The origin of XBT errors during 1998-2009

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XBT bias and fall-rate workshop
Hamburg, August 2010

XBT minus Argo isotherm depth differences

DiNezio and Goni 2010

global and positive 1 σ -significant depth differences
XBT minus Argo isotherm depth differences

- Depth differences are ~3% of Argo depth
- H95 no longer necessary during 2000-2009?
Effect of depth error on temp. differences
Effect of temp. error on depth differences
true

temperature error

depth error

NOAA
Depth vs. temperature differences

- 0.15 °C bias
- 3% of depth bias
Signature of temp. error on XBT-Argo diff.

ML : $\partial T / \partial z < -0.02$ K/m
Median XBT minus Argo temp. = 0.07 K
Spatial structure of temp. differences
z differences when temp. error is removed.

- depth differences are \( \approx 1.5\% \) of Argo depth when 0.07K temp. error is removed.
Conclusion 1

- Temperature error of ~0.1 K

Question 2

- Until when is H95 valid?
64 CTD-XBT profiles – 1998 24N section

lots of scatter
(compare with Gustavo’s results)
depth error 0.29 ± 0.02 %

temp. error -0.03 ± 0.03 ºC
Until when is H95 valid?
Conclusions

• Pure temperature bias of 0.07 K during 2000-2009.


• Hanawa 1995 correction already inadequate by 1998?

• XBT-Argo differences consistent with side-by-side experiment in tropical Atlantic, but small compared with prev. experiment.