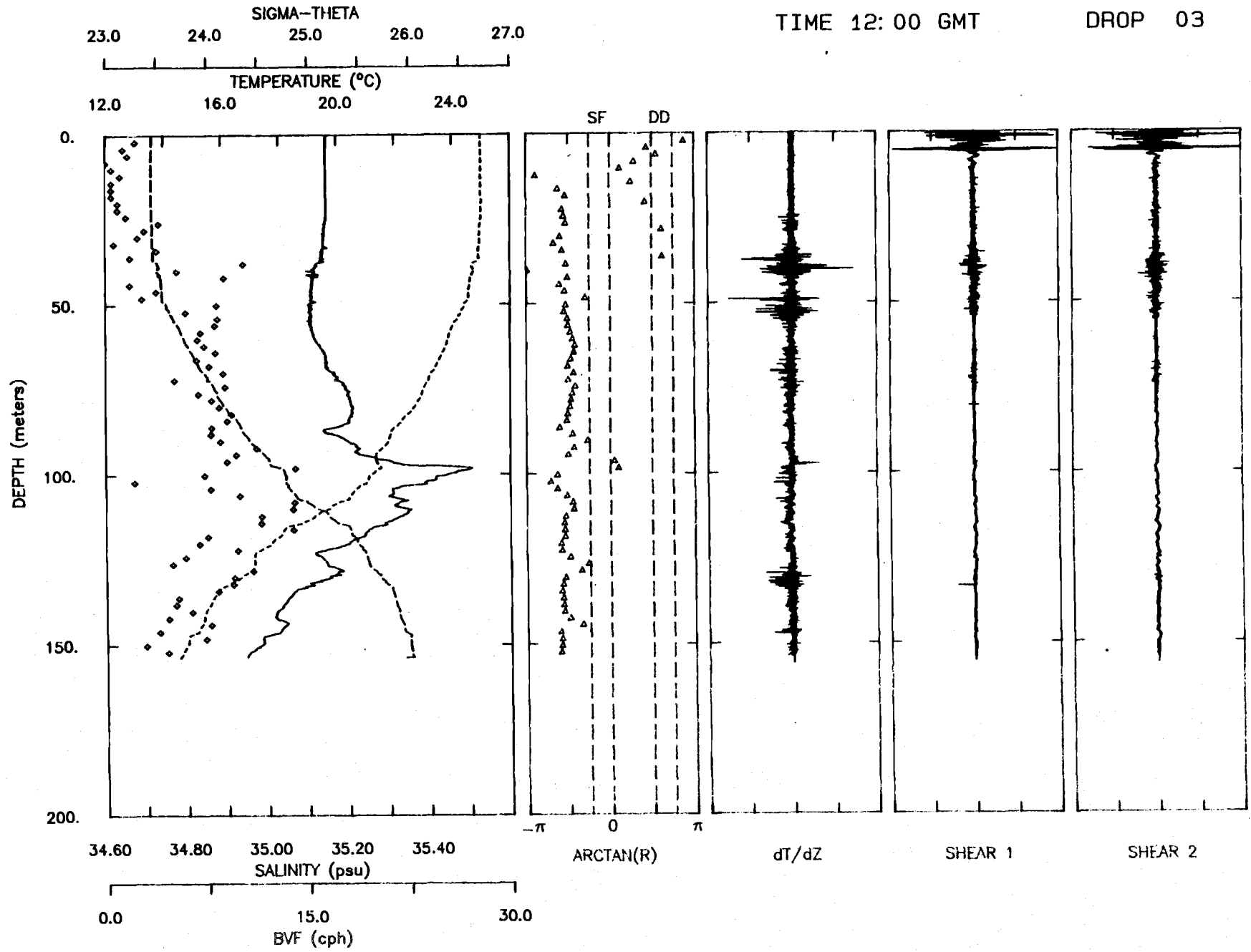
DATE 12/01/84
TIME 11:00 GMT

TAPE 185
DROP 08



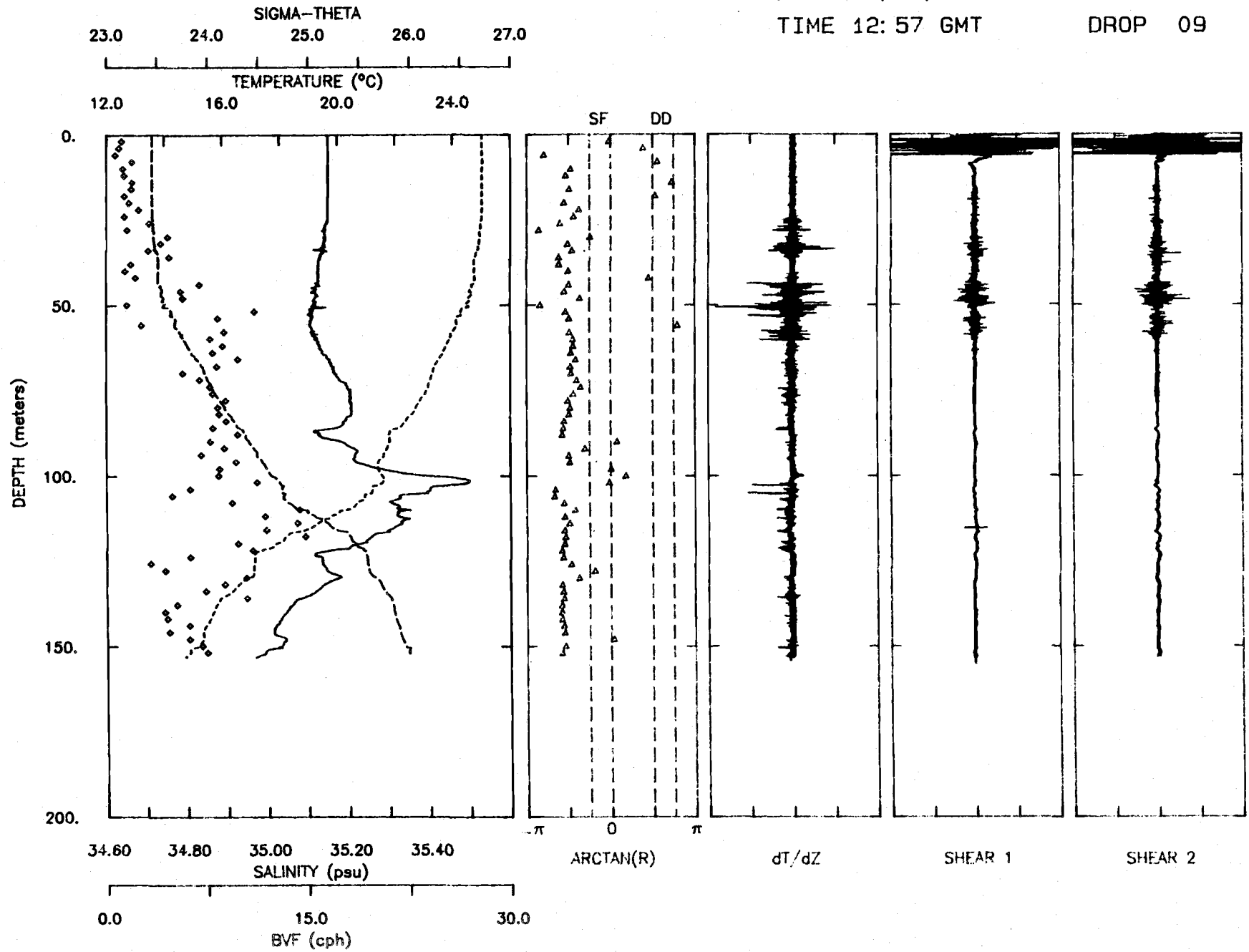
DATE 12/01/84
TIME 12:00 GMT

TAPE 186
DROP 03



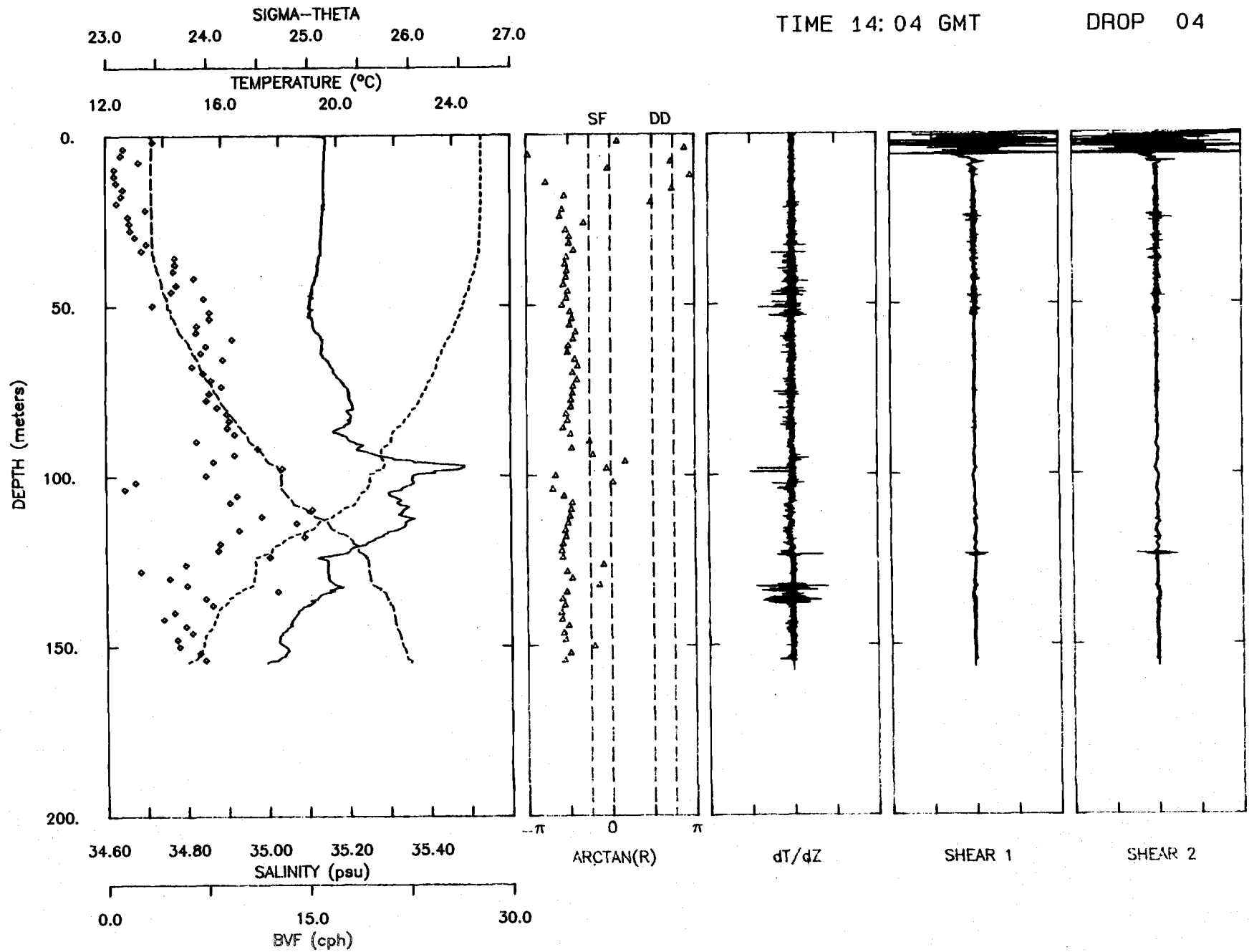
DATE 12/01/84
TIME 12:57 GMT

TAPE 186
DROP 09



DATE 12/01/84
TIME 14:04 GMT

TAPE 187
DROP 04

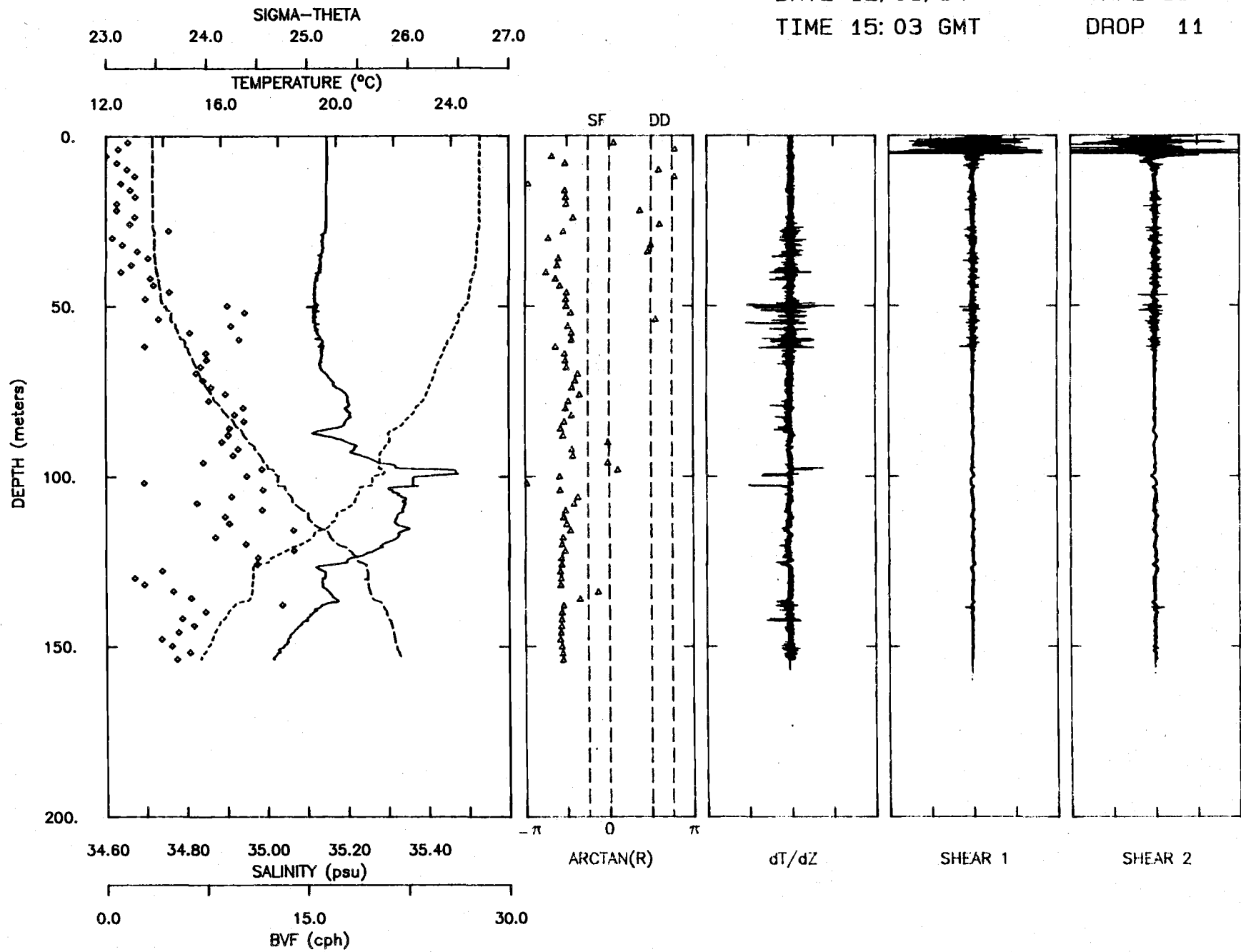


DATE 12/01/84

TAPE 187

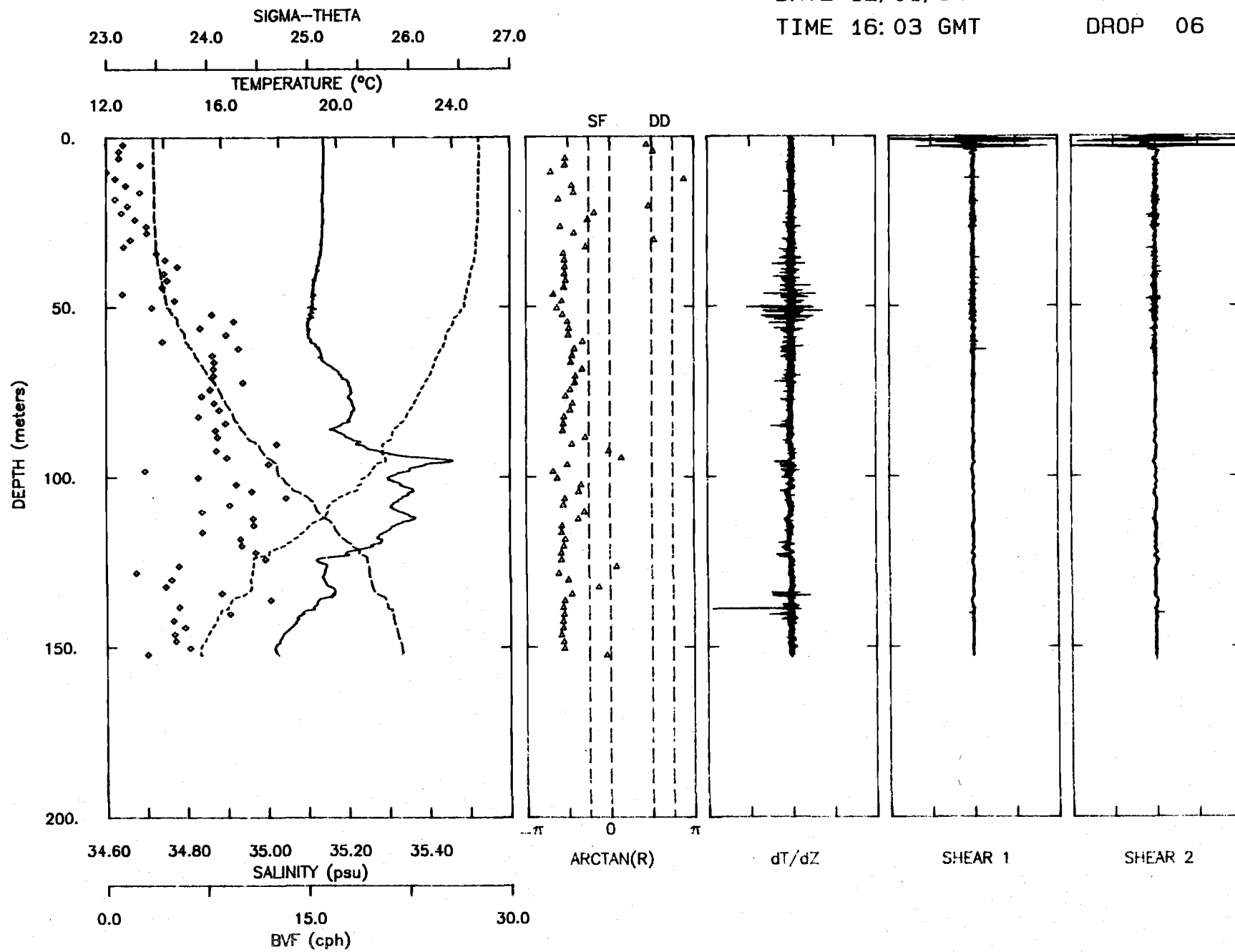
TIME 15:03 GMT

DROP 11



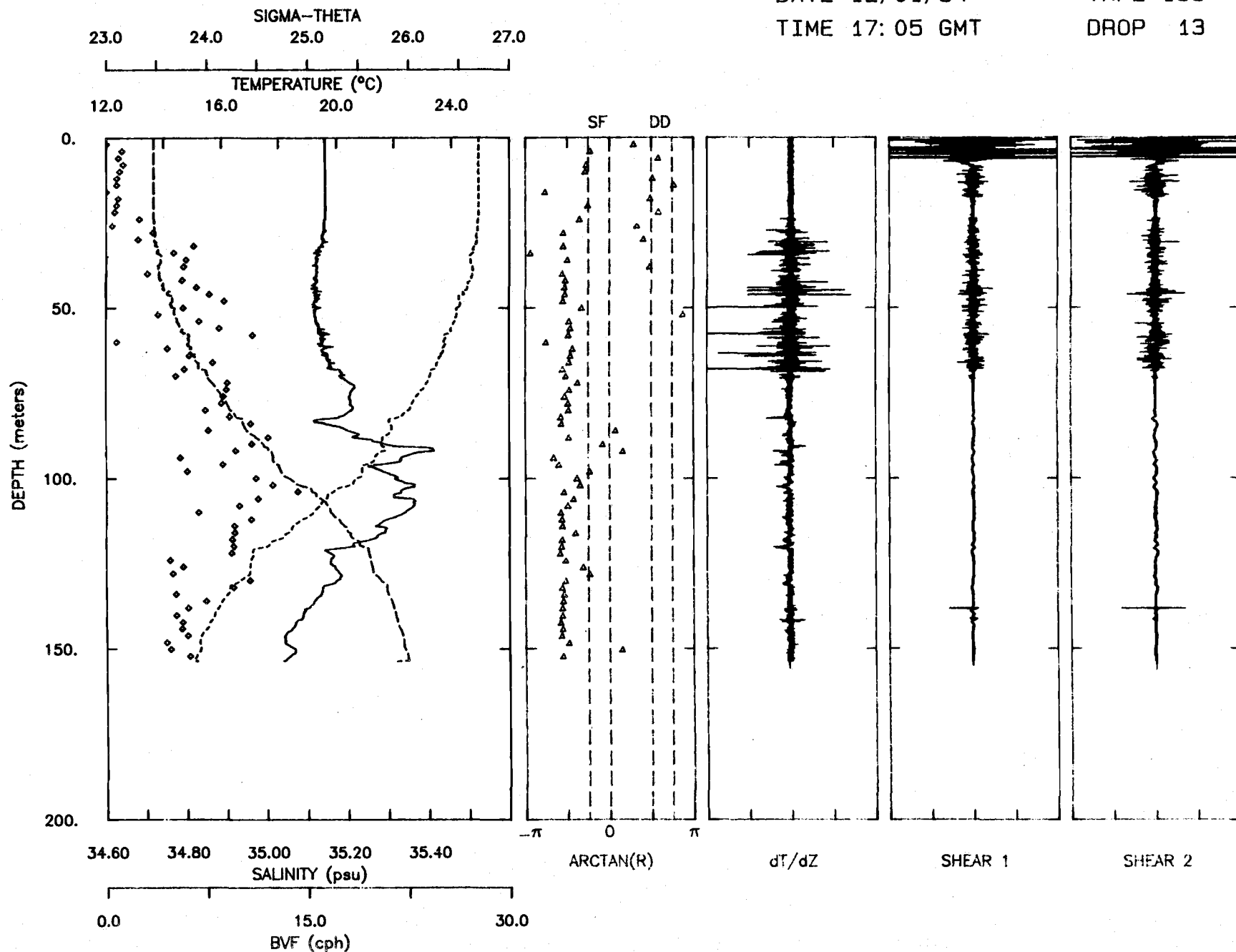
DATE 12/01/84
TIME 16:03 GMT

TAPE 188
DROP 06



DATE 12/01/84
TIME 17:05 GMT

TAPE 188
DROP 13

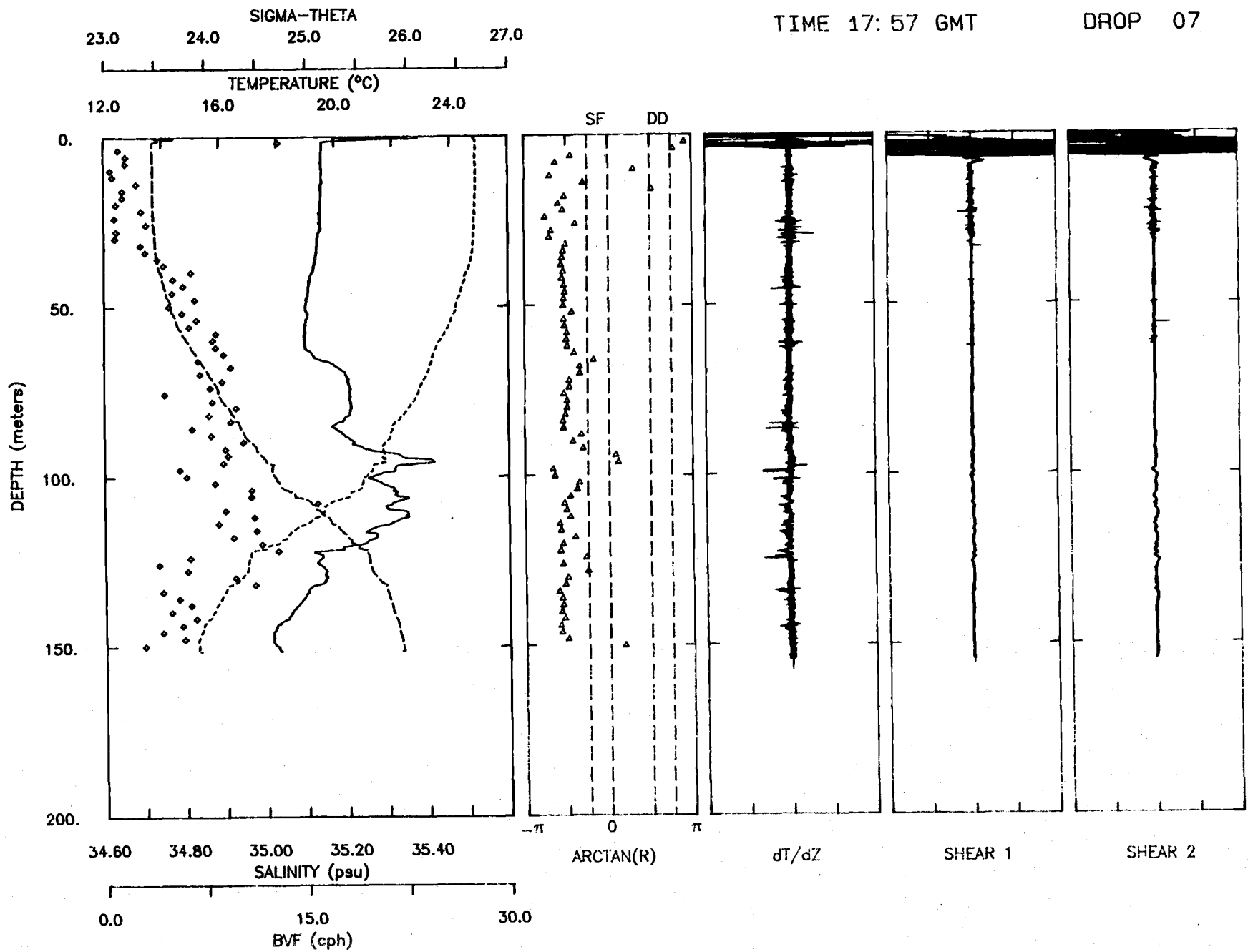


DATE 12/01/84

TAPE 189

TIME 17:57 GMT

DROP 07



REFERENCES

- Caldwell, D.R., T.M. Dillon, and J.N. Moum (1985): The Rapid Sampling Vertical Profiler - an evaluation. *J. Ocean Atmos. Tech.*, - to appear in the December, 1985 issue.
- Chereskin, T.K., C.A. Paulson, and R.E. Schramm (1985): CTD observations during TROPIC HEAT - 9 November to 3 December, 1984. Ref. 85-3, College of Oceanography, Oregon State University, Corvallis, OR 97331.
- Eriksen, C.C. (1985): The TROPIC HEAT Program: an overview. *EOS*, 6, 50-52.
- Moum, J.N., and D.R. Caldwell (1985): Local effects on shear-flow turbulence in the equatorial ocean. *Science*, 230, 315-316.
- Moum, J.N., D.R. Caldwell, C.A. Paulson, T.K. Chereskin, and L.A. Regier (1985): Does ocean turbulence peak at the equator? Submitted to *Nature*.
- Newberger, P.A., D.R. Caldwell, T.M. Dillon, J.L. Cantey, S.D. Wilcox, M.D. Brown, and H.H. Dannelongue (1984): The Rapid Sampling Vertical Profiler. Ref. 84-5, College of Oceanography, Oregon State University, Corvallis, OR 97331.
- Newberger, P.A., H.H. Dannelongue, D.R. Caldwell, T.M. Dillon, S.D. Wilcox, and J.L. Cantey (1983): The Rapid Sampling Vertical Profiler, test cruise, July 1982 "FRONTS 82". Ref. 83-9, College of Oceanography, Oregon State University, Corvallis, OR 97331.
- Ninnis, R.M. (1984): The effects of spatial averaging on airfoil probe measurements of oceanic velocity microstructure. Ph.D. thesis, University of British Columbia, Vancouver, B.C., Canada.
- Osborn, T.R., and W.R. Crawford (1980): An airfoil probe for measuring turbulent velocity fluctuations in water. Chapter 19 in 'Air-Sea Interaction: Instruments and Methods'. Ed. by F. Dobson, L. Hasse, and R. Davis, Plenum Press, New York.
- Turner, J.S. (1973): 'Buoyancy Effects in Fluids'. Cambridge University Press.