

CHIVE Data Quality
March 13, 2009

1. Introduction

The Channel Island internal waVe Experiment, CHIVE, was conducted at Landing Cove Anacapa Island from October 29, 2008 till January 8, 2009. It consisted of 9 thermographs mounted on a single mooring, recording temperature every half hour. During the deployment 1694 hours of data were collected. This note describes the data quality.

Three housings were sited along the mooring (top, middle and bottom) with each housing containing 3 thermographs. The thermographs were grouped in threes to provide redundancy as they were used in previous data collections and their battery lives were uncertain. The depths reported on deployment were surface, 25 ft and 52 ft, and on retrieval were 6 ft, 25 ft and 45 ft. The thermographs were also grouped by serial number and denoted by position as in Table 1. The depths were computed as the average of the deployed and retrieved depths and converted to meters.

Table 1. Thermograph positions and locations

Depth/Position	1	2	3
Top, 0.91 m	848471	654546	281360
Middle, 7.62 m	848468	654510	281367
Bottom, 14.78 m	848456	654385	281370

2. Analysis

Data quality was checked by examining the data from each thermograph grouped according to depth, such that all thermographs of a set are subjected to the same water temperatures. The data are plotted for each depth in Figures 1 to 3. The thermographs were set for launch (recording) at 9:00AM PST October 20, 2008, 231 hours before deployment. The figures show that the thermographs of the series 848 and 281 yielded similar measurements and differ by the advertised uncertainties. However, temperature data from the 654 series are significantly less than those measured from the other thermographs. Differences are tabulated in Table 2. An independent measurement made by my SENSUS ULTRA found no thermocline at nearby Pelican Reserve on 12/27/2008 at 2:00pm (hour 1638 after launch). It measured a temperature of 13.1 °C which is consistent with the 13.2 °C average of the 848 series at 2:00pm.

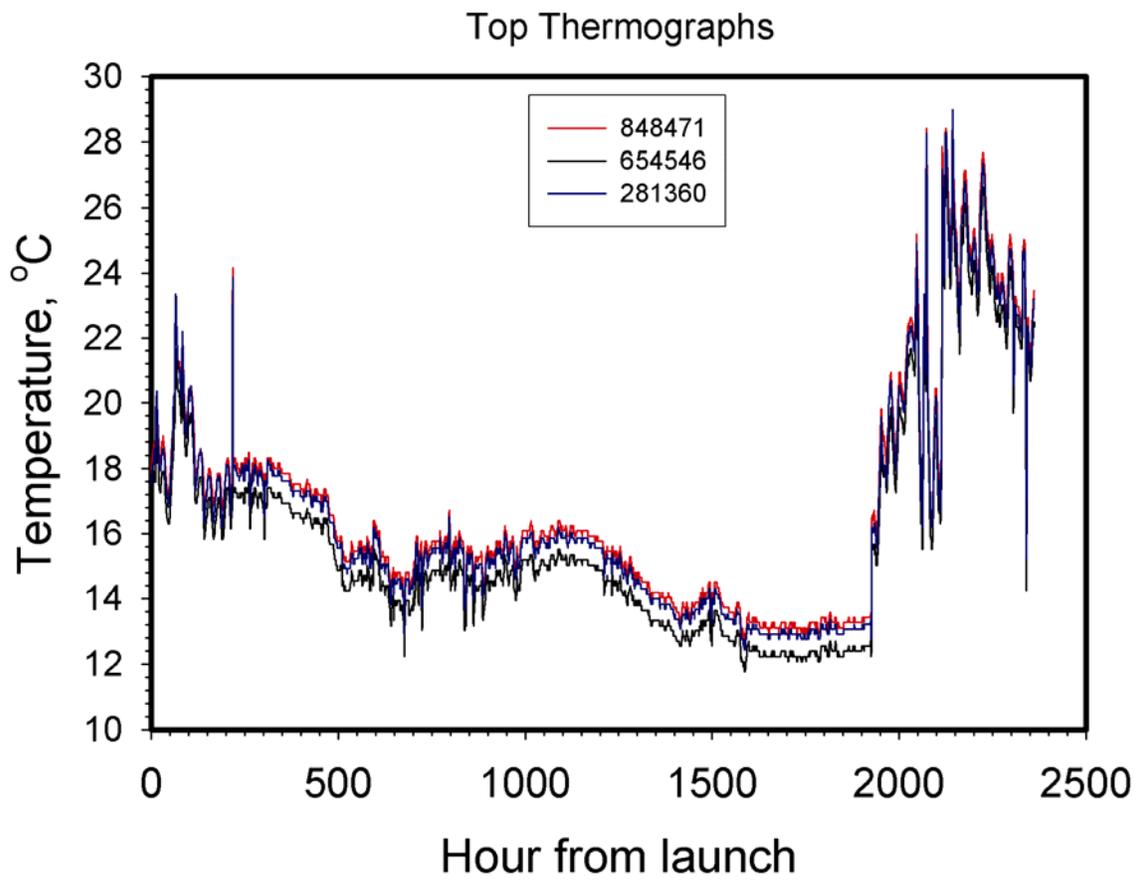


Figure 1. Temperature records from launch to download for thermographs in top housing.

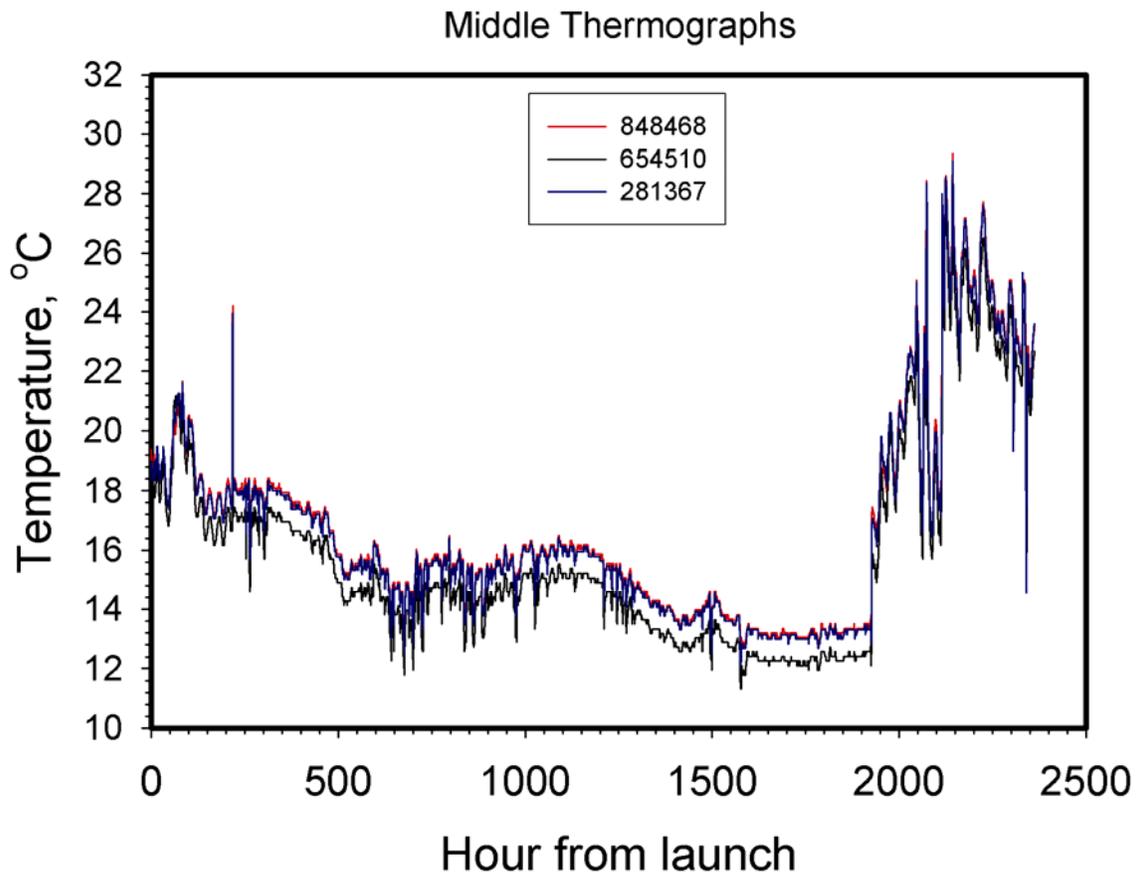


Figure 2. Temperature records from launch to download for thermographs in middle housing.

Bottom Thermographs

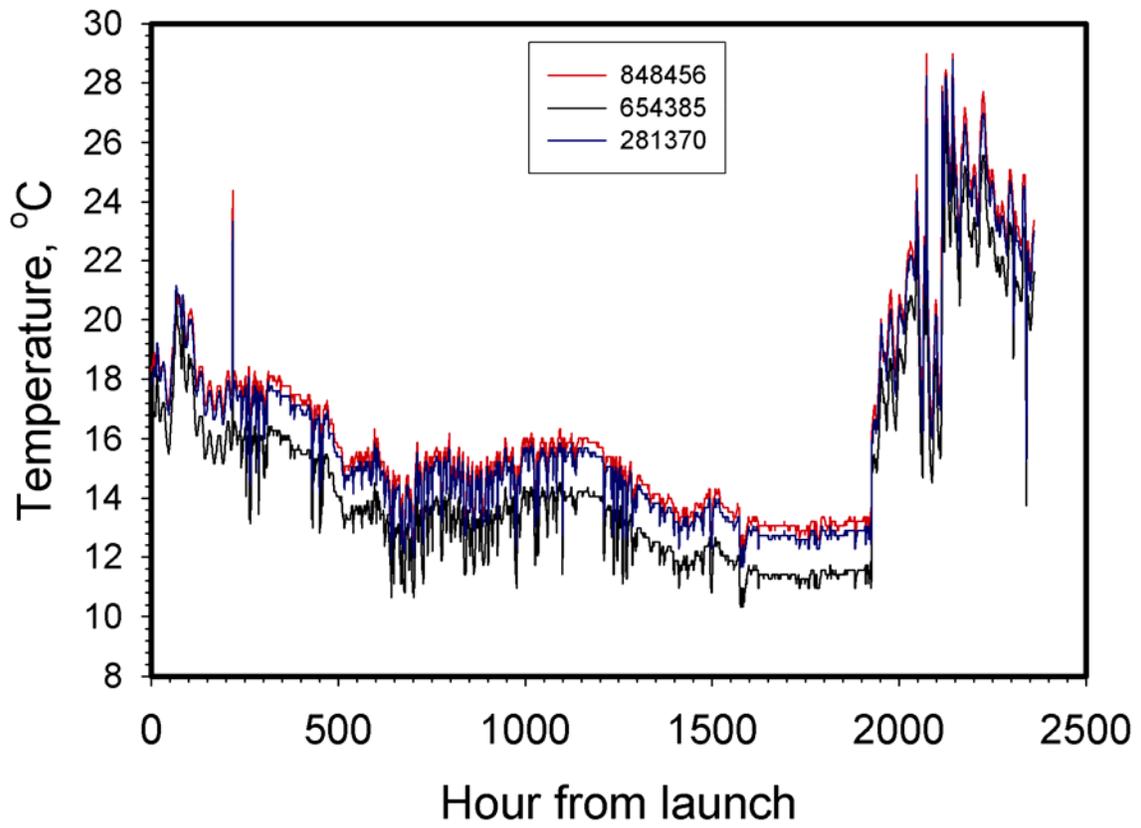


Figure 3. Temperature records from launch to download for thermographs in bottom housing.

Table 2. Average temperature differences among the thermographs, Celsius

	1-2	1-3
Top	0.9 °C	0.2 °C
Middle	0.9 °C	0.1 °C
Bottom	1.7 °C	0.4 °C

Note also the temperature spike at approximately hour 225 after launch seen in Figures 1-3. This time is before the thermographs are deployed. The data surrounding this spike are shown in expanded view in Figure 4 and indicate that the thermographs are temporally calibrated among themselves.

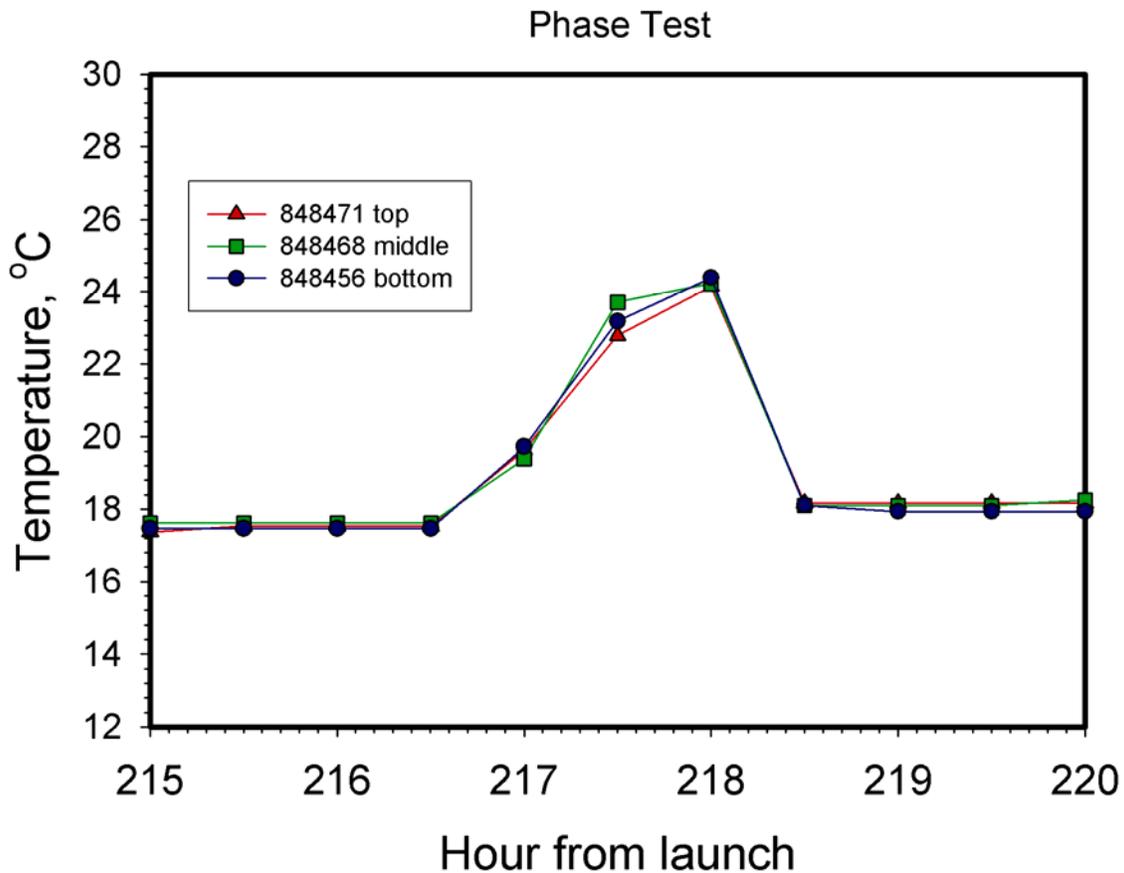


Figure 4. Expanded view of temperature spike.

3. Summary

I recommend using only the 858, or equivalently, the 281 series thermograph data for analysis. These thermographs are consistent in measurements and agree with an independent sample. All thermographs registered the temperature spike at the same time.