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Ocean Science
Discussions

Interactive comment on "A computational method for determining XBT depths" *by* J. Stark et al.

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The manuscript "A computational method for determining XBT depths" by Stark et al. addresses an interesting topic within the scope of Ocean Science: accurate determination of the long-term trends in ocean heat content. The approach combines forward-stepping calculation which incorporates all of the forces affecting XBT devices during their descent.

The paper is clearly presented and addresses a challenging technical issue. As a modeller I fully appreciate the importance of accurate XBT measurements. However in my opinion the figures 5 -7 in their present condition do not make any favours to the material.

Fig. 5 – if possible please increase horizontal/vertical aspect ratio as it is impossible to distinguish between the curves;

Fig. 6 – horizontal axis (0-2500 sec) against horizontal axis (0-400 sec) for Fig. 5 where depths are between 0 and 2500 m. That gives us 2.5-3 % deviation for the whole range of 0-2500 m, and decrease of deviation toward zero for depths of 12,500 m. Is it relevant? T5 standard is 1830 m, others (T4/T6 etc) are even more shallow. What this 3 % of deviation is like in meters? Is it like 18 meters for depths of 600 m? In this case it is quite a lot. The GO project cruise in the Mediterranean (the Gulf of Cadiz 2007) produced 2 collocated datasets, oceanographic (XBT/XCTDs) and seismic where this difference between positions of reflectors and XBT/XCTD star cases was spotted, however I doubt it was that high. You validated your results against manufacturer's FRE, what about validation against collocated with XBTs seismic legacy data?

Fig. 7 – insufficient choice of horizontal scale limits. Also – I think it would win from showing the measured profile without manufacturer FRE or your model applied.

Also in the text (what I've spotted as I mostly concentrated on your figures):

1. There are more recent publications available on this subject, like Boyer et al., 2011: Investigation of XBT and XCTD Biases in the Arabian Sea and the Bay of Bengal with Implications for Climate Studies;

2. In "Concluding remarks" section, line 11-14: "A significant advantage of the [...] method that it can be applied for any local environmental conditions (???) such as water temperature." Please rephrase. You stated it correctly in your abstract.

3. Statements related to your Fig. 6 should be re-written accordingly.

Interactive comment on Ocean Sci. Discuss., 8, 1777, 2011.