

2746
 APPLIED GEOMECHANICS INC.
 CALIBRATION CERTIFICATE
 Model 801-ST, Serial Number 2746
 Single Ended
 Transverse Orientation
 Date: 11-13-2008

Calibrated by: DD

TILT CALIBRATION

Theta	Tilt-Out
-2.89	-4714.80
-2.65	-4389.10
-2.41	-4042.80
-2.17	-3681.40
-1.93	-3302.60
-1.69	-2914.10
-1.45	-2516.30
-1.20	-2113.70
-0.96	-1696.00
-0.72	-1275.50
-0.48	-855.40
-0.24	-428.00
0.00	-0.60
0.24	424.90
0.48	830.80
0.72	1257.40
0.96	1684.30
1.20	2092.70
1.45	2494.50
1.69	2883.90
1.93	3258.70
2.17	3622.70
2.41	3970.80
2.65	4306.80
2.89	4618.80

Theta is reported in: Arc Degrees
 Tilt outputs above are reported in Millivolts.
 Calibration temperature = 24.1 deg. C

Scale Factors are determined by linear regression of all data points for each axis of calibration.

SCALE FACTOR = 0.59875 Arc Degrees/V
 Maximum nonlinearity (% of full span) = 2.00193

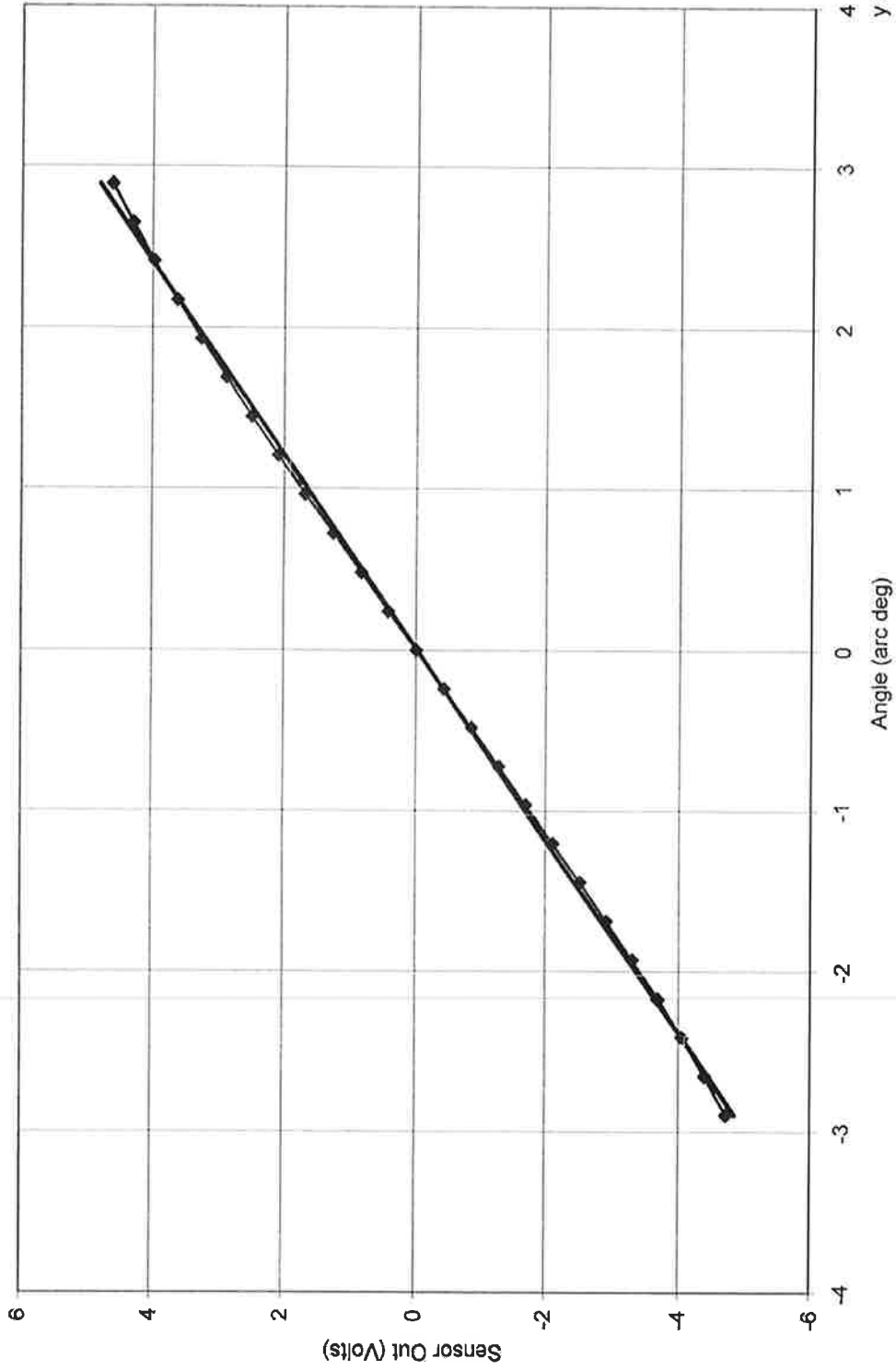
Calibration curves fit a polynomial of form:
 Theta = a + bv + cv**2 + dv**3 + ev**4 + fv**5 where v = Tilt output

	POLYNOMIAL FIT COEFFICIENTS					
TILT	a	b	c	d	e	f
	0.0	10442.5	0.0	0.0	0.0	0.0

The above coefficients are for a 1st order fit.

Model 801-S/T, Serial No.2746
Calibration Temperature = 24.1
Single-ended Scale Factor = 0.59875 arc degrees/Volt

Series1
Linear (Series1)



$y = 1.6701x - 0.0194$
 $R^2 = 0.9993$

Appendix A. Custom Specifications for Your Equipment; Connectors and Wiring

Serial number: 2747

- Model 801-H/L [High-gain ($\pm 0.5^\circ$ range), Longitudinal configuration]
- Model 801-H/T [High-gain ($\pm 0.5^\circ$ range), Transverse configuration]
- Model 801-S/L [Standard ($\pm 3^\circ$ range), Longitudinal configuration]
- Model 801-S/T [Standard ($\pm 3^\circ$ range), Transverse configuration]
- Model 801-W/L [Wide-angle ($\pm 50^\circ$ range), Longitudinal configuration]
- Model 801-W/T [Standard ($\pm 50^\circ$ range), Transverse configuration]

Scale Factors

Single-ended tilt output is measured between the green and white wires in the tiltmeter cable (PN 70369). Differential output is measured between the green and blue wires (see table, next page). The scale factor for differential output is one half the scale factor for single-ended output. Scale factors are determined by linear regression with a minimum of 10 steps over the calibration range. Nonlinearity is the maximum deviation of any point from the regression line, divided by the calibration span (± 0.5 degree angular range = 1.0 degree span), expressed as percent.

Calibration Data For Your Tiltmeter					
The scale factor below is: <input checked="" type="checkbox"/> single-ended <input type="checkbox"/> differential					
SCALE FACTOR	0.60419	radians/mV	arc second/mV	arc minute/mV	<u>degree/volt</u>
Calibration Temperature	22.5	$^\circ$ Celsius			
Max. nonlinearity	0.69	%			
Calibrated over Angular Range of	± 2.9	radians	arc second	arc minute	<u>degrees</u>

Temperature sensor output (single-ended only) is measured between the yellow and white wires in the tiltmeter cable. Temperature sensor scale factor is $0.1^\circ\text{C}/\text{mV}$. $0 \text{ mV} = 0^\circ\text{C}$

Filter

Your tiltmeter has a two-pole Butterworth low-pass filter with a roll-off of 12dB per octave (40 dB/decade) above the corner frequency. The time constant (τ) for the filter is listed below. 90% settling time is three time constants. Corner or cutoff frequency (f_c) can be calculated as: $f_c = 1/(2\pi\tau)$.

$$\tau = \underline{1.75} \text{ seconds}$$

Cable Color Coding			
Wire Color (Model 870 Cable P/N 70308)	Wire Color (PN 70369 Tiltmeter Cable)	Signal/Function	Connector Pin
Red	Red	+12 VDC	A
Orange	White	Signal ground	B
Gray	Black	Power ground	C
Green	Green	+Tilt out	D
—	Blue	-Tilt out	E
Yellow	Yellow	Temperature out	F

Signal and power grounds are common inside the tiltmeter.

Connector Part Nos.	
Connector on Model 801 Tiltmeter Cable (6-pin male receptacle)	P/N 62204
Connector on Model 870 Readout Module (6-socket female plug)	P/N 62202

ANGLE CONVERSION CHART						
	degrees	arc minutes	arc seconds	μ radians	mm/meter	inches/ft
1 degree =	1	60	3600	17453	17.453	0.2094
1 arc minute =	0.01667	1	60	290.9	0.2909	3.49×10^{-3}
1 arc second =	2.78×10^{-4}	0.01667	1	4.848	4.85×10^{-3}	5.82×10^{-5}
1 μ radian =	5.73×10^{-5}	3.44×10^{-3}	0.2063	1	0.001	1.20×10^{-5}
1 mm/meter =	0.0573	3.436	206.3	1000	1	0.0120
1 inch/ft =	4.775	286.5	17189	83333	83.33	1

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Theta	Tilt-Out
-2.89	-4714.30
-2.65	-4352.20
-2.41	-3972.80
-2.17	-3585.60
-1.93	-3199.60
-1.69	-2815.40
-1.45	-2414.60
-1.20	-2017.70
-0.96	-1608.90
-0.72	-1210.20
-0.48	-807.20
-0.24	-394.50
0.00	5.80
0.24	412.70
0.48	799.50
0.72	1213.20
0.96	1622.90
1.20	2025.10
1.45	2428.20
1.69	2821.20
1.93	3221.30
2.17	3622.30
2.41	4011.20
2.65	4376.50
2.89	4726.90

Theta is reported in: Arc Degrees
 Tilt outputs above are reported in Millivolts.
 Calibration temperature = 22.5 deg. C

Scale Factors are determined by linear regression of all data points for each axis of calibration.

SCALE FACTOR = 0.60419 Arc Degrees/V
 Maximum nonlinearity (% of full span) = 0.68838

Calibration curves fit a polynomial of form:
 Theta = a + bV + cV**2 + dV**3 + eV**4 + fV**5 where V = Tilt output

	POLYNOMIAL FIT COEFFICIENTS					
TILT	a	b	c	d	e	f
	0.0	10544.1	0.0	0.0	0.0	0.0

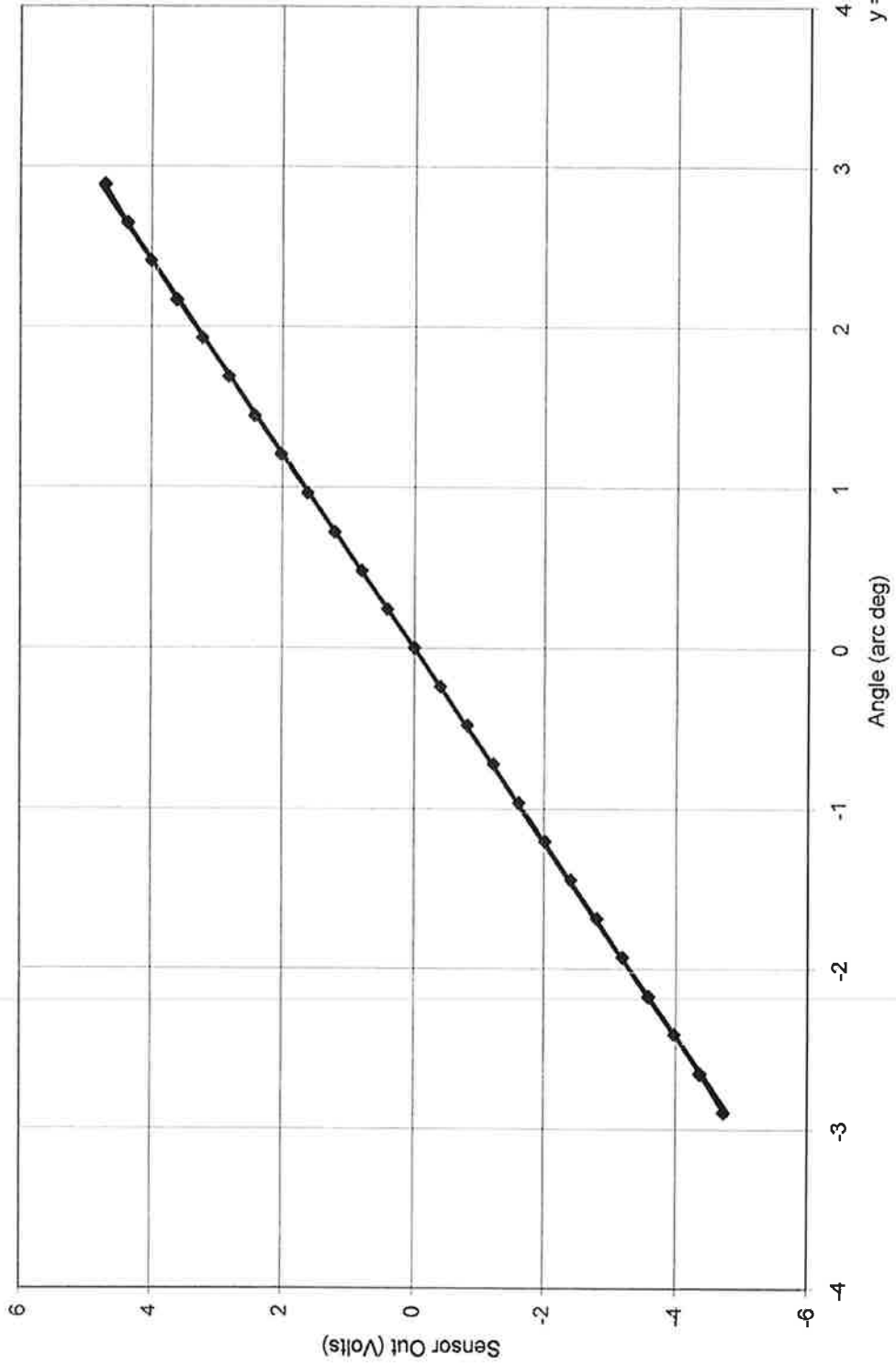
The above coefficients are for a 1st order fit.

Model 801-S/T, Serial No.2747

Calibration Temperature = 22.5

Single-ended Scale Factor = 0.60419 arc degrees/Volt

Series1
Linear (Series1)

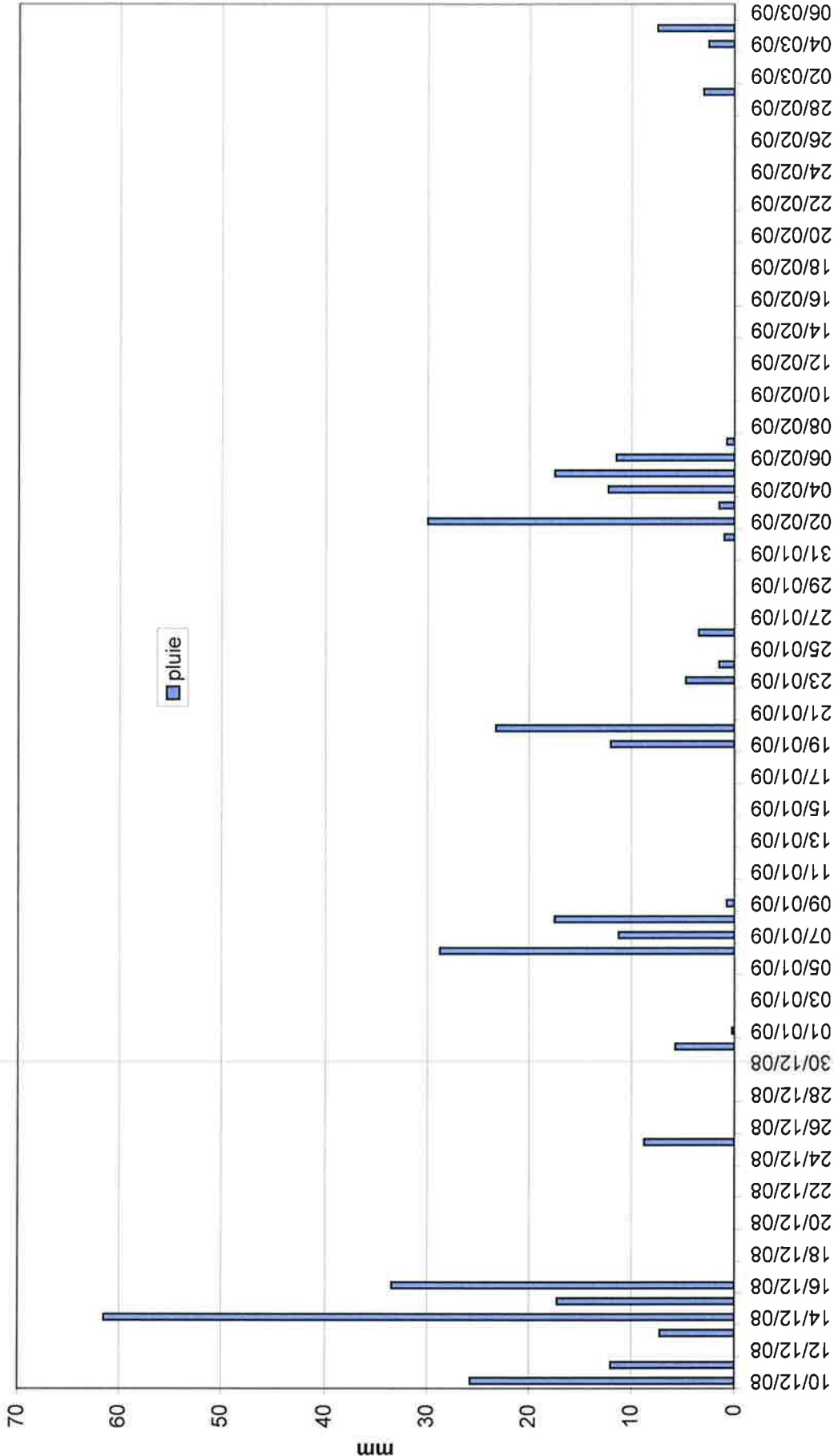


$y = 1.6551x + 0.0078$
 $R^2 = 0.9999$

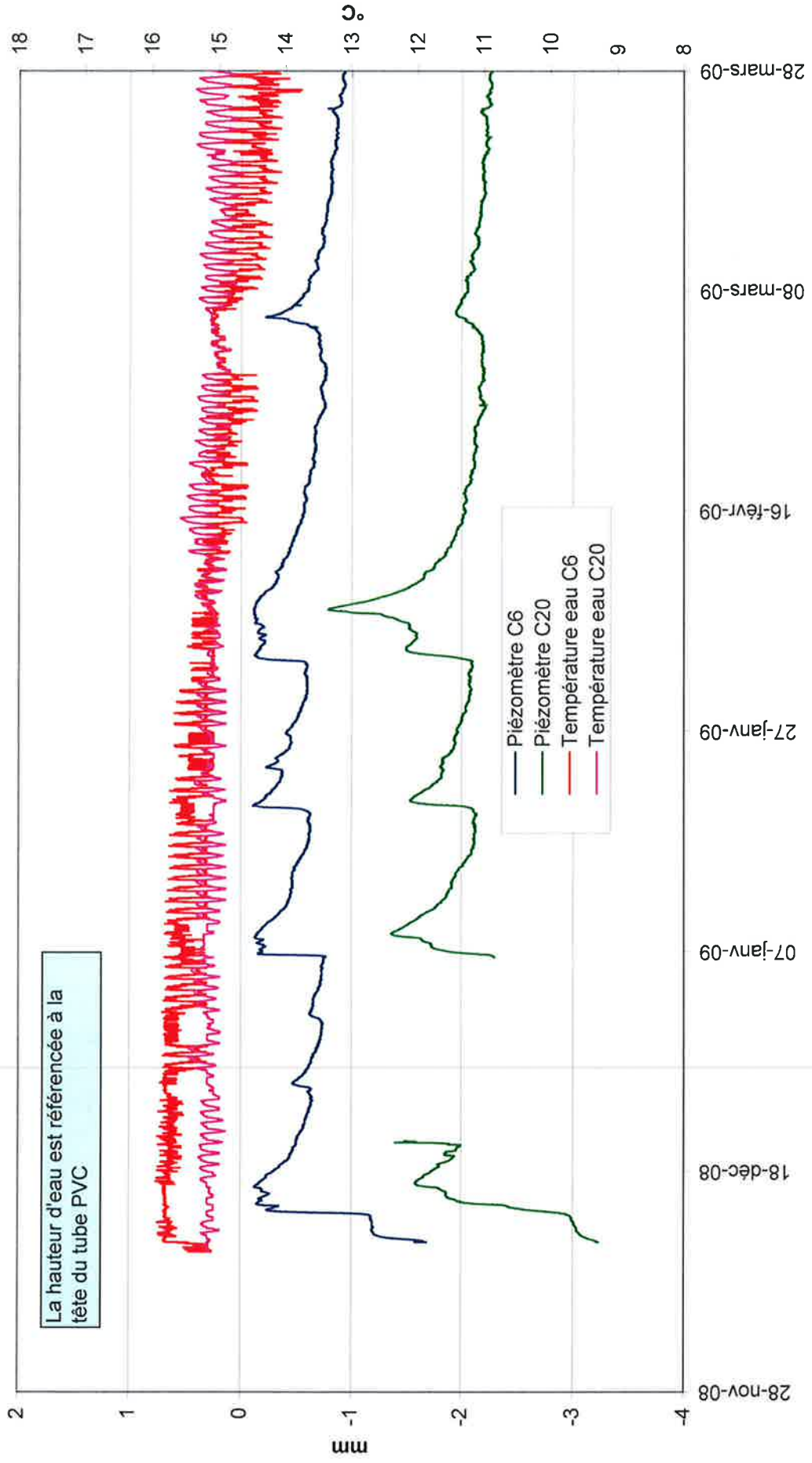
ANNEXE 5

Graphiques

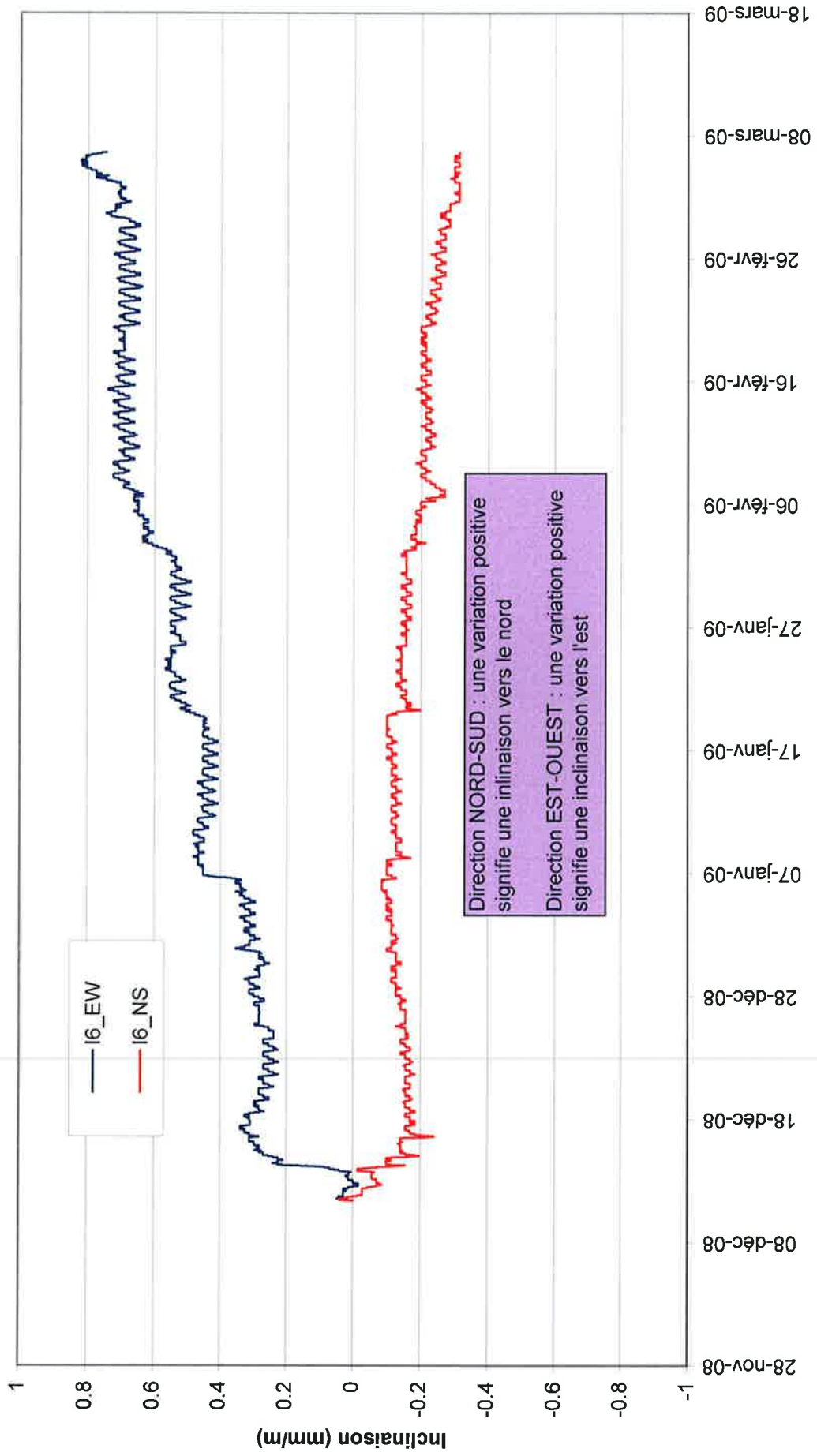
Vence - pluviométrie



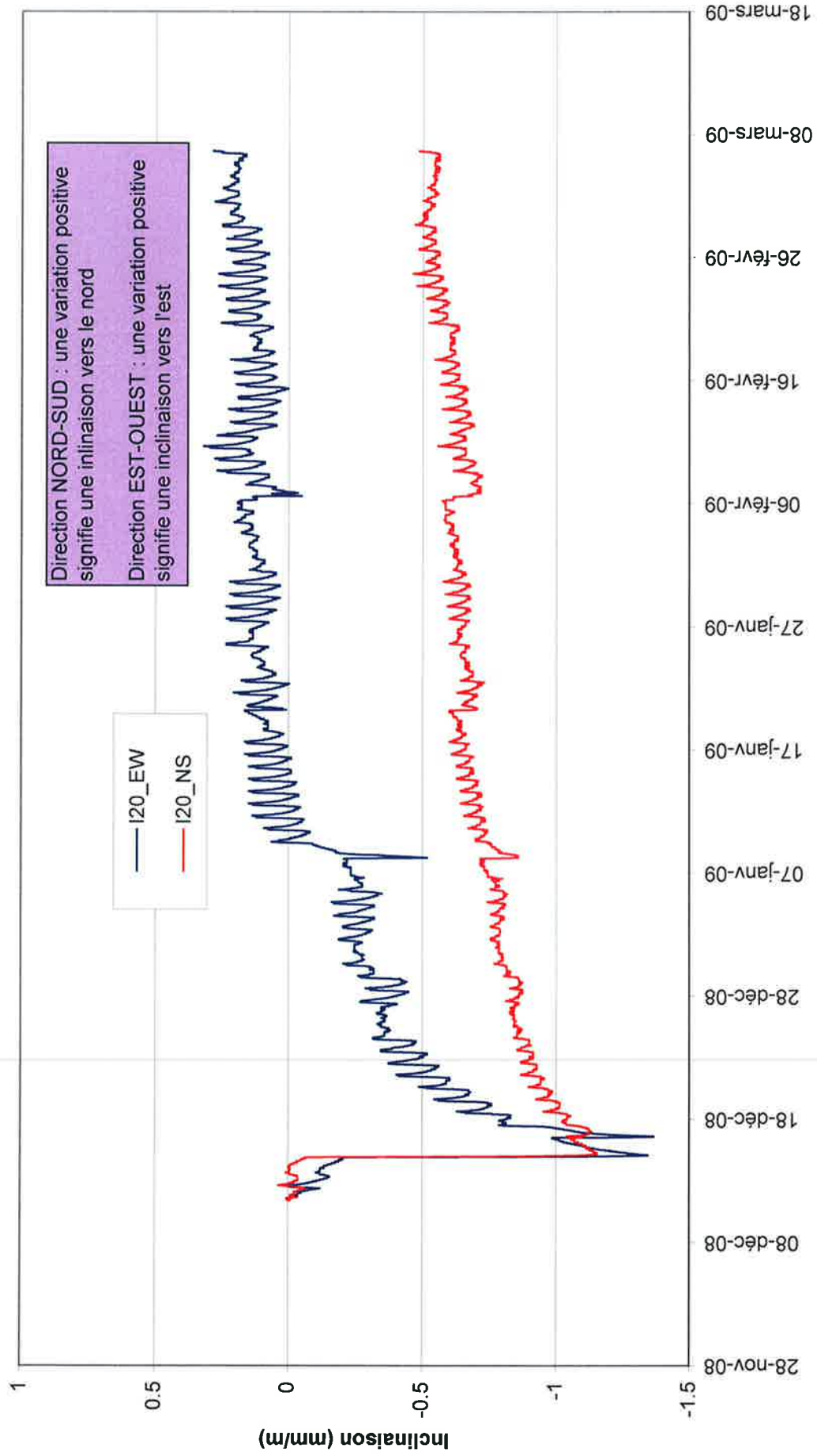
Vence - Prat de Julian - Piézomètres C6 et C20



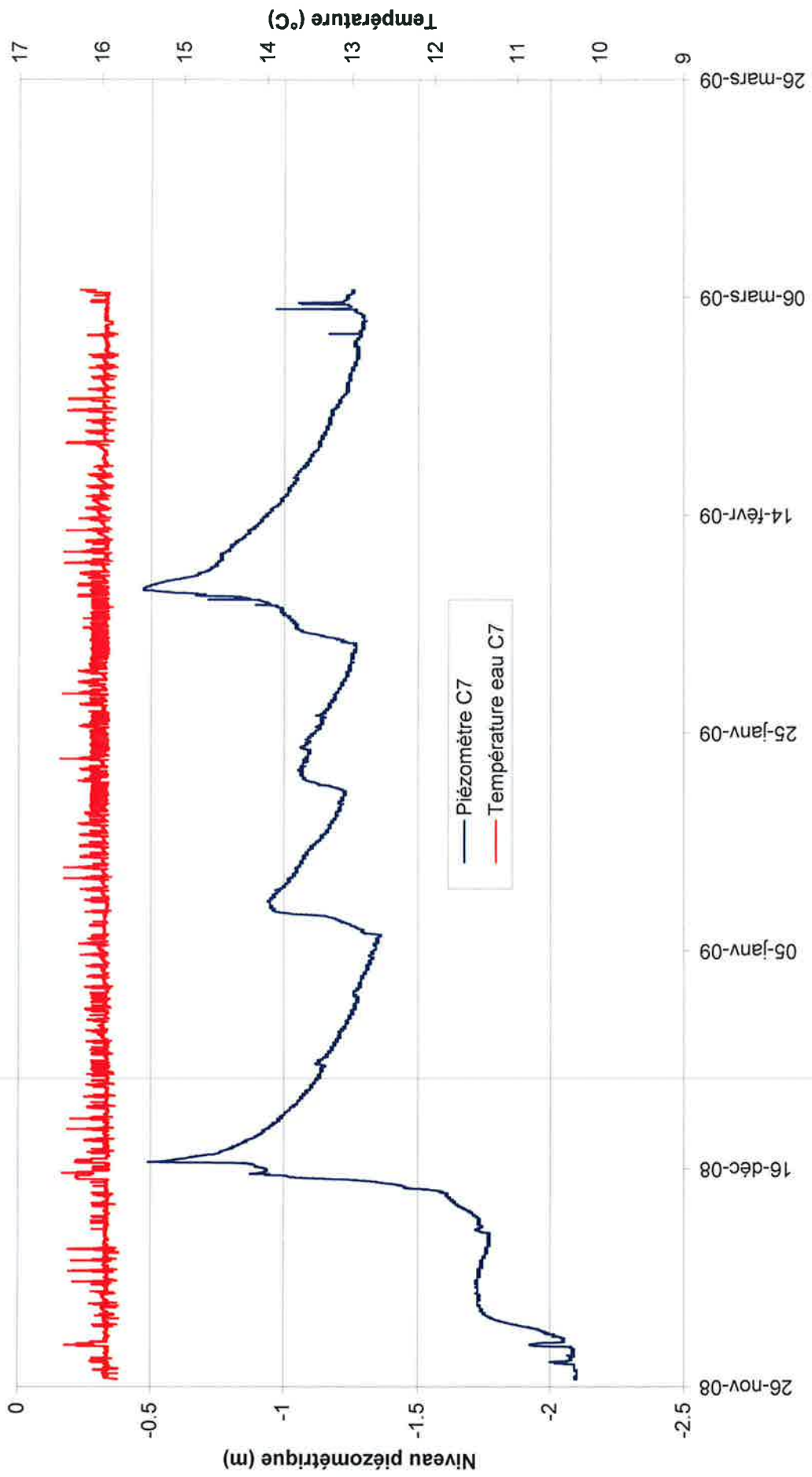
Vence - Prat de Julian - Inclinomètres près de C6



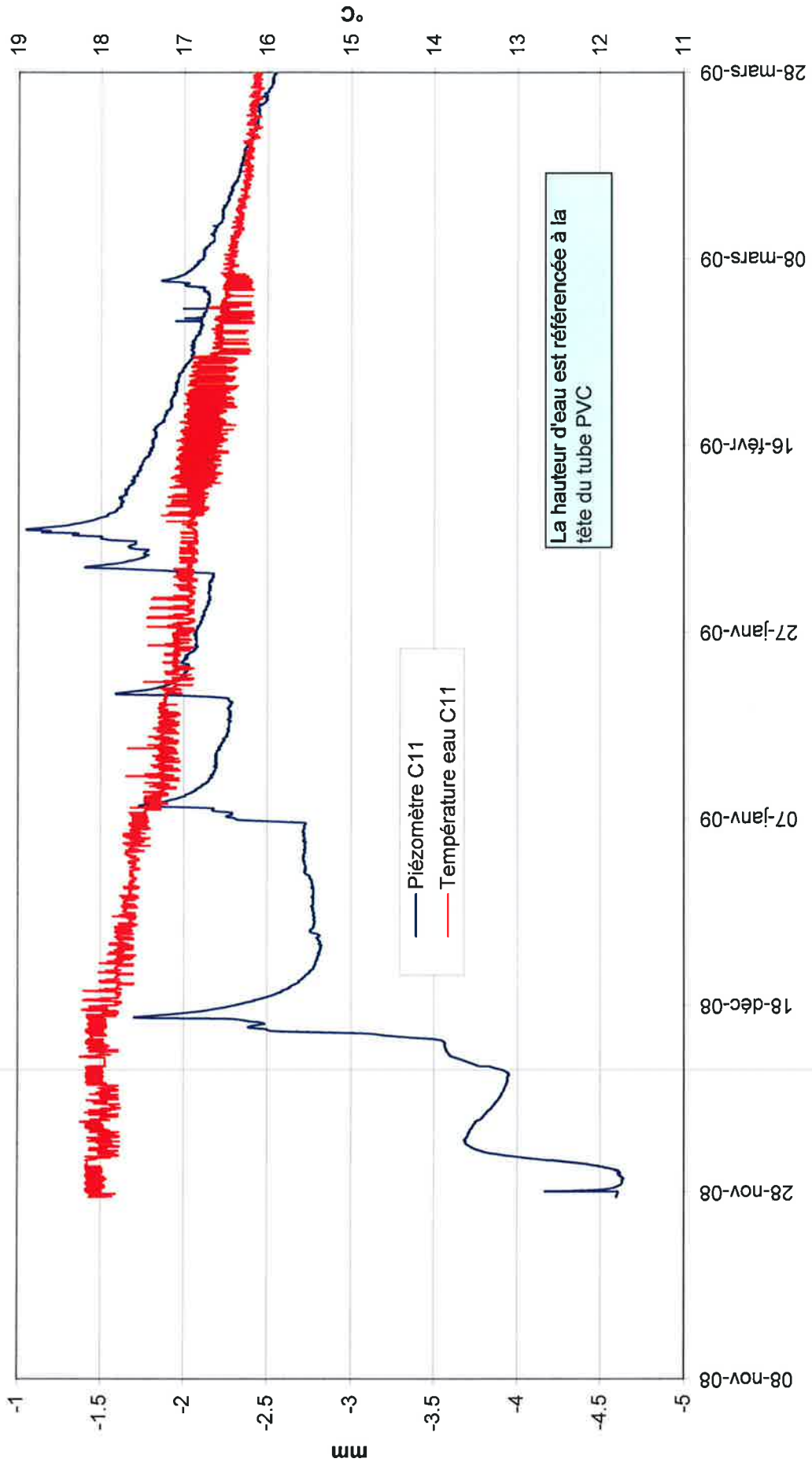
Vence - Prat de Julian - Inclinomètres près de C20



Vence - Prat de Julian - Piézomètre C7



Vence - Prat de Julian - Piézomètre C11



Vence - Prat de Julian - Inclinomètres près de C11

