

## ***Interactive comment on “Technical Note: Animal-borne CTD-Satellite Relay Data Loggers for real-time oceanographic data collection” by L. Boehme et al.***

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### Summary

This Technical Note on animal-borne CTDs is a useful contribution in that it updates previous descriptions and examples of use of this type of device already in the literature. The note does not describe a new concept, rather it provides a good background to the higher accuracy sensors that enable the instrument to provide data suitable for research use in physical oceanography. However, there are a few areas of weakness as set out below, and some specific points for the author to consider.

General areas of weakness

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The note argues, rightly, that energy efficiency is paramount. Yet it tells us nothing at all about the energy budget within the tag, it tells us nothing about the energy available in the lithium cell. For the note to be useful to readers, this is vital information. We need to know the initial energy within the cell (most useful if its temperature dependence is also covered). This could be by reference to the cell type and data sheet, for example. We need to know the energy budget between the major items: the control microprocessor (e.g. when sampling, when idle, when compressing data), the Argos transmitter (e.g. in Joules per bit), and the sensors (C, T and D). The way the note deals with inter-comparison is not sufficiently rigorous or quantitative. Measures such as  $\pm 0.005$  are used for temperature for example within the text, without any note as to whether this is one sigma, two sigma etc. Table 1 does have rigour, in that it includes a figure for the standard deviations.

### Specific points

There is no mention of the ethical issues or permission issues connected with adding this instrument to a marine mammal.

P1262 line 11 – it is not clear to me how minimizing size maximises energy efficiency.

P1262 line 14 – it is not clear to me why the paucity of comparison data means the accuracy of the CTD is reduced, surely that it an intrinsic property of the sensors?

P1264 line 22 – the risk of spatial aliasing is not discussed.

P1265 line 5 – the battery is unlikely to be a “lithium-ion”. That is the term usually reserved for secondary lithium cells. I doubt that the cell used here is rechargeable. Primary lithium cells use lithium metal rather than lithium-ion, it would be useful to know the exact type of chemistry, e.g. lithium thionyl chloride, or sulphuryl chloride etc.

P1266 line 20 – it is an oversimplification to state that small non-pumped sensors are inevitably less accurate. The (now admittedly little used) Neil Brown Instrument Systems Mk3 4-electrode conductivity cell was both smaller and more accurate than

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the larger cell described here.

P1267 line 18 – remote sensing specialists would, I think, disagree strongly that the accuracy of space-borne SST measurements renders them insufficient for climate change studies.

P1268 line 1 – there is no discussion of the temperature sensitivity of the pressure sensor.

P1270 line 19 – here, and elsewhere, satellite data 'bandwidth' is mentioned. It is strictly not 'bandwidth' but 'throughput' that is meant.

P1274 line 25 –The authors have shown enough of a quantitative analysis to convince me that the initial target of 0.02 accuracy in salinity has been achieved.

Typographical errors etc.

P1266 lines 5 and 6 – Should not weddell and california begin with upper case letters?

P1266 line 25 – no need for apostrophe in 1950's, it is not a possessive.

P1271 line 4 – 'poin' should be point.

P1278 line 22 – 20033 should probably be 2003.

P1280 line 28 – volume 2 for the JAOT paper is not right, it is part 2 of volume 20

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Interactive comment on Ocean Sci. Discuss., 6, 1261, 2009.