

Argos 3 SVBPG Power Usage and Projected Battery Life

Alkaline Battery Characteristics and Properties for Projecting Life

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Alkaline Battery Chemistry

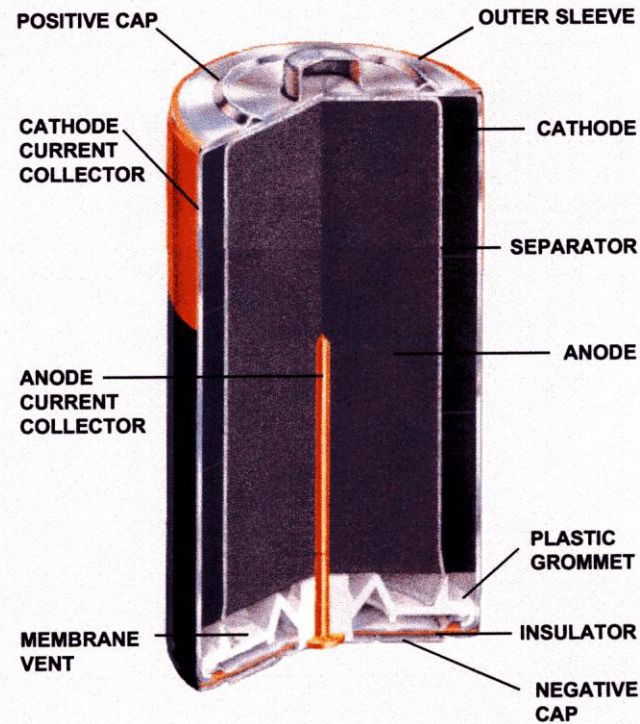
- Rate capability
 - energy density
 - service maintenance, or life
 - Low temperature performance
-

Chemical Characteristics Promoting Desirable Qualities

- ❑ High purity, high density cathode: conductive carbon matrix
 - ❑ High purity, high surface area zinc anode
 - ❑ Highly conductive, low freezing point electrolyte solution
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Alkaline – Manganese Cell

Figure 1

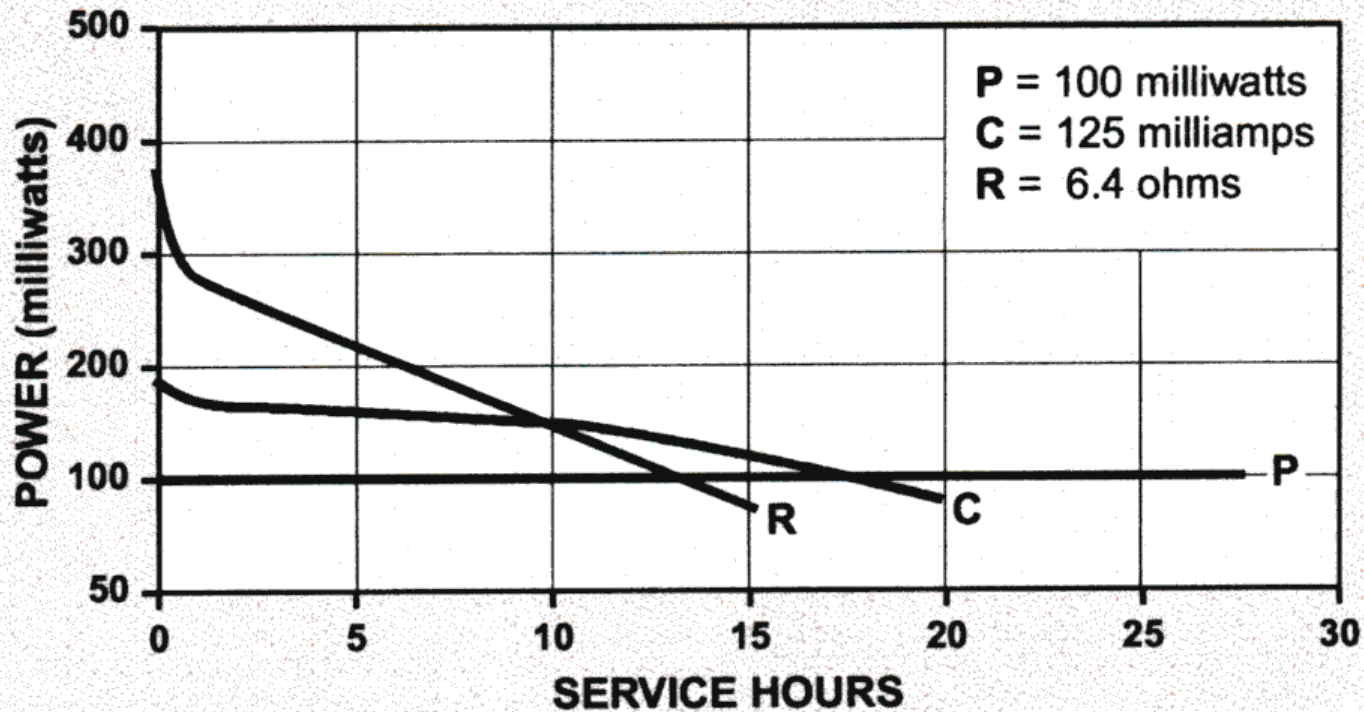


DURACELL® cylindrical alkaline cell.

SVP Electronics Operation

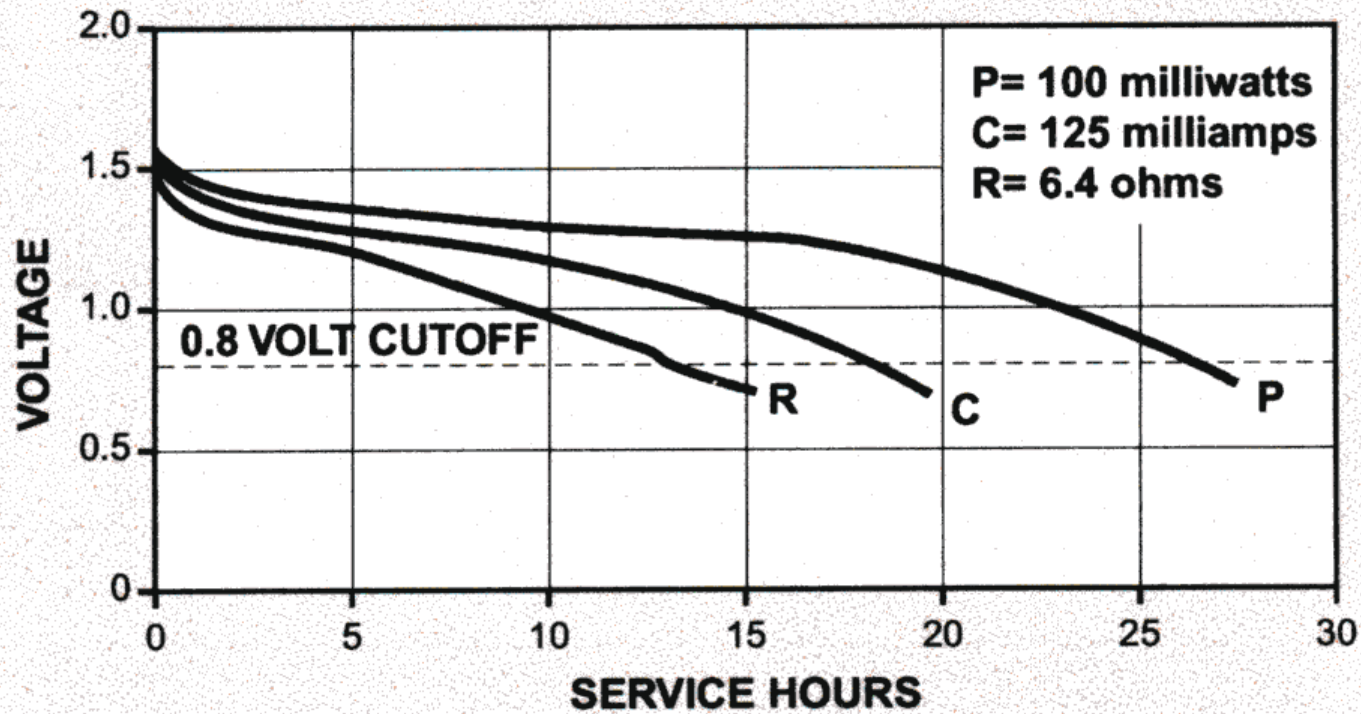
- ❑ Operates as constant power device
 - ❑ Subsystems are supplied regulated, constant voltages
 - ❑ Processor @ 3.5 VDC
 - ❑ Transmitter @ 6 VDC
 - ❑ Constant power operation is most efficient for alkaline battery
 - ❑ Life is mostly determined by XMTR power needs and duty cycle:
 - 400 mA @ VDC
 - 1/90 s
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Power Profile – Constant (P)



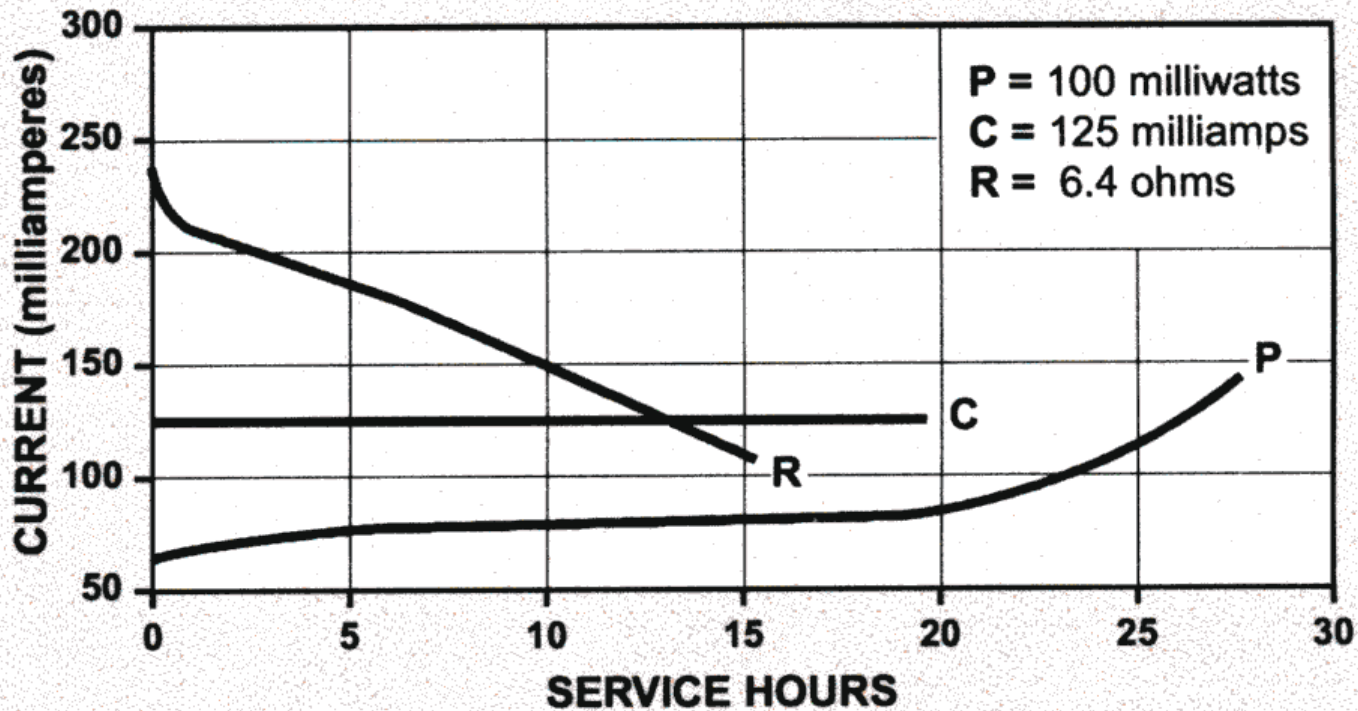
Power profile under different modes of discharge

Voltage Profile (See P)



Voltage profile under different modes of discharge

Current Profile (See P)



Current profile under different modes of discharge

Effect of Storage Temperature on Service Maintenance

- ❑ Storage below 21 C (70 F) will somewhat increase service maintenance
 - ❑ Storage above 21 C (70 F) will significantly reduce service maintenance
 - ❑ Temperature affects the battery's internal resistance: it increases with decreasing temperature
 - ❑ Internal resistance increases with service: more of the voltage is consumed internally as the internal resistance of the battery grows in relation to the working load
-

Standard Service Tests

Industry Standard Tests @ 20° C

PORTABLE LIGHTING
1.5 ohm - HIF



TOY
2.2 ohm - 1hr/day



PORTABLE STEREO
600 mA - 2 hr/day



PORTABLE LIGHTING
2.2 ohm - LIF



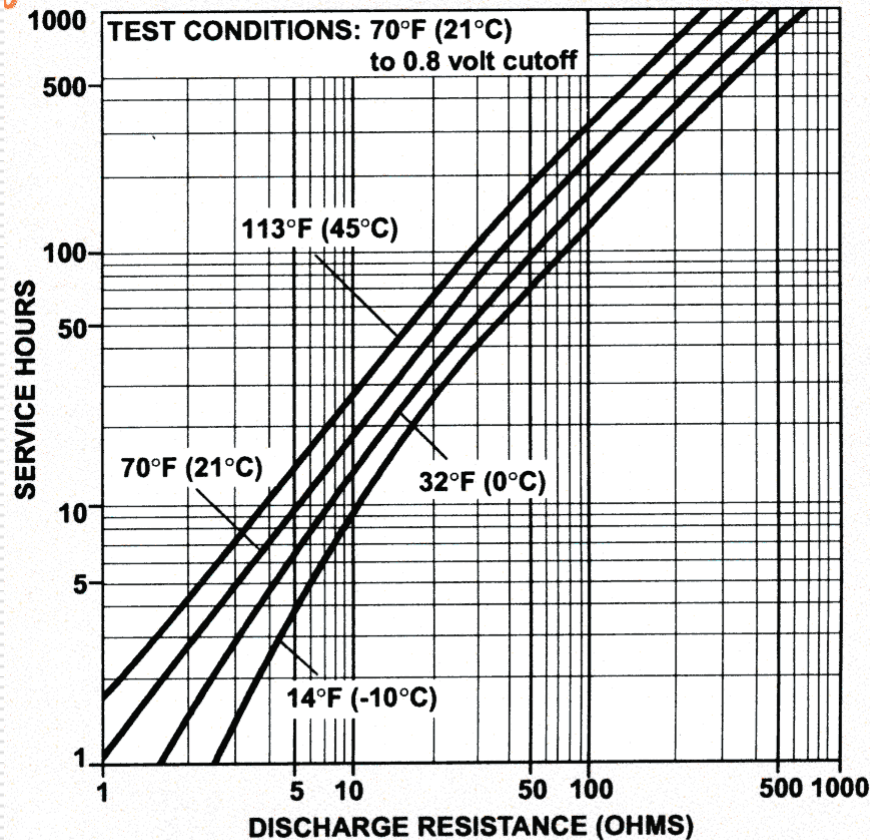
RADIO
10 ohm - 4 hr/day



Shelf Life - Loss per Year

- 20 C: 3.5% per year
 - 35 C: 7 % per year
-

Temperature Effects

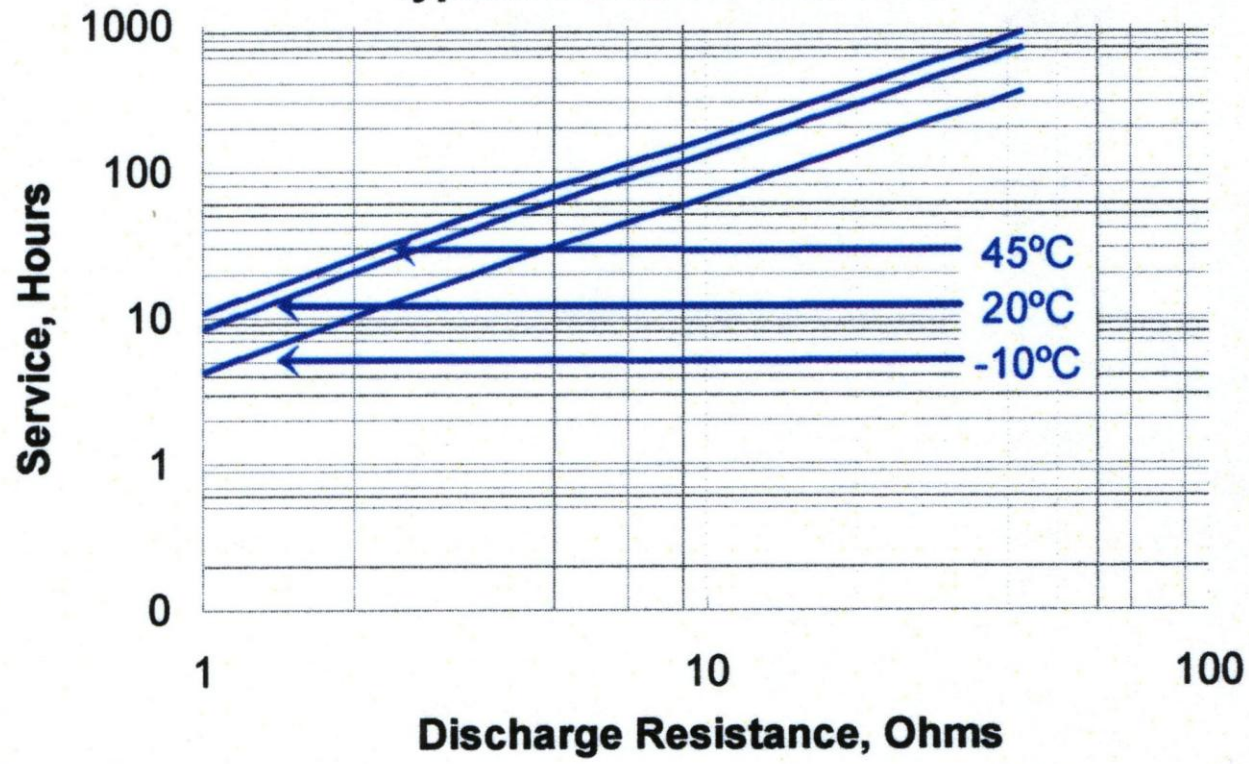


Effect of temperature and load on the performance of the DURACELL® alkaline MN1500 ("AA" size) cell.

Standard Service Tests

- Portable lighting, 1.5 Ohm
 - Half-life of 8.5 hours at 1.08 VDC
 - Toy, 2.2 Ohm, 1 hr/day
 - Half-life of 13.5 hours at 1.1 VDC
 - Portable Stereo, 600 mA at 2 hr/d
 - Half-life of 10.5 hours at 1.1 VDC
 - Portable lighting, 2.2 Ohm
 - Half-life of 28 hours at 1.08 VDC
 - Radio, 10 Ohm 4 hr/d
 - Half-life of 70 hours at 1.26 VDC
-

TEMPERATURE EFFECTS Typical Service to 0.8 Volts



Determining Amount of Service Life

- ❑ Open circuit test: a rough estimate
 - ❑ Close circuit test, or testing under load
 - ❑ 1.1 volts means approximately 20% service remains
-

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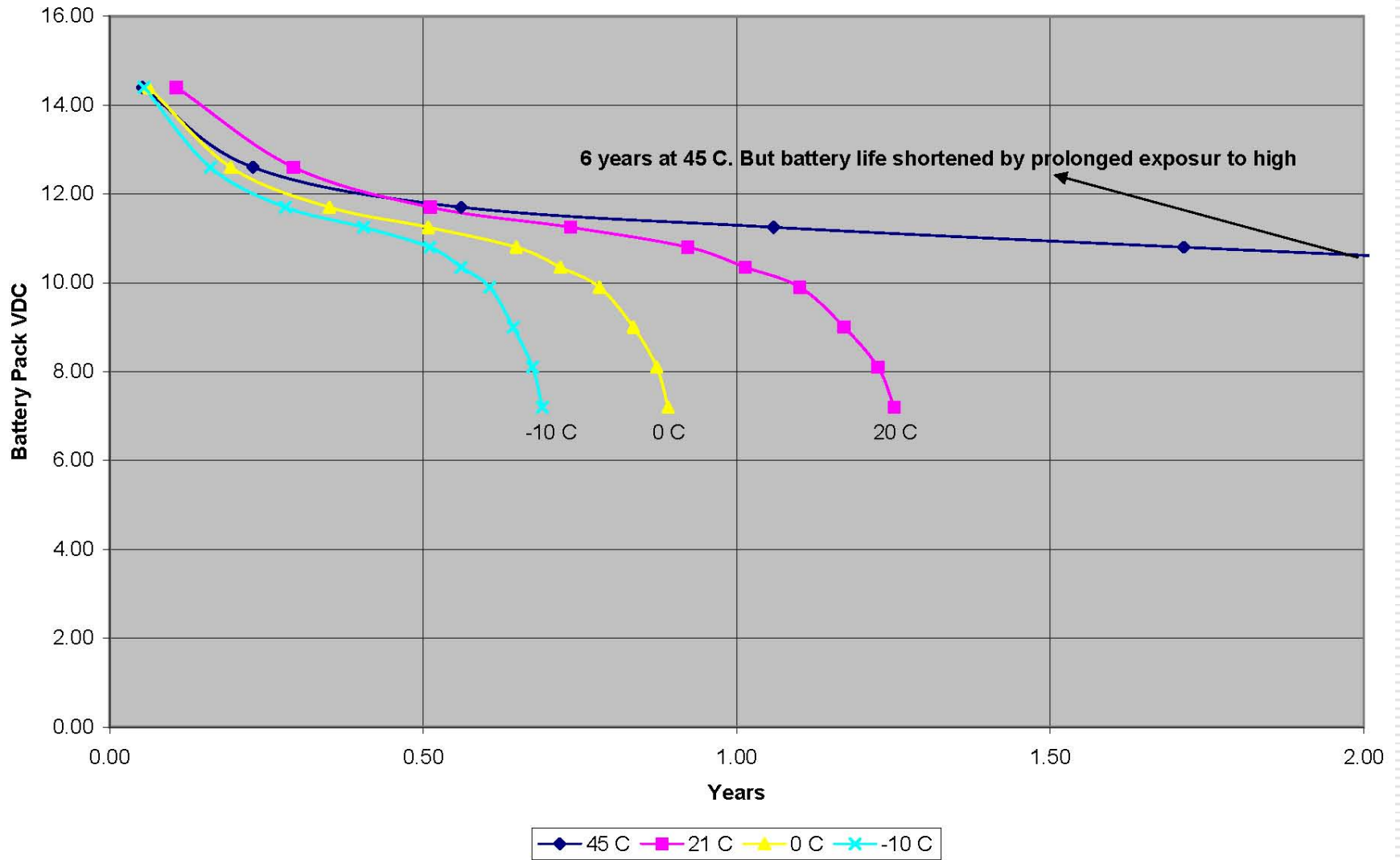
Battery Care

7.1 Storage Conditions

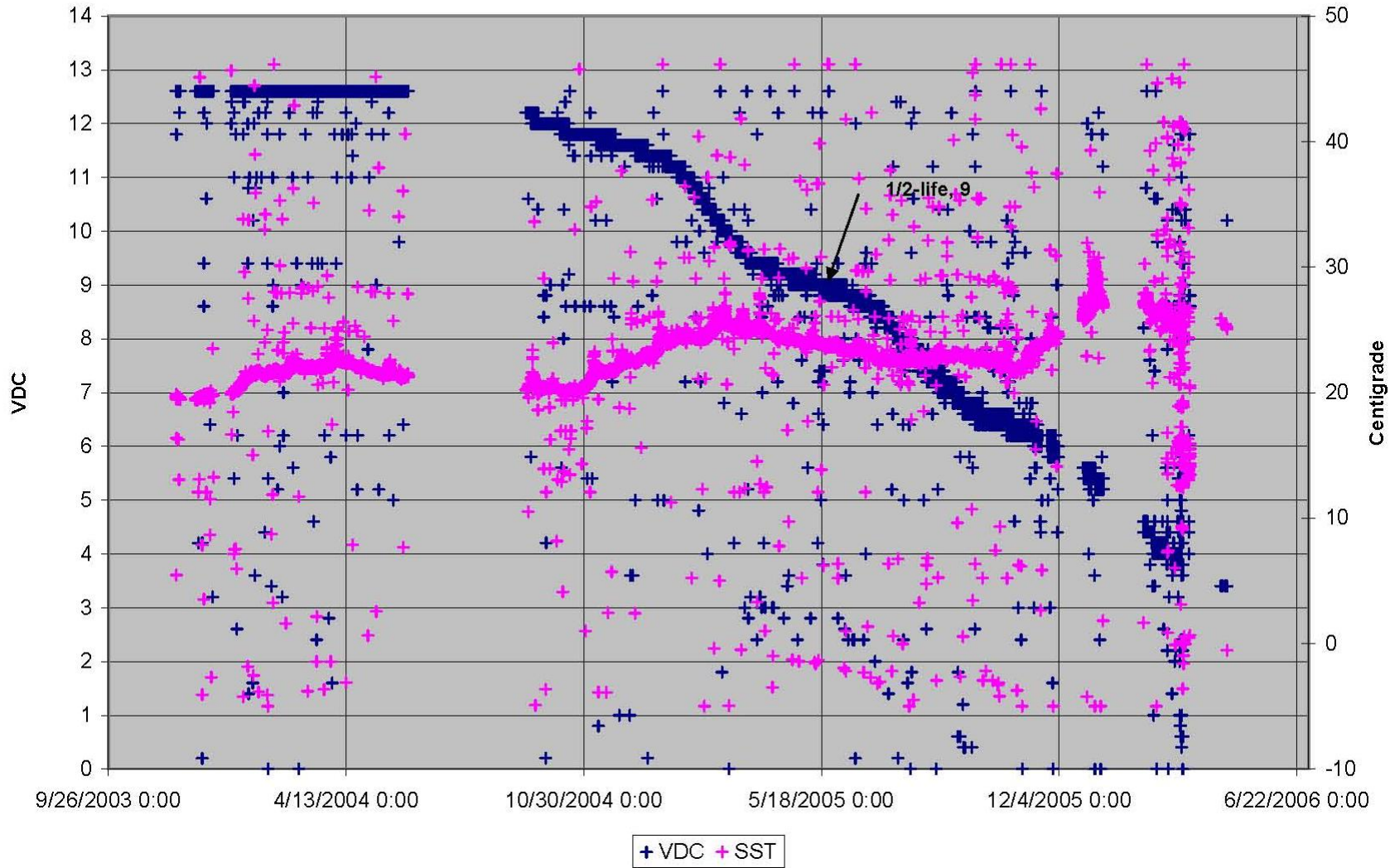
Batteries should be stored at temperatures between 50°F (10°C) and 77°F (25°C), with relative humidity not exceeding 65 percent. Refrigeration of alkaline batteries is not necessary because of their very

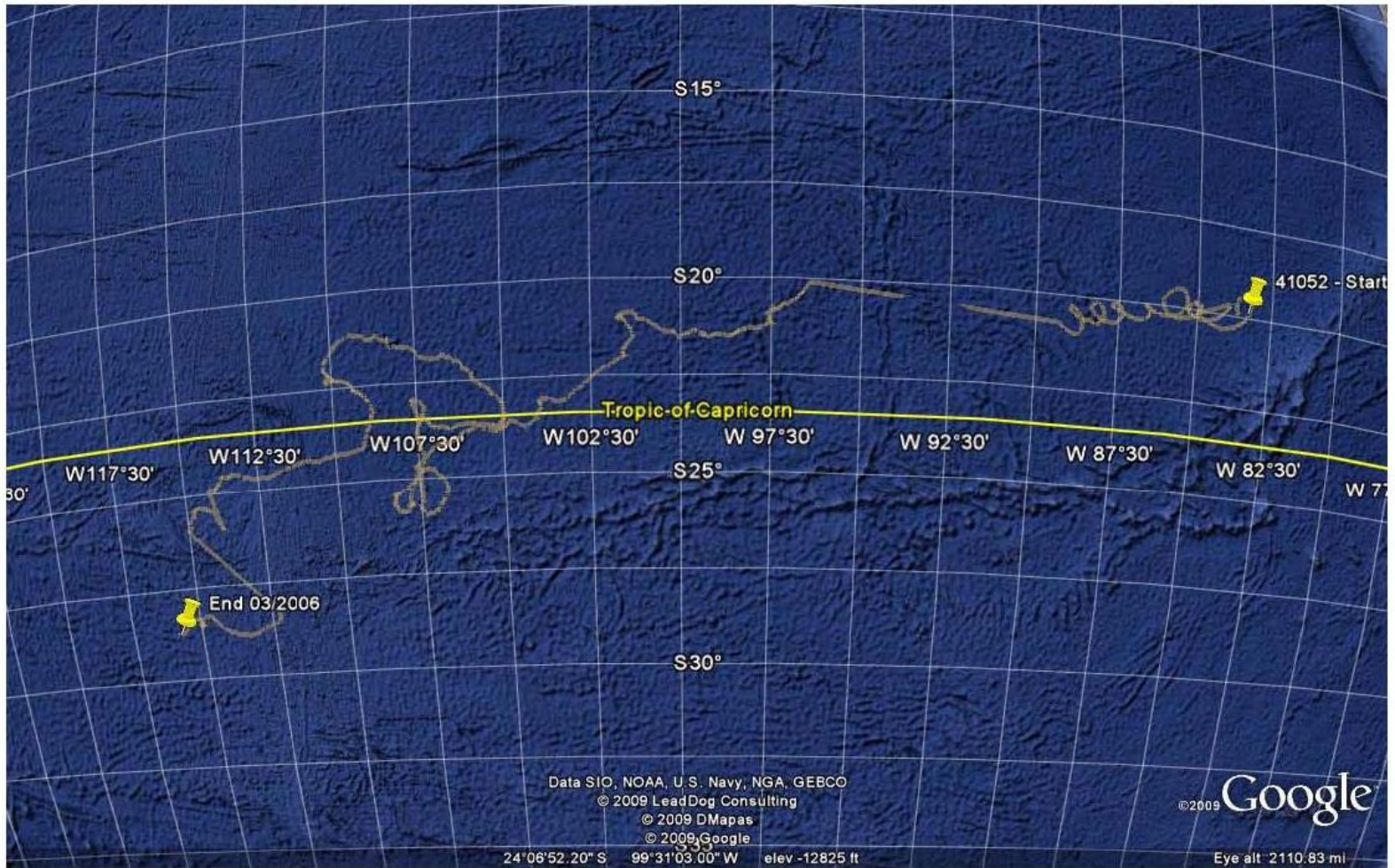
good capacity retention. Excessive temperature cycling and storage at temperatures greater than 77°F (25°C) should be avoided to maximize shelf life.

Projected SVP Life

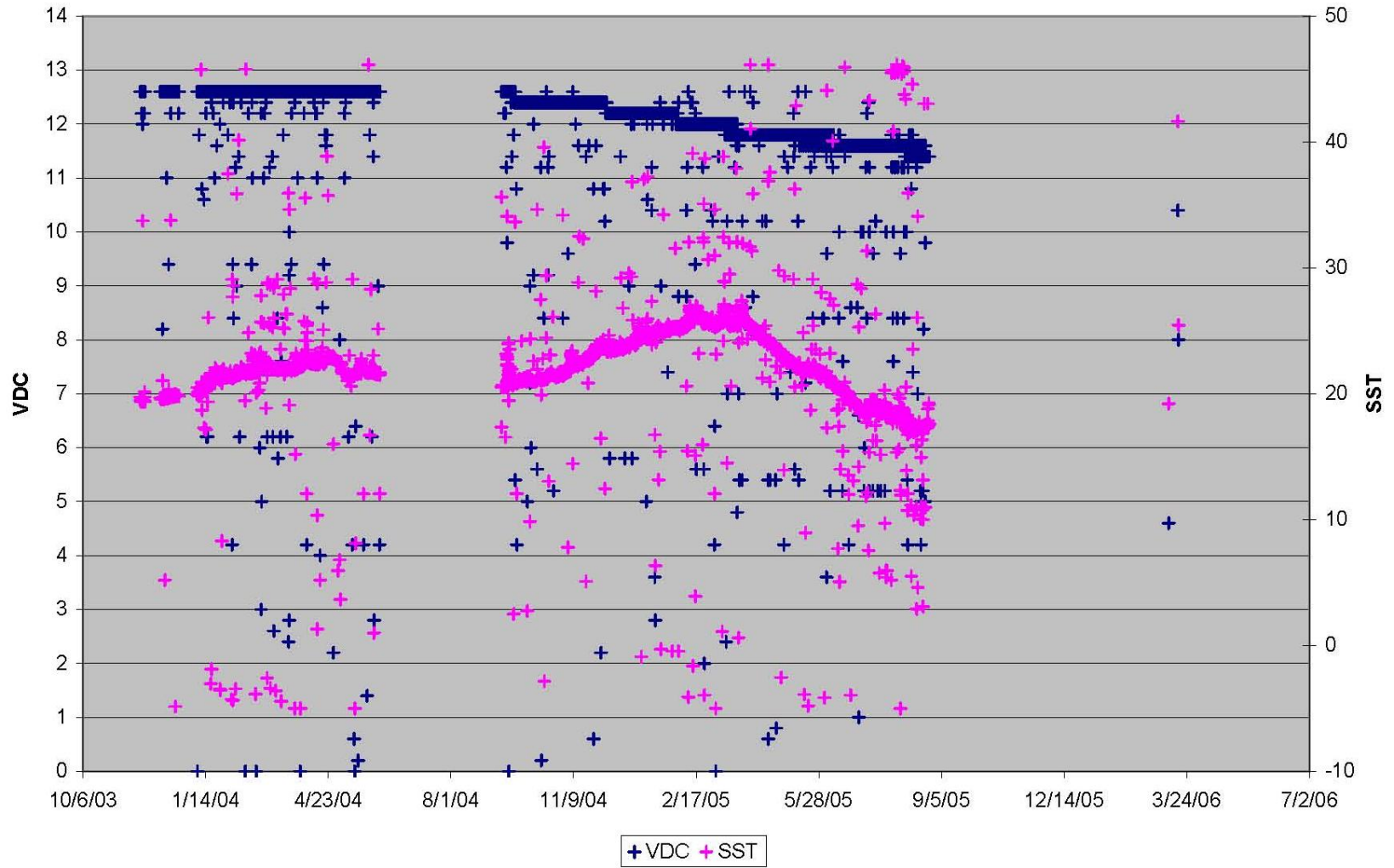


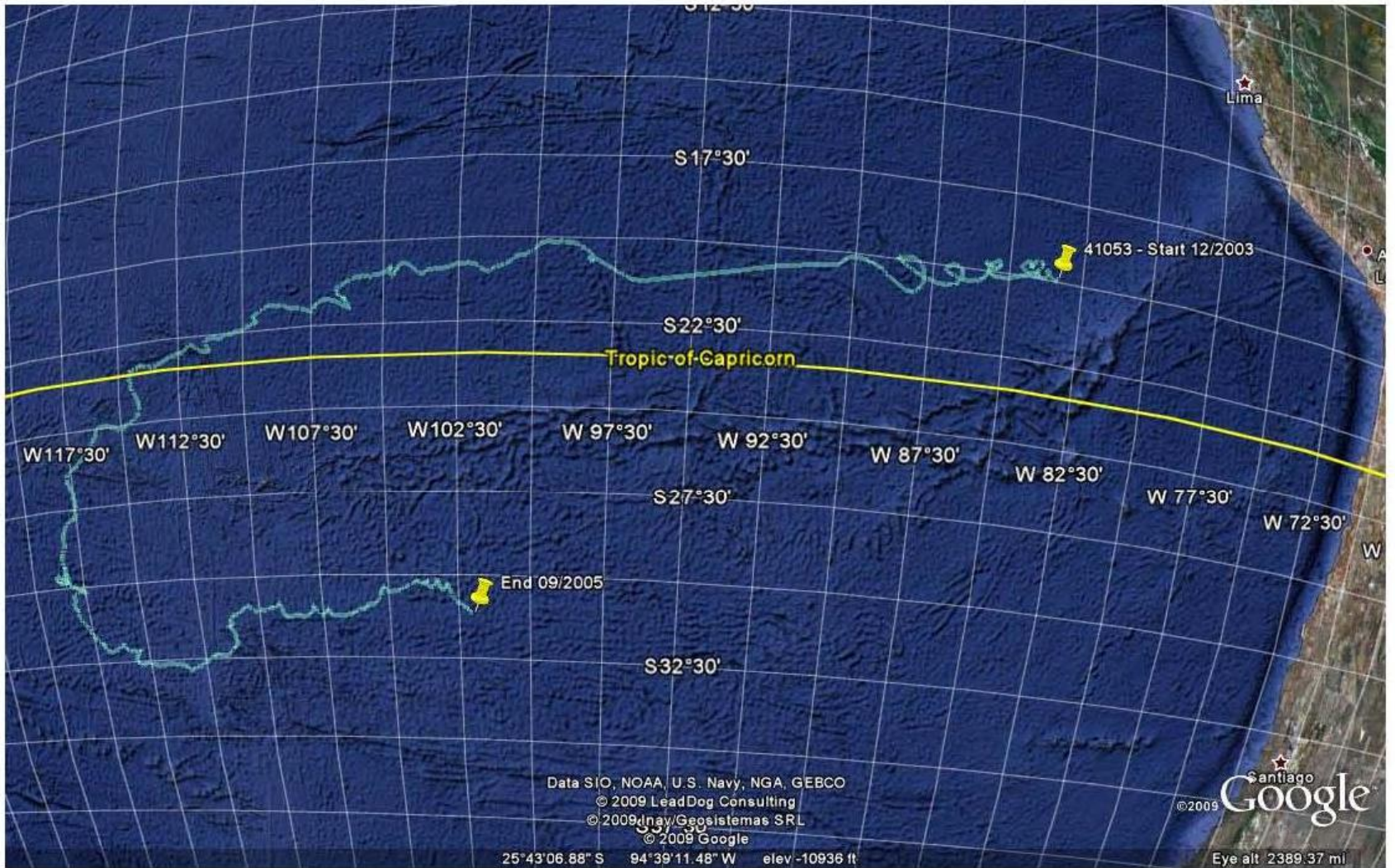
41052 - VDC,SST



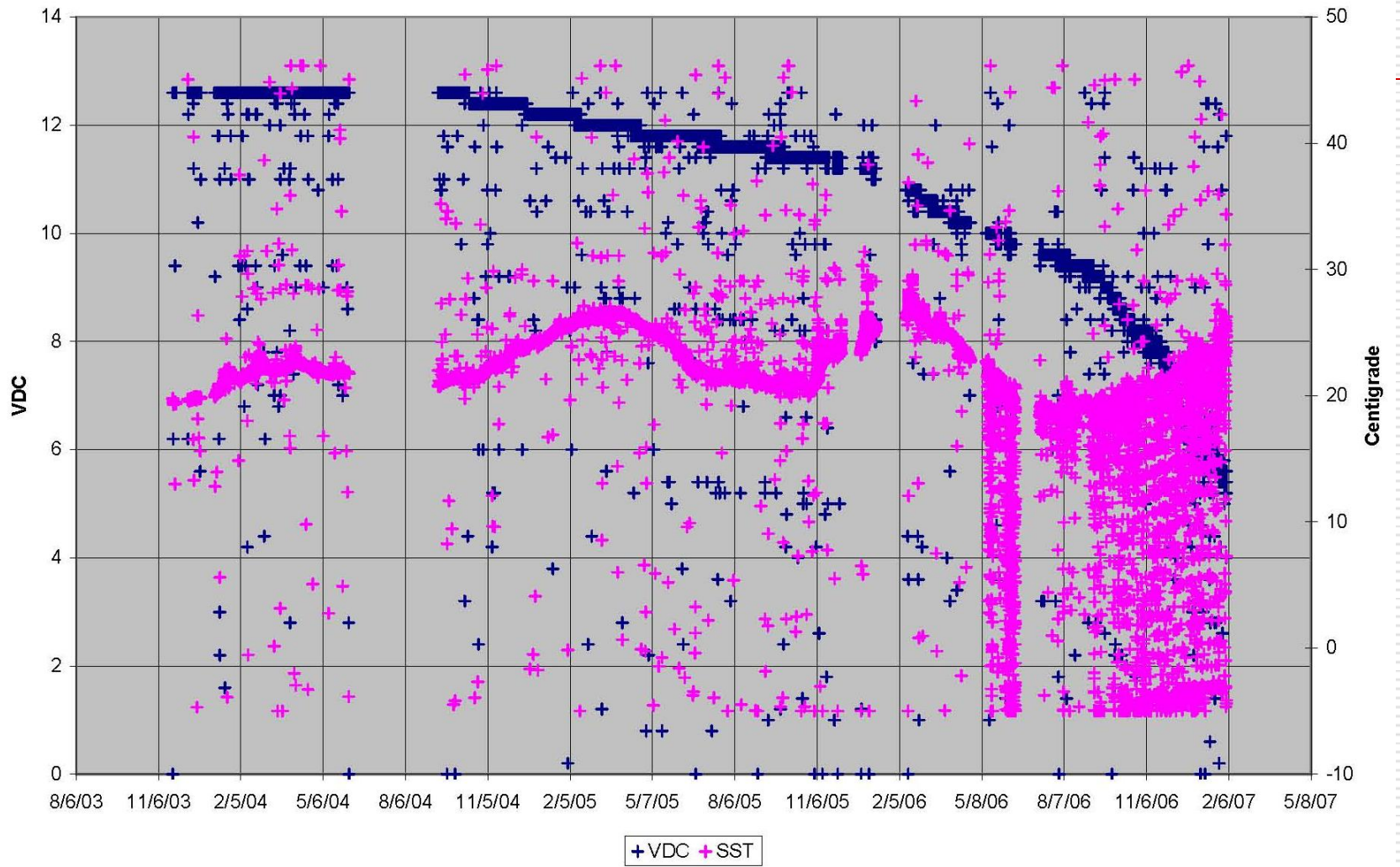


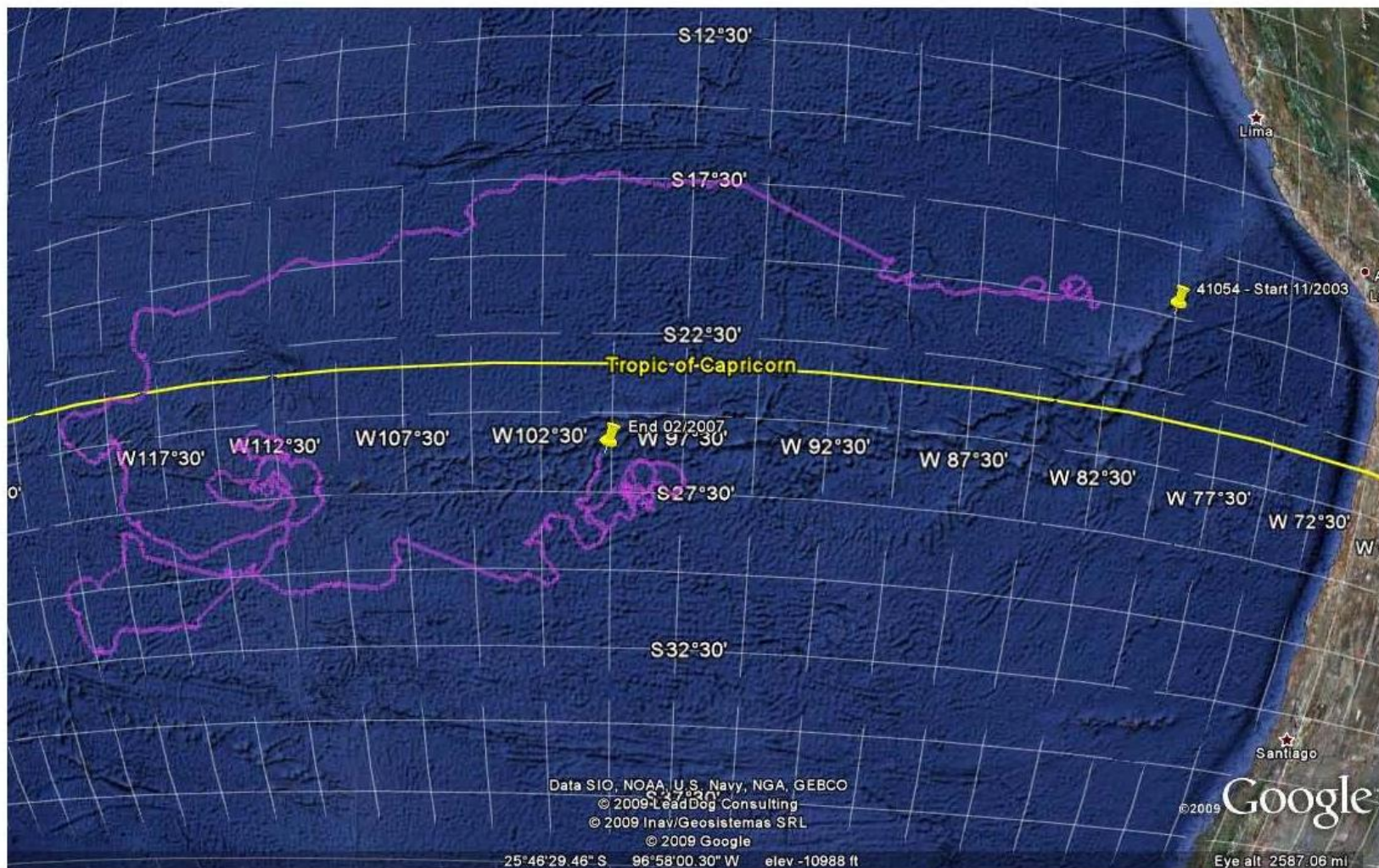
41053 - Voltage and SST



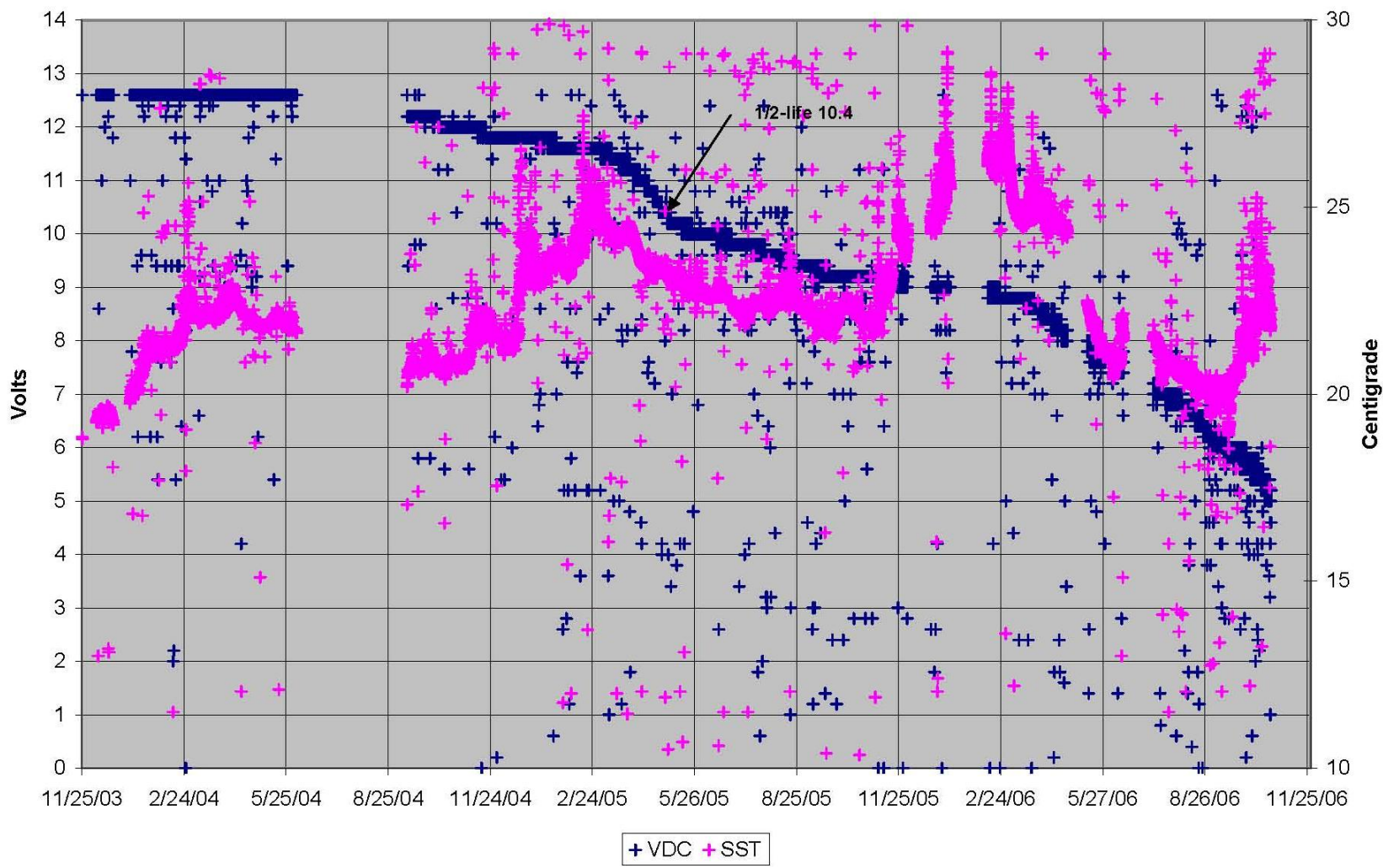


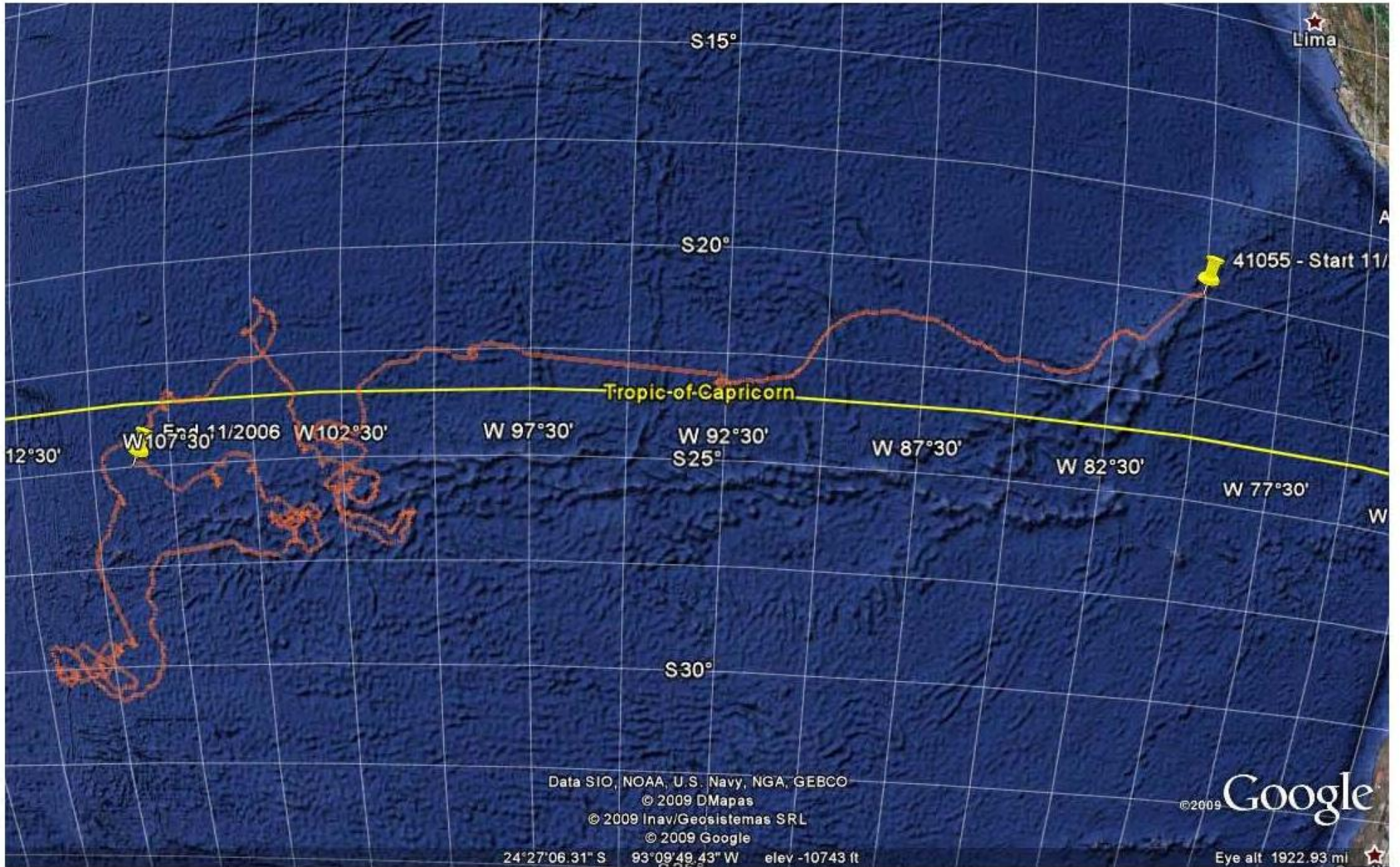
41054 - VDC and SST



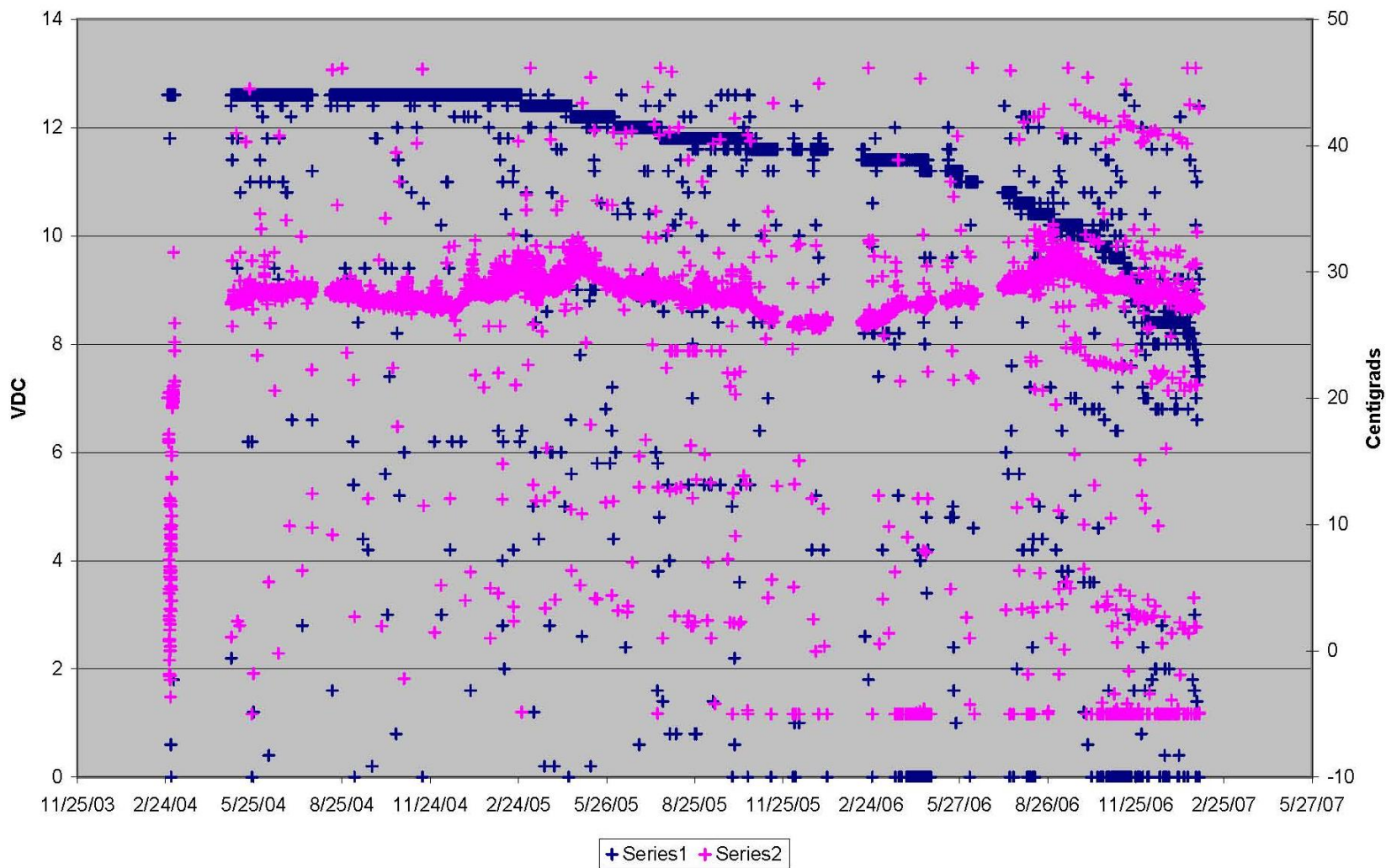


41055 - VDC, SST

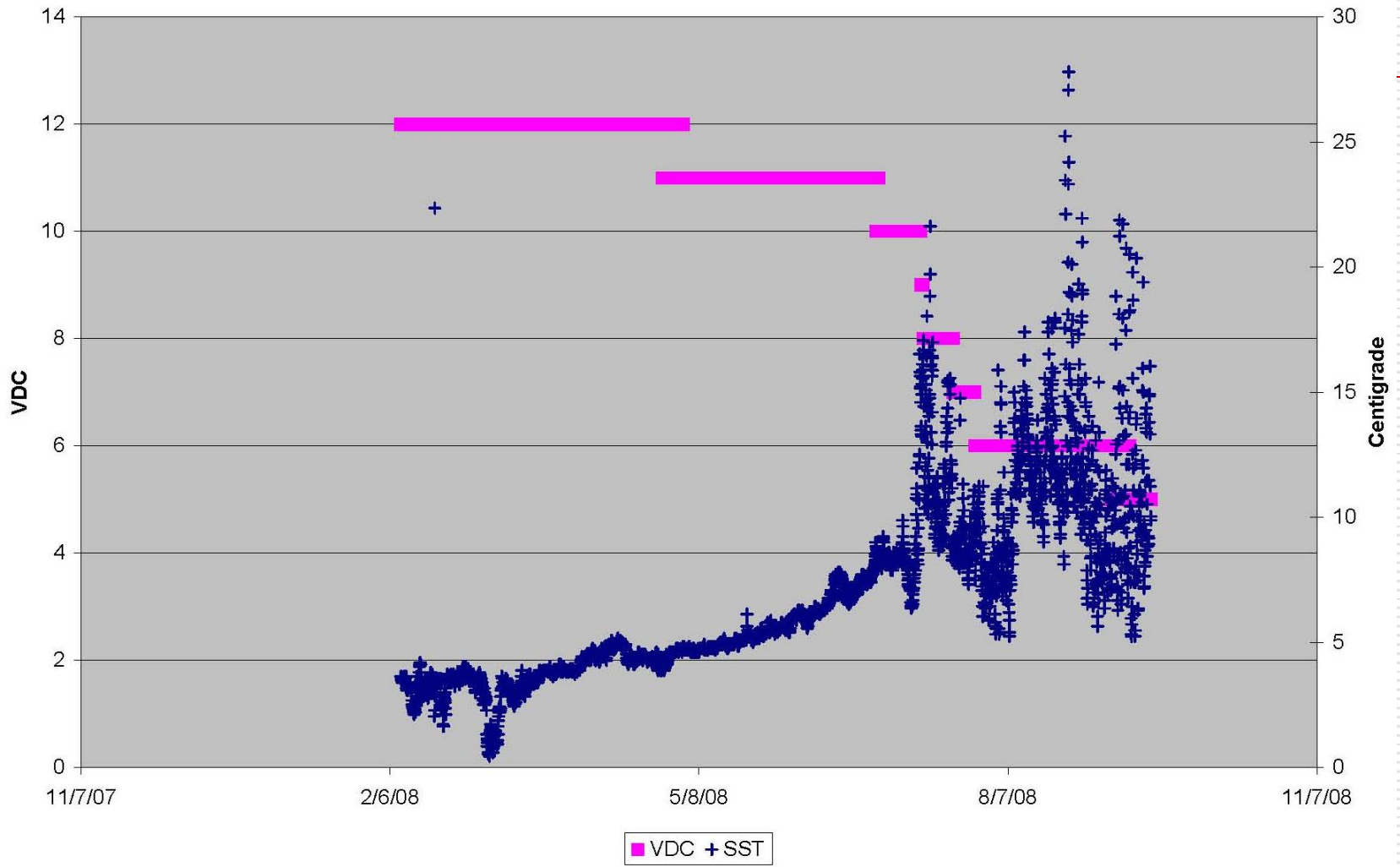




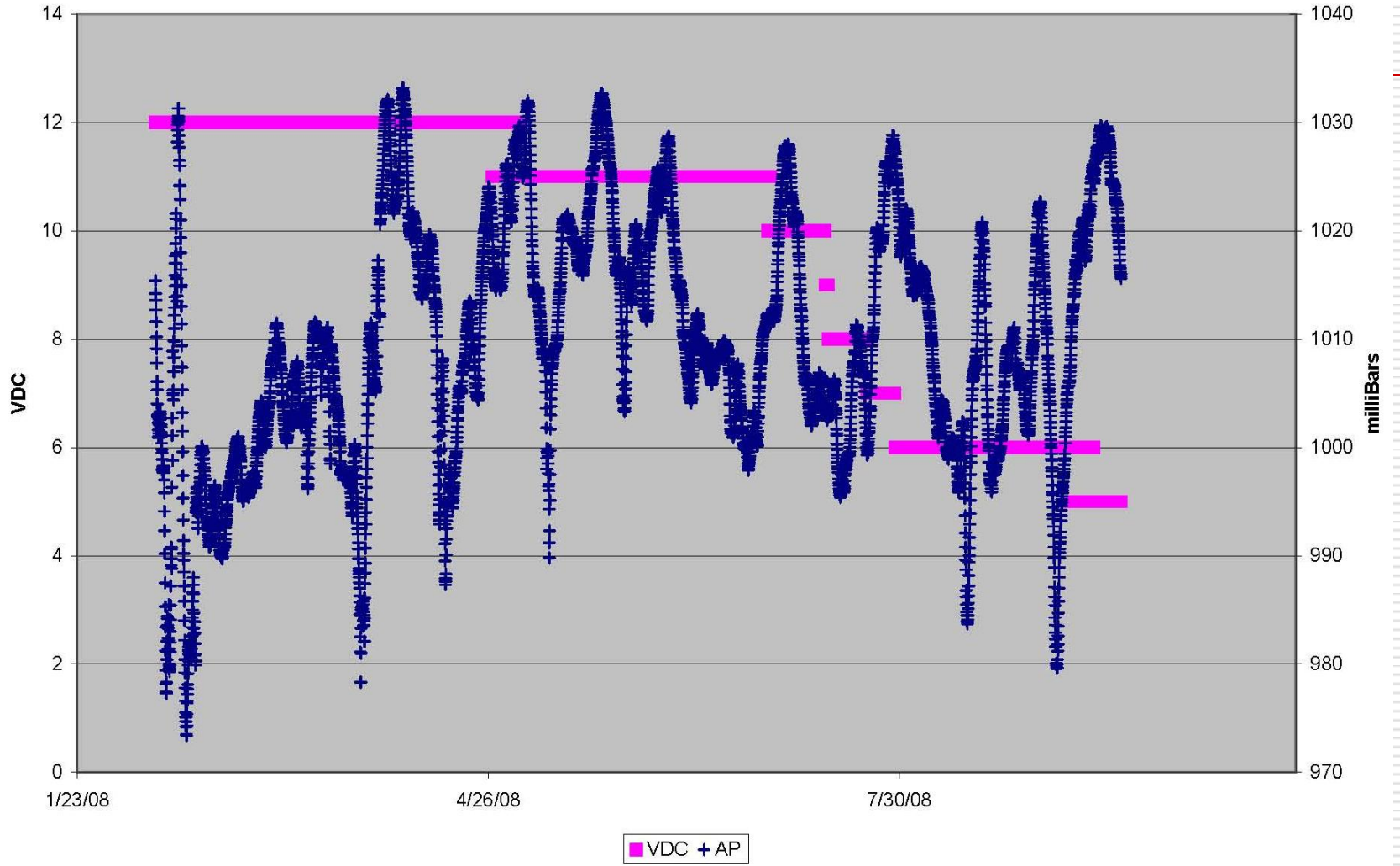
43693 - VDC and SST



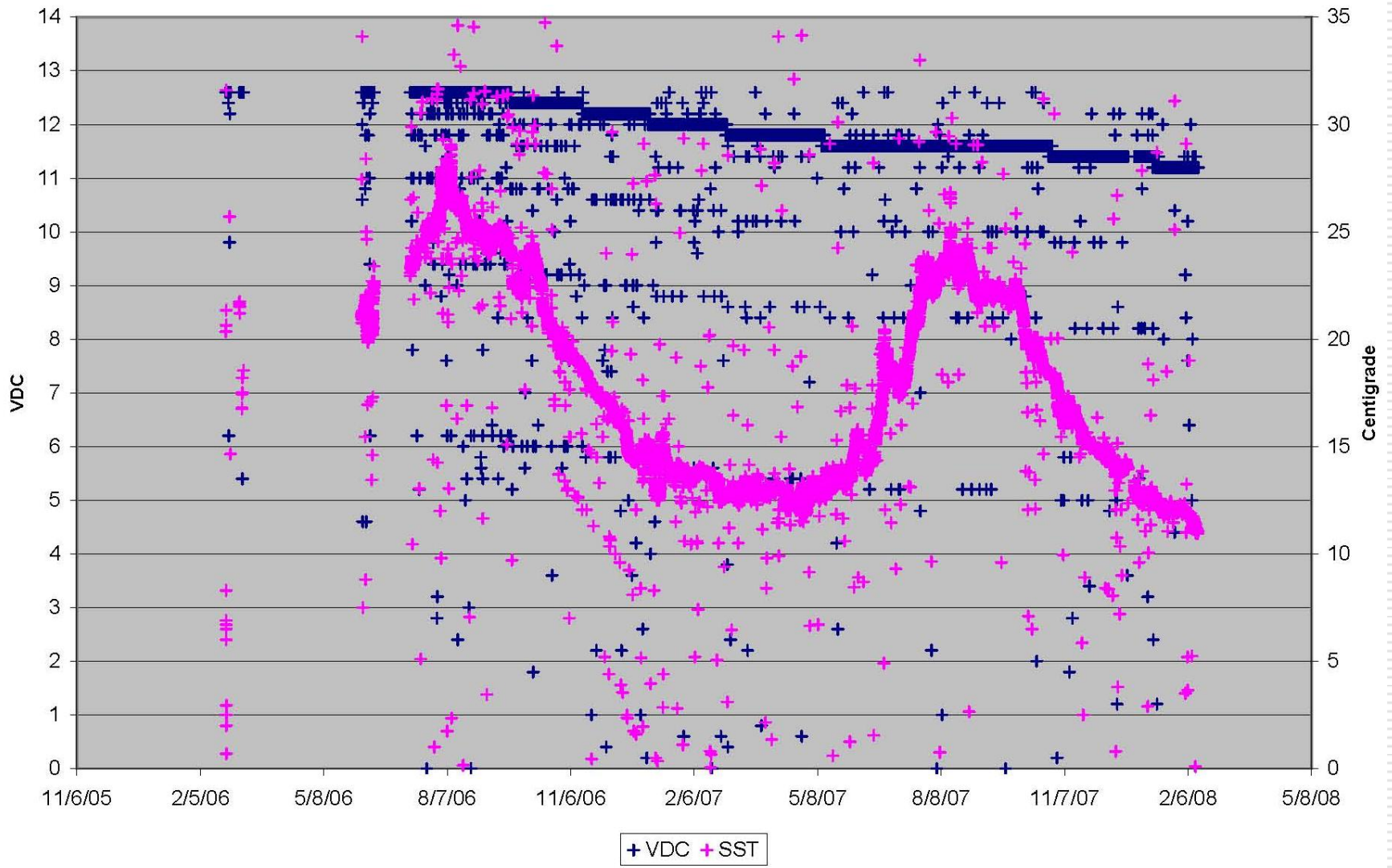
48835 - VDC and SST

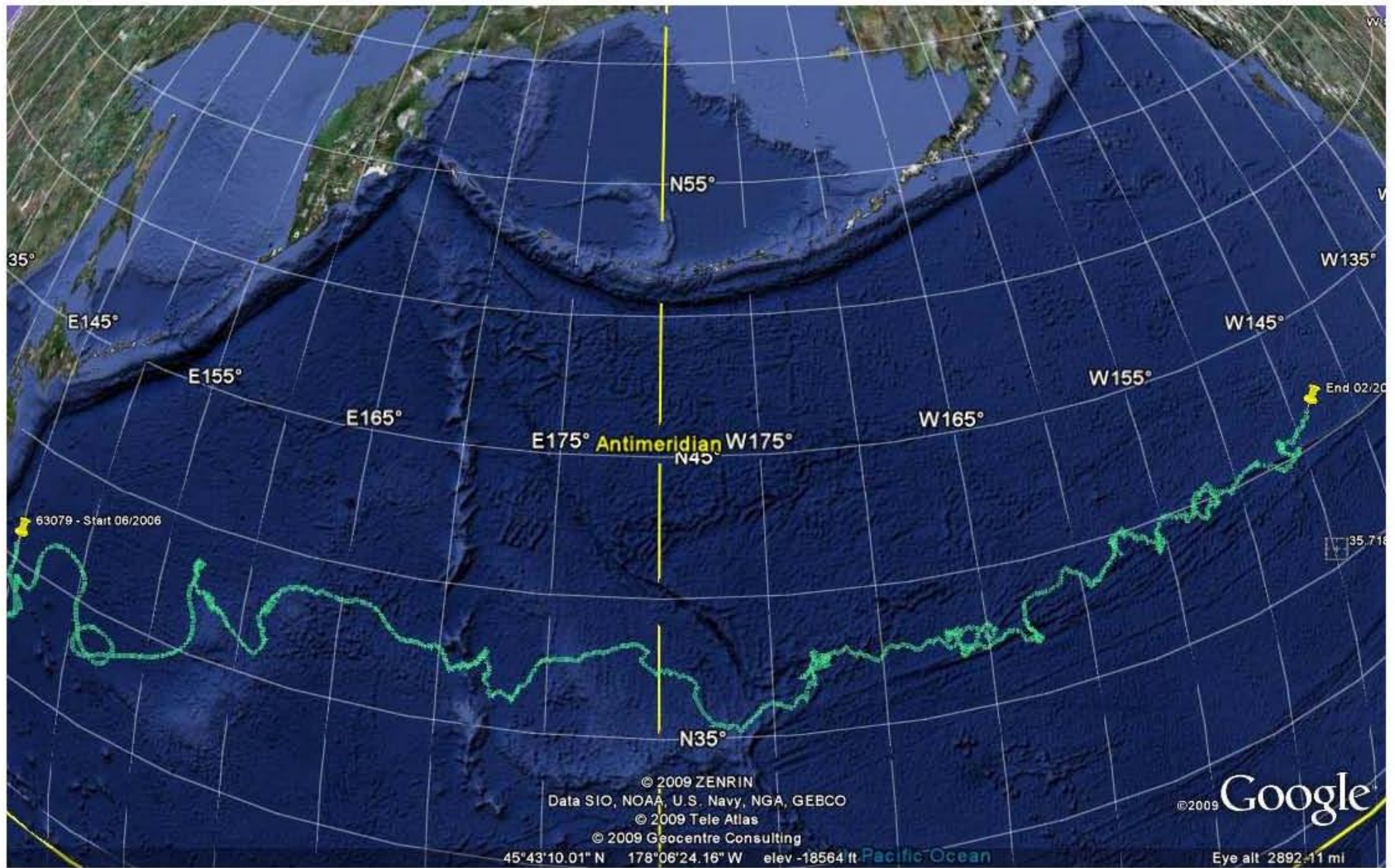


48835

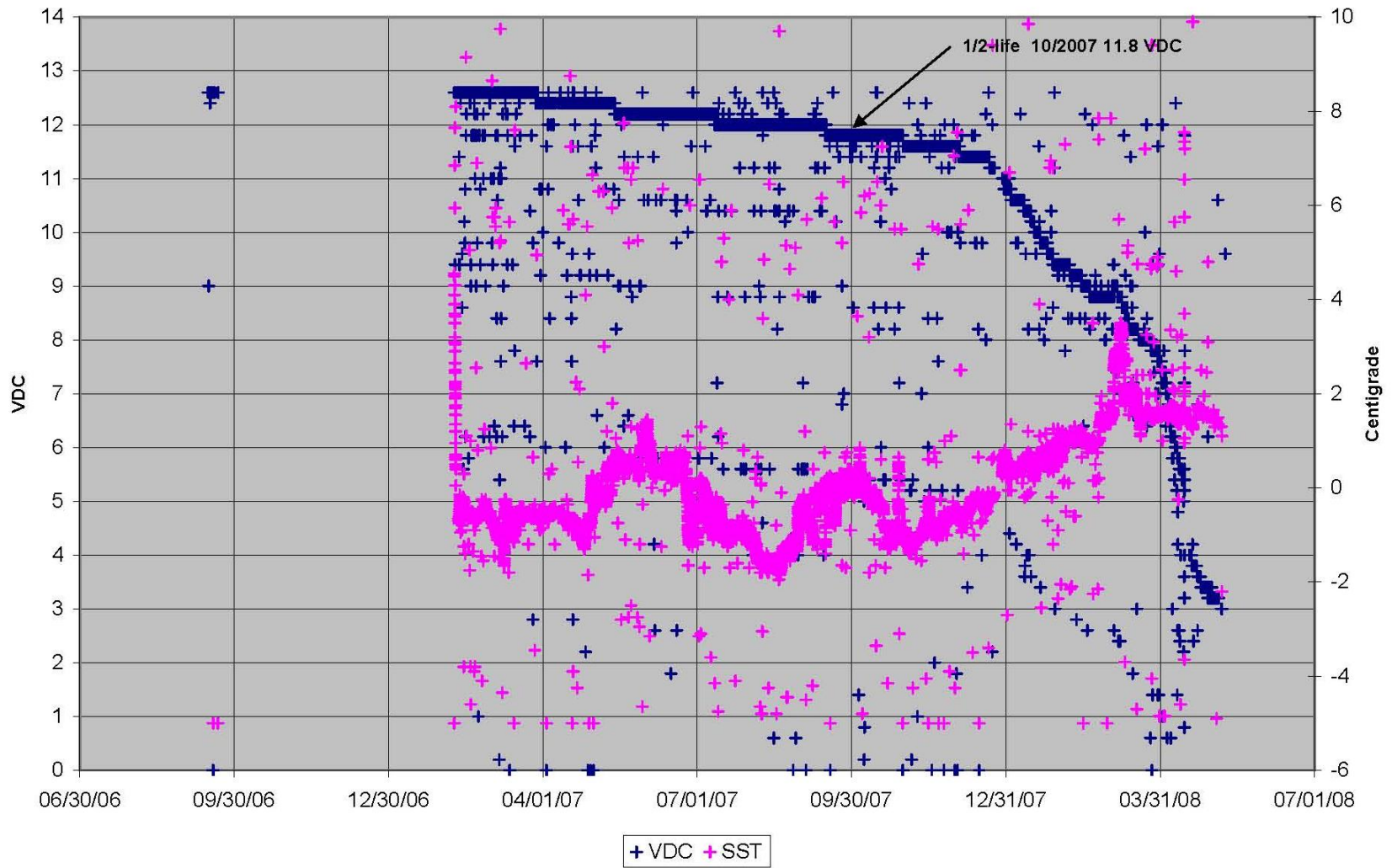


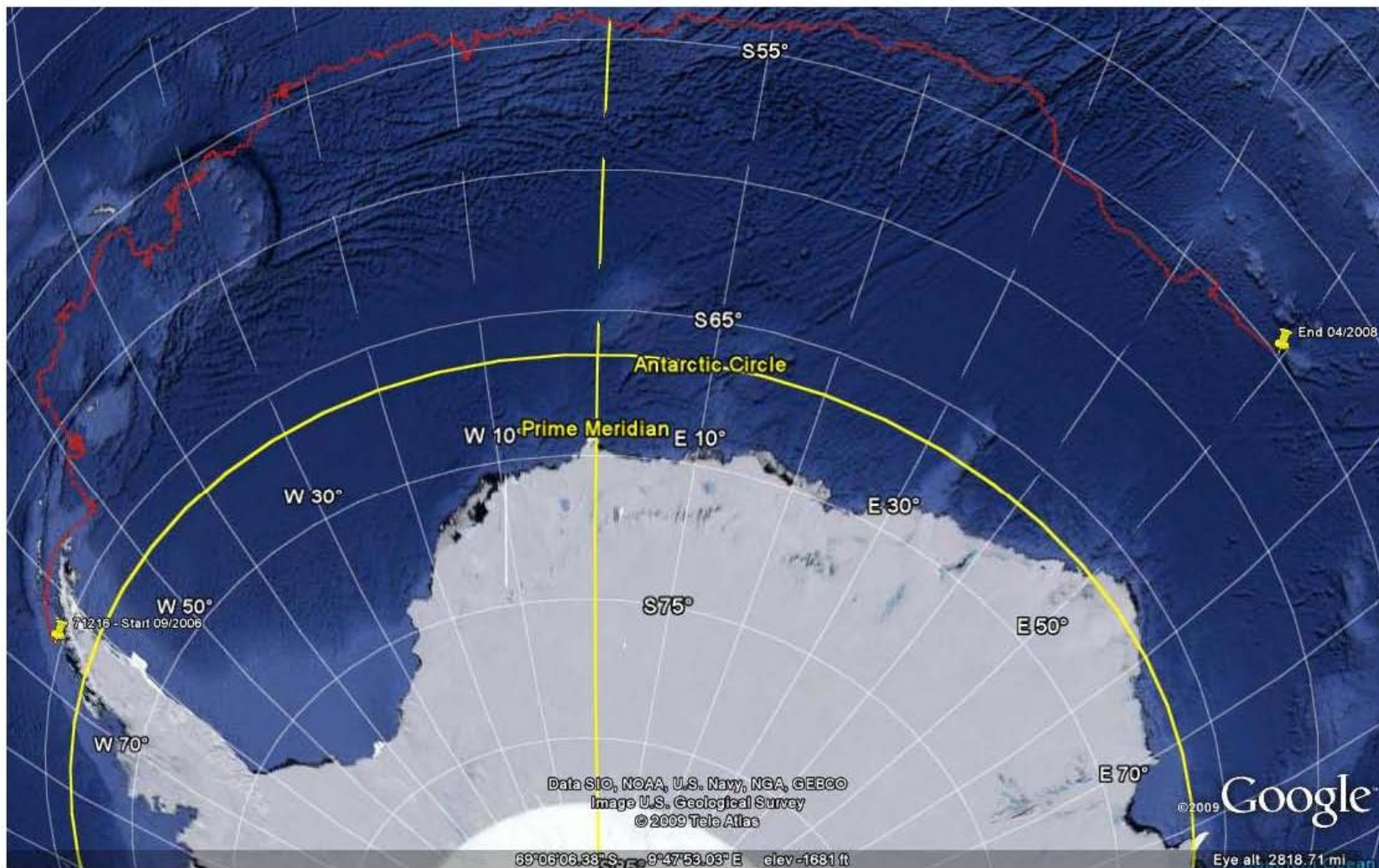
63079 - VDC and SST



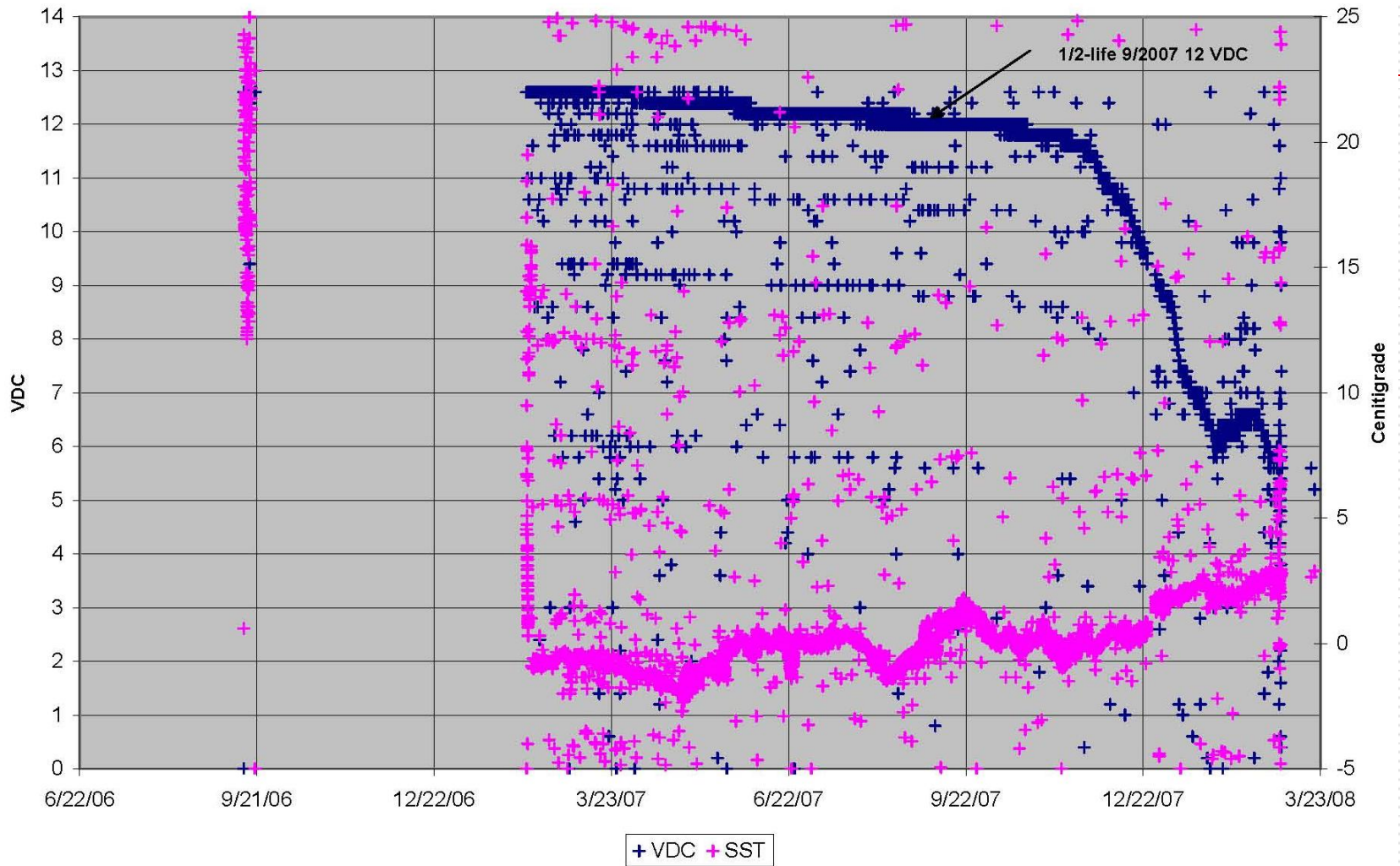


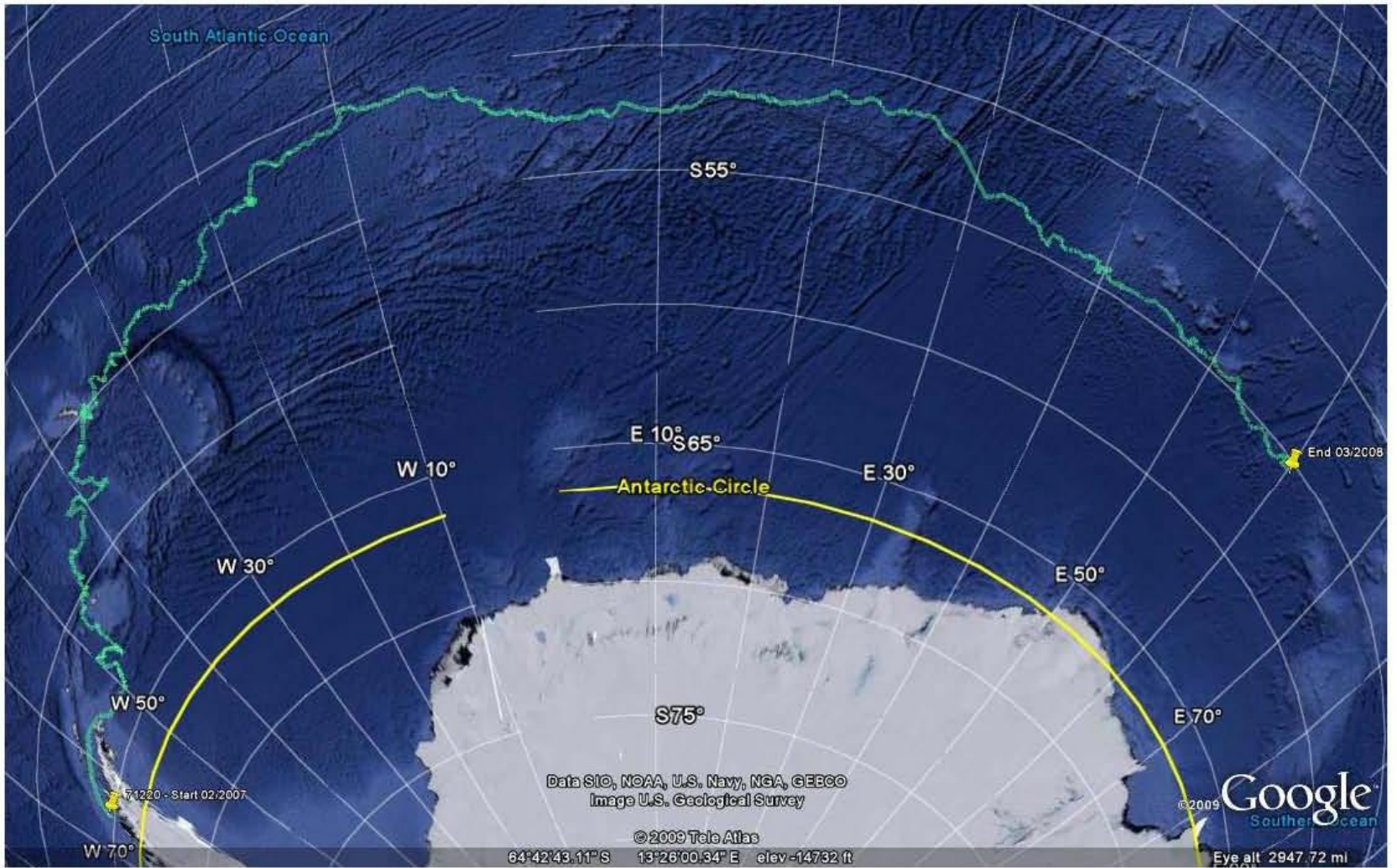
71216 - VDC and SST



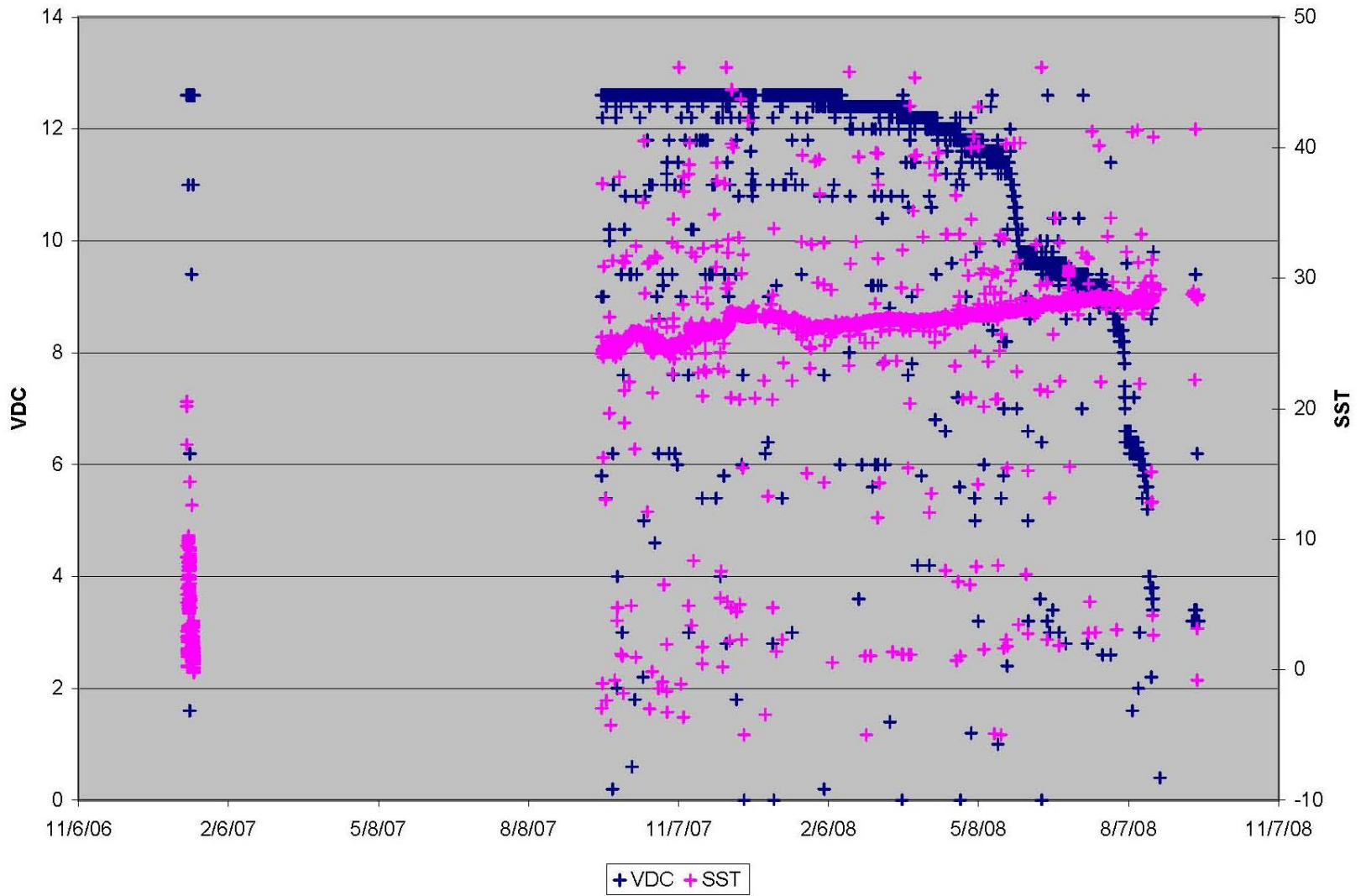


71220 - VDC, SST

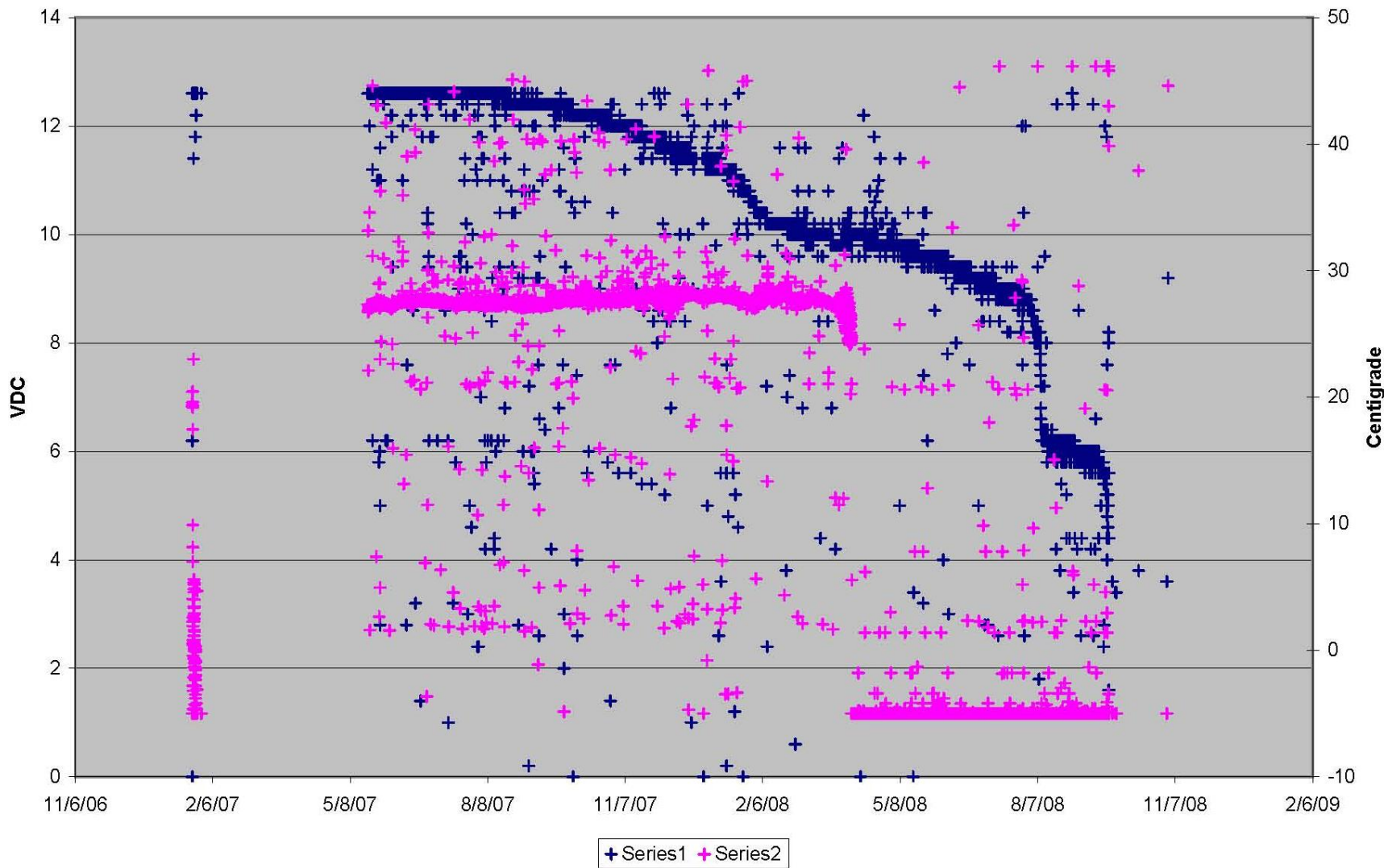




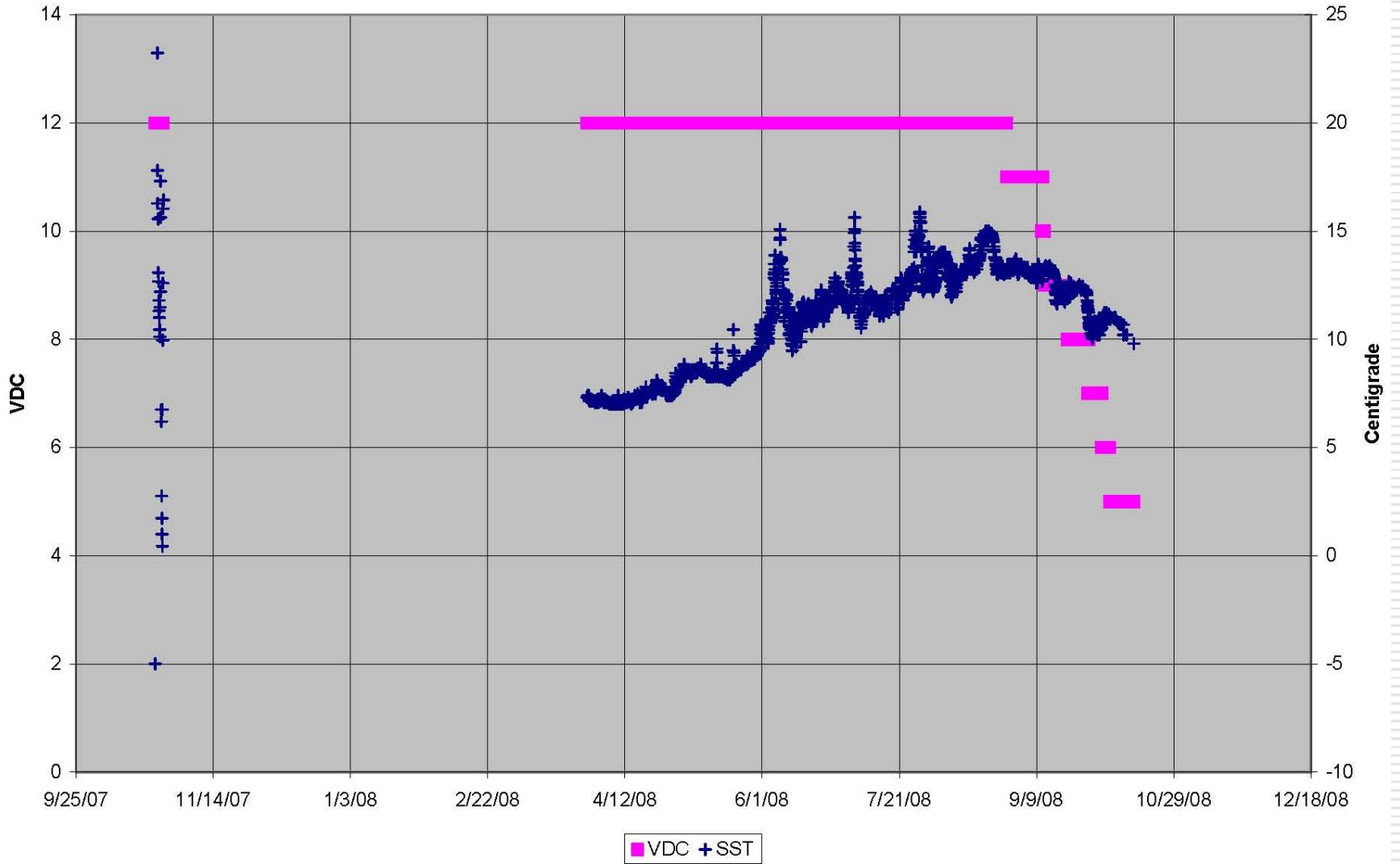
71955 - VDC and SST



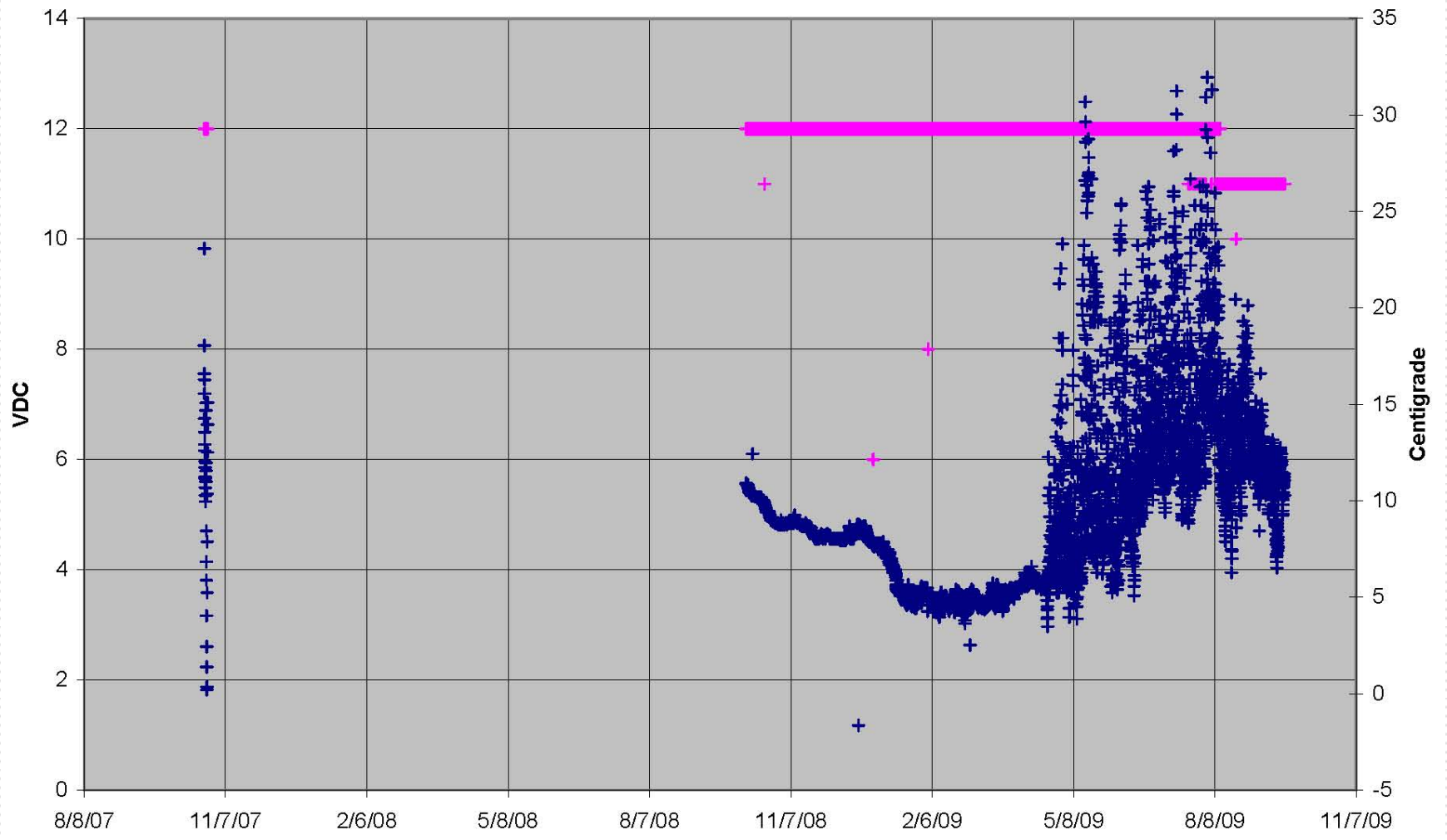
71963 - VDC and SST



78689 - VDC and SST



78690 - Battery and SST



+ VDC + SST