

## ***Interactive comment on “Empirical correction of XBT fall rate and its impact on heat content analysis” by M. Hamon et al.***

### **Anonymous Referee #1**

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The authors empirically corrected XBT biases on depth surfaces, removing the “bump” in the ocean heat content (OHC) curve in the 70’s. The method that they use to correct the XBT’s appears to be a combination of previous corrections, as it computes correlation coefficients on depth surfaces (Levitus et al. 2009), and uses a depth and temperature offsets (Gouretski and Reseghetti 2010). The end results are different coefficients for the XBT correction and would be publishable in a different paper. However, I recommend that this paper be rejected. The XBT corrections are interesting, however they are presented in a context that completely ignores work that has already been done on OHC and XBT corrections. For example the papers main finding, that correcting the XBT biases removes the “bump” in the 70’s, was already shown in Domingues et al. (2008). Oddly the Domingues paper is not even referenced! The paper goes on to ignore other recent papers about OHC and XBT bias corrections (Lyman et al. 2010,

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Interactive Discussion

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Ishii 2009). This paper should be completely rewritten, with an emphasis on how their XBT correction differs from previously published corrections. Discussion of the impacts on the OHC curve need only reference previous work and not be a focus of the paper.

Domingues, C. M. et al. (2008) Improved estimates of upper-ocean warming and multidecadal sea-level rise. *Nature*, 453, 1090–1093.

Ishii, M. & Kimoto, M. (2009) Reevaluation of historical ocean heat content variations with time-varying XBT and MBT depth bias corrections. *J. Oceanogr.*, 65, 287–299.

Lyman, J.M., et al. (2010) Robust Warming of the global upper ocean. *Nature*, 465, 334–337.

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Interactive comment on *Ocean Sci. Discuss.*, 8, 291, 2011.

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