Camera Temperatures for March 1978 - June 1979

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This paper reports on a project to obtain IUE camera head amplifier temperature (THDA) values for early IUE data. The earliest images were archived with deficient headers in which the binary data, including the camera telemetry snapshots, are unusable. After June 8, 1979, these "camera snaps" became reliable at both Goddard and VILSPA.

Since an accurate THDA for an image is needed for good quality processing, the IUE Observatory undertook an effort to retrieve the available temperature records for this early period. Although some THDAs were recorded on NASA scripts, a more complete source of information was found in the IUE OCC hourly telemetry snapshot records. These records provide camera temperatures for all three functional cameras at hourly intervals.

The laborious task was undertaken to obtain the temperatures from these records. The snapshots are archived as paper copies and on microfiche. The date, UT, and camera temperatures were recorded and entered into a table in the Ingres data base. A file containing this information was delivered to VILSPA.

Figure 1 shows the variation in THDAs for each of the three cameras from the beginning of the recorded values (March 1, 1978) to the date at which the binary headers became reliable (June 8, 1979). Large variations are seen early in 1978, when camera usage was somewhat sporadic and operations were frequently interrupted by computer crashes. One can see that the cameras were probably not fully thermally stabilized until late in 1978. It is also evident that the three camera temperatures fluctuate together, as the overall scientific instrument temperature changes.

The NASA CDIVS system was modified to access this table to obtain THDAs for the early images. The system records THDAs for the beginning and end of the exposure and the read of the image. For the early images, it chooses the THDAs which are nearest in time to those events. If there is no available THDA within 4 hours, a question is recorded in the question table.

There are two "gaps" in the available records. One is from 1978 day 238 11:00 UT to 1978 day 276 20:00 UT and the other is from 1979 day 133 01:00 UT to 1979 day 137 16:00 UT. For these intervals, an average THDA was determined for each camera.

For the SWP and LWR cameras, I determined the average THDA for 5 weeks (0.1 year) before each gap and after each gap. The averages for those periods agreed well so a single average THDA was chosen for each camera. They are listed in Table 1.

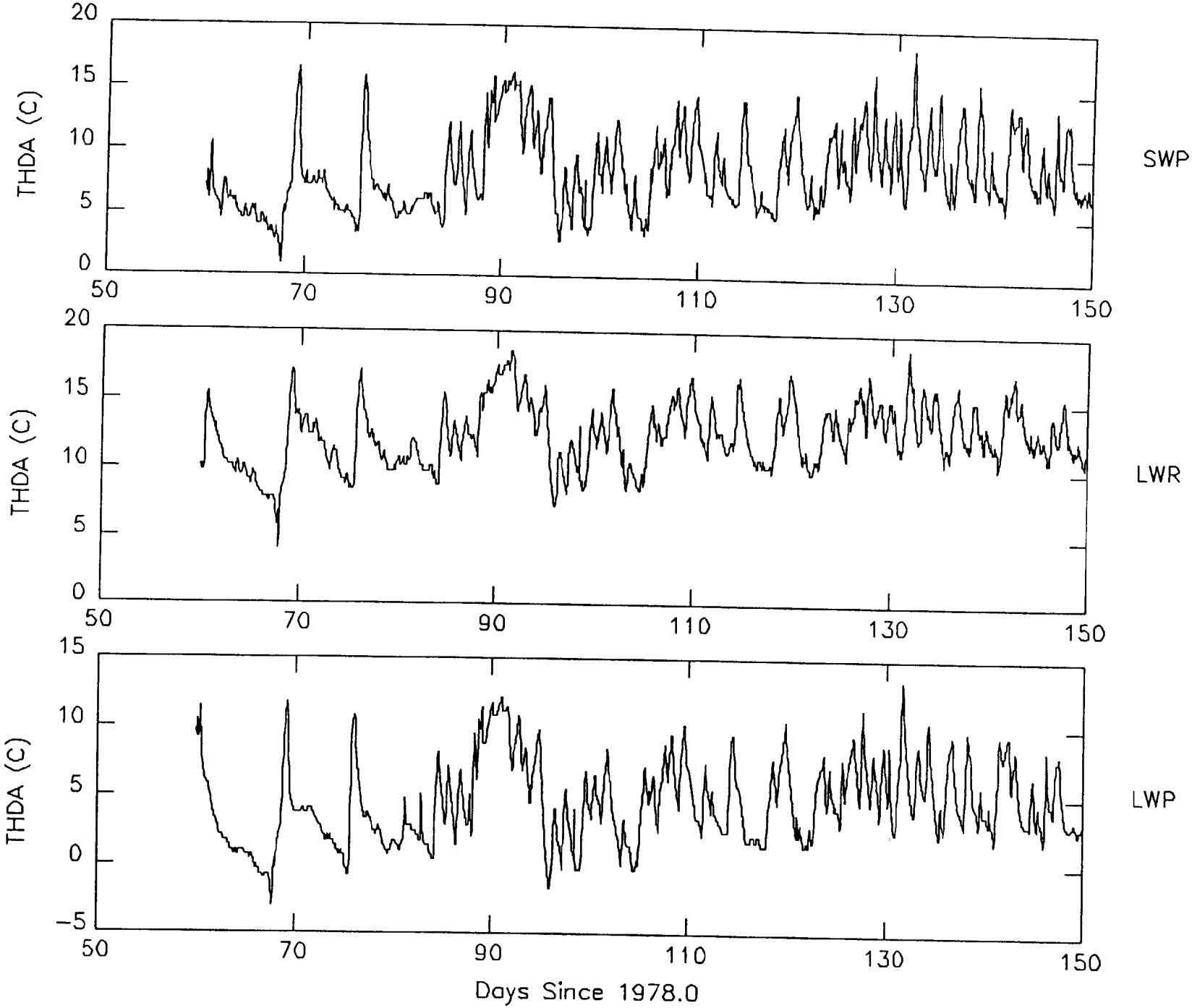
For the LWP, the situation was trickier, since the camera was being turned on and off and frequently went through long periods when it was not used. For the LWP, I computed an average THDA for 1978 days 223 - 228, which was a period of time when the camera was being used fairly heavily. The only LWP observations in the gap are some VILSPA test data on days 238 and 267, according to the log. This average THDA, given in Table 1, should be a reasonable choice for those images.

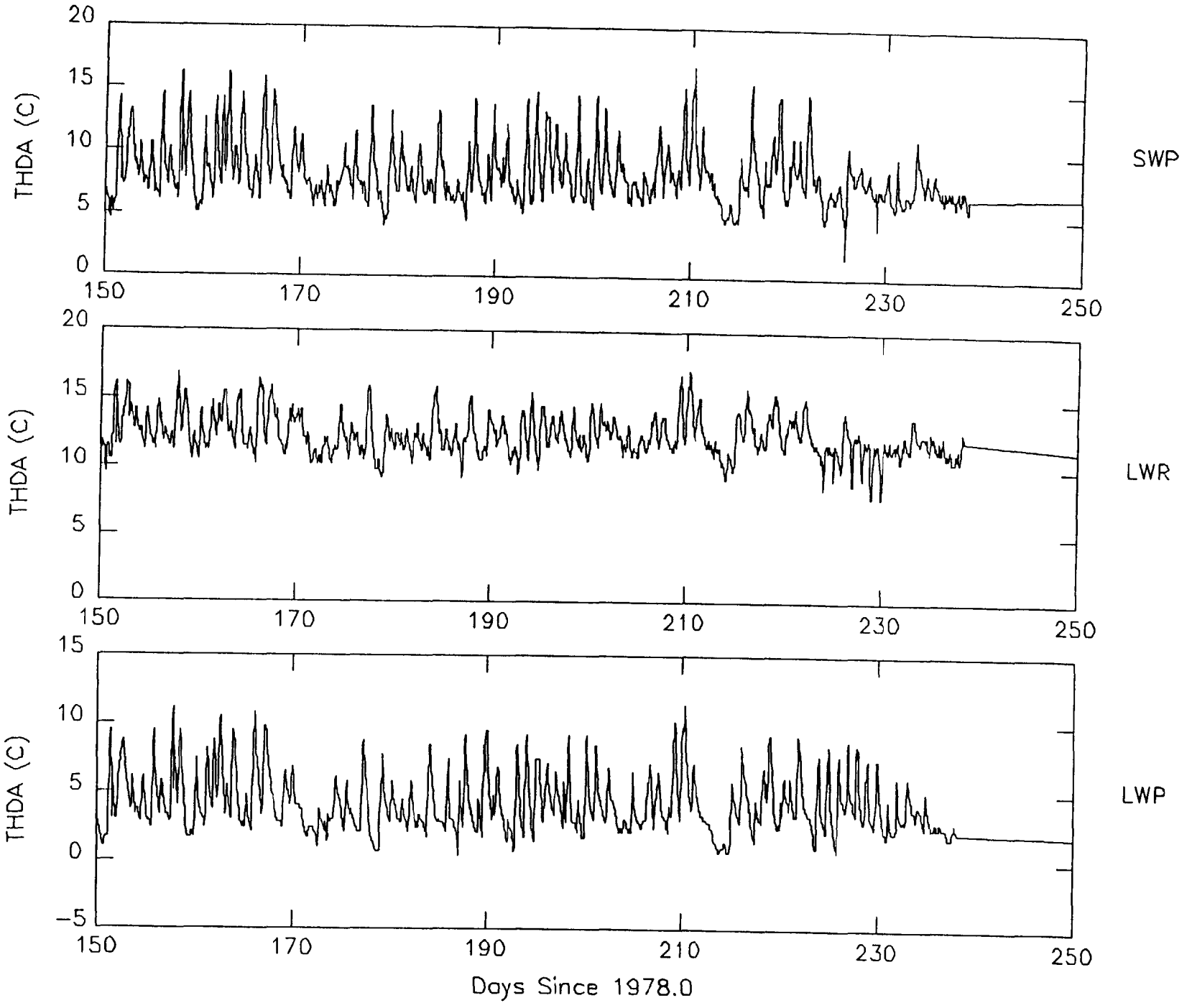
Table 1: Average THDAs for "Gap" Periods

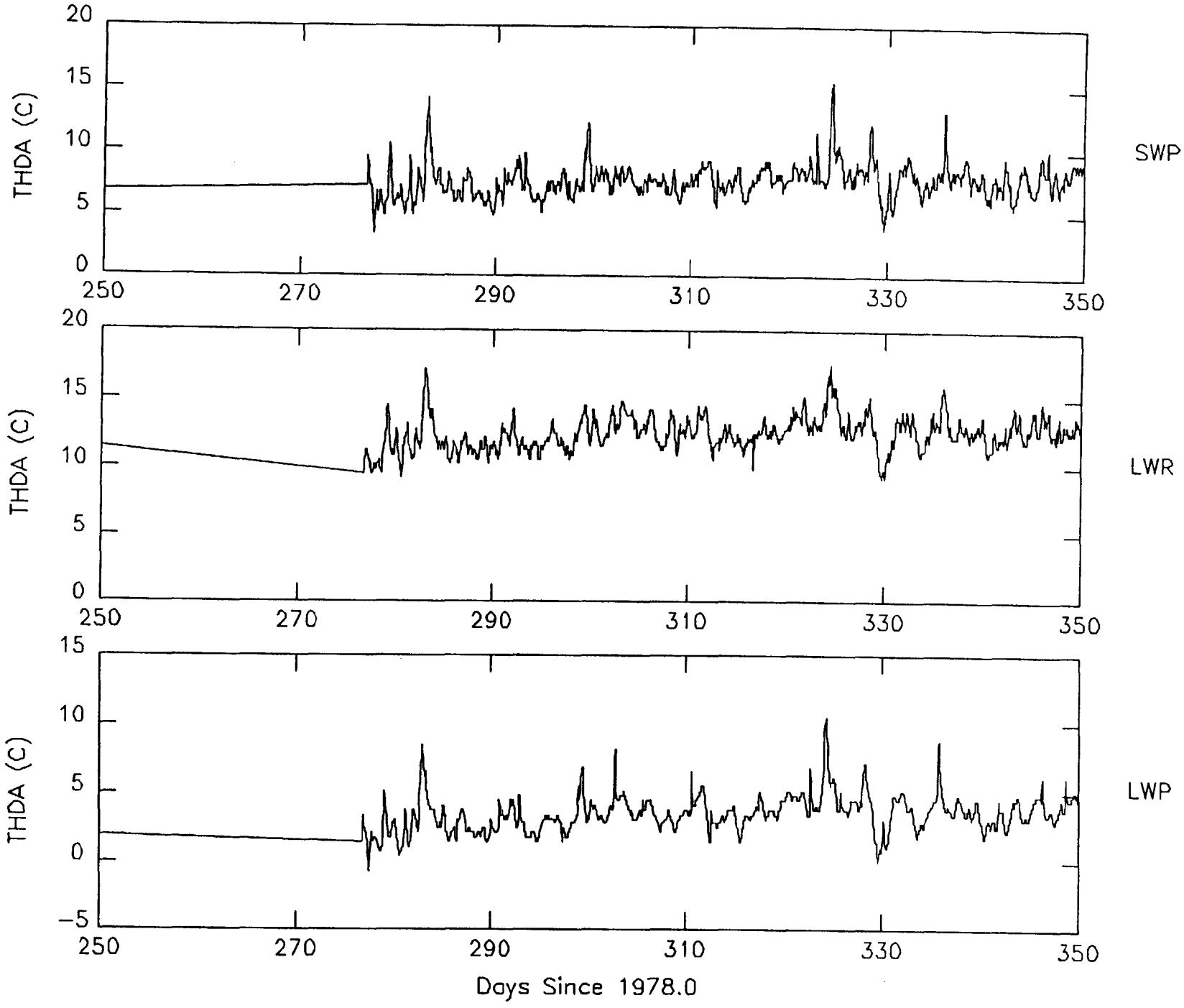
Camera	Average THDA (C)
LWP	4.2
LWR	12.4
SWP	7.9

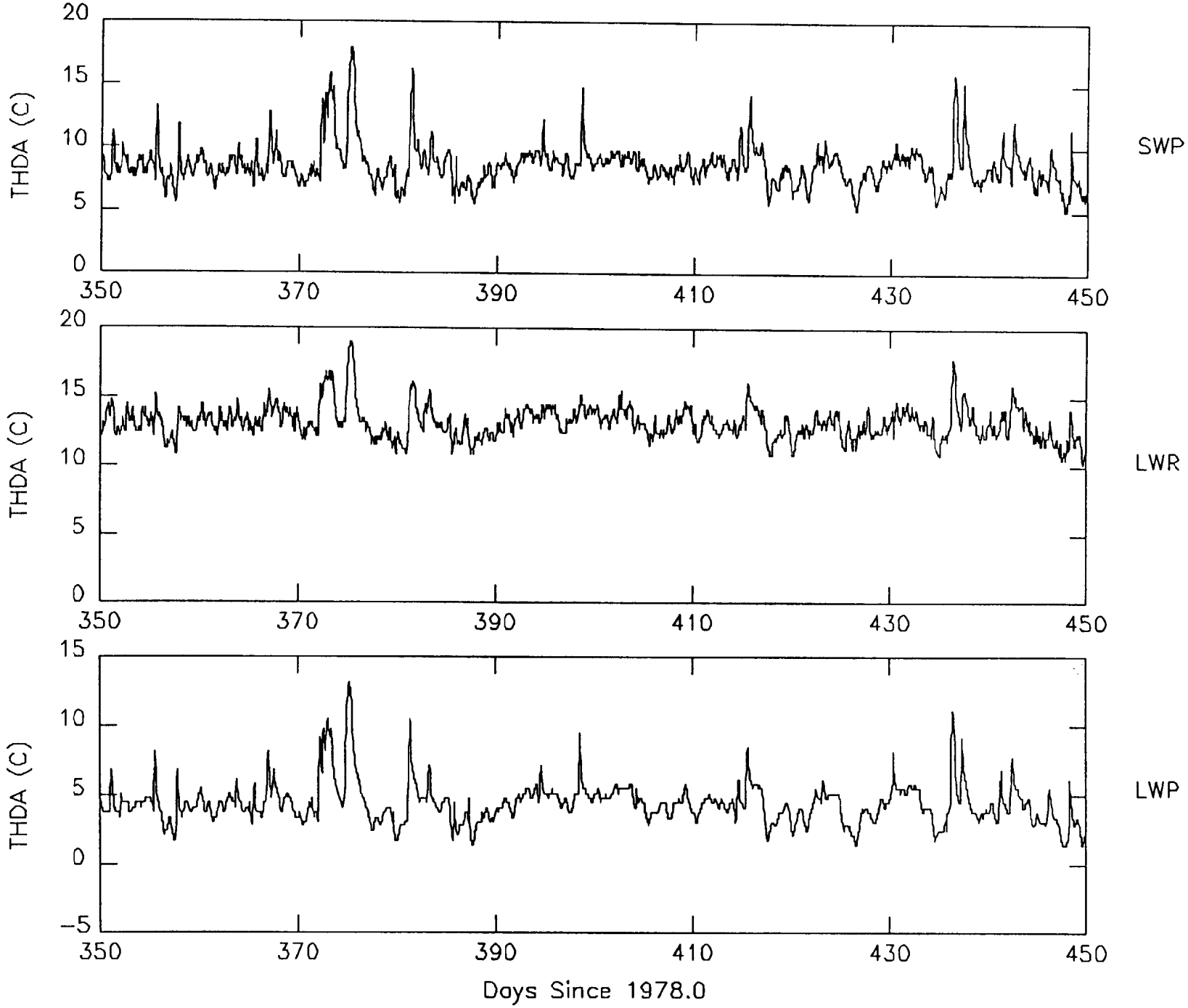
Acknowledgements: I would like to thank the current and past IUE staff members who laboriously compiled this list of THDAs and/or entered them into the data base: Holly Abraham, Robin Curtin, Bill Forcey, Matt Garhart, Velma Greenlee, Peter Summers, Muriel Taylor, Kent Thurston, and Rick Wasatonic. I would also like to thank George Sonneborn, who originally began the project of collecting THDAs from OCC records in 1986. With great foresight, he recognized that this would be an important resource for the IUE Final Archive.

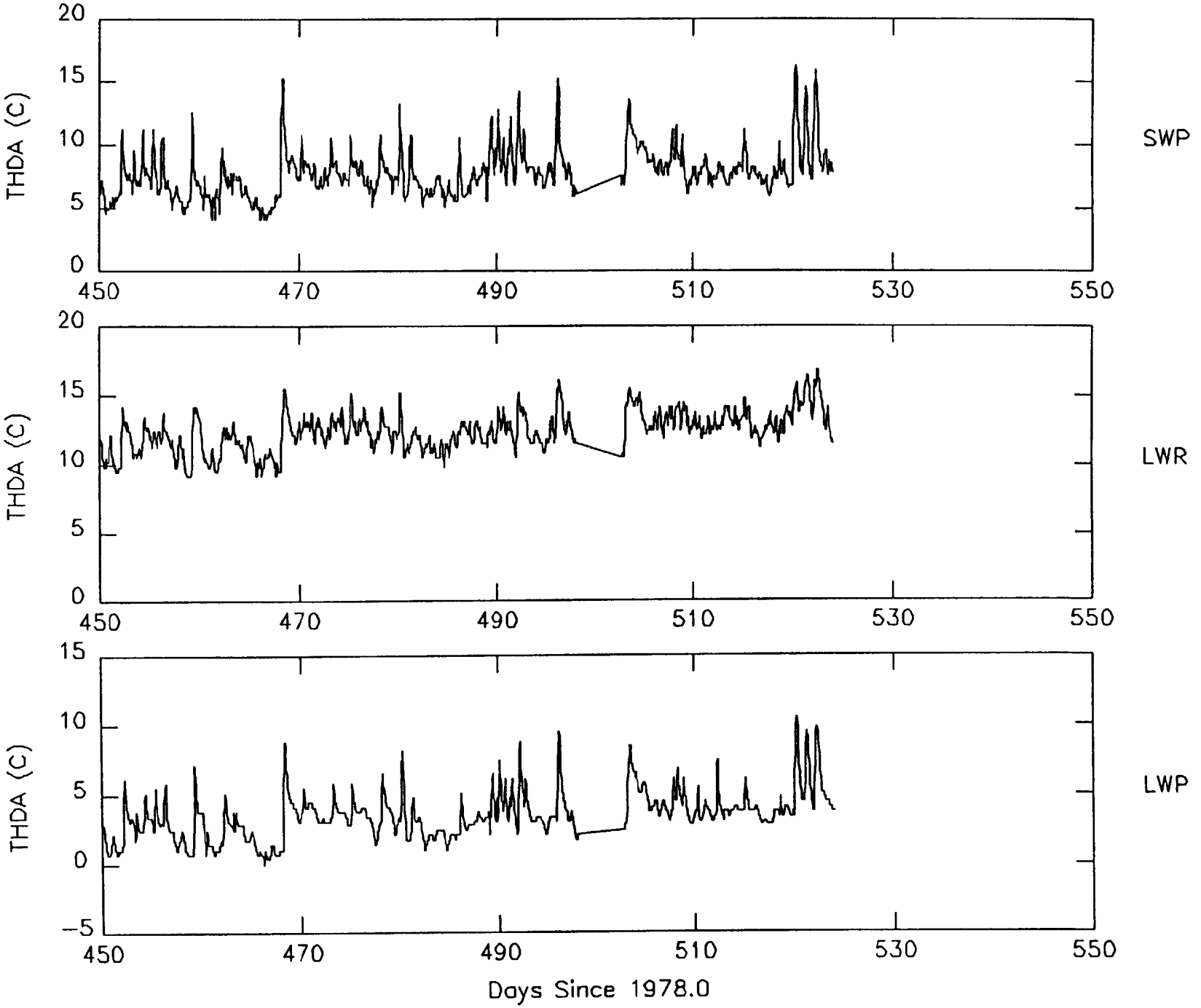
Figure 1: Temperatures for IUE's three operational cameras from March 1, 1978, through June 7, 1979. The camera head amplifier temperature (THDA) is plotted against time in units of days from the beginning of 1978. The plots are shown in sections covering 100 days. The large gap in the data from 1978 day 238 to day 276 is visible as a roughly horizontal straight line. A smaller gap at 1979 day 133 to 137 is also visible.


THDA (C)
20
15
10
5
0
50
70
90
110
130
150
SWP
THDA (C)
LWR
THDA (C)
15
10
5
0
−5
LWP
Days Since 1978.0


THDA (C)
20
15
10
5
0
150
170
190
210
230
250
SWP
THDA (C)
LWR
THDA (C)
15
10
5
0
−5
LWP
Days Since 1978.0


THDA (C)
20
15
10
5
0
250
270
290
310
330
350
SWP
THDA (C)
LWR
THDA (C)
−5
LWP
Days Since 1978.0


20
15
10
5
0
THDA (C)
350
370
390
410
430
450
SWP
20
15
10
5
0
THDA (C)
350
370
390
410
430
450
LWR
15
10
5
0
−5
THDA (C)
350
370
390
410
430
450
LWP
Days Since 1978.0


THDA (C)
20
15
10
5
0
450
470
490
510
530
550
SWP
LWR
LWP
−5
Days Since 1978.0