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Ocean Science Discussions

Interactive comment on "Metrics of hurricane-ocean interaction: vertically-integrated or vertically-averaged ocean temperature?" *by* J. F. Price

Anonymous Referee #2

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In this paper the author introduces a new metric, meant to replace the upper ocean heat content (i.e. depth integrated temperature), to be used for prediction of ocean effects on tropical cyclone intensification and/or weakening. This metric is a depth averaged temperature, and it is much more physically sound than the formerly used. The two metrics give very similar results in warm deep ocean regions, but substantially differ over shallow and/or cold regions. The paper is very well written, and it is worth of publication on Ocean Science as it is. I think it will be the base for many studies to come. Here, the metric is presented and discussed, but it is not tested in real situations for correlations with tropical cyclone intensity tendency. No doubt many people will use it and test it, showing its power over the old one.

In summary, I wish many papers were as good as this one!

I only have a minor comment, that might be a suggestion for the author, but it's not a requirement for publication:
In figure 7 it is shown that $T_{\overline{100}}$ and $T_{\overline{d}}$ are highly correlated for the Argo profiles, suggesting that rather than computing the mixing depth d, one could simply use the fixed depth d for the calculation of the depth averaged temperature. As the author specifies in the text, this is valid for a category 3-4 hurricane (page 924, first three lines) which gives mixing depth d between 85 and 125 m. However, the correlation might be different for weaker and stronger tropical cyclones that induce mixing to different depths, and in these cases the use of $T_{\overline{100}}$ might not be the best one. To verify this sensitivity, it would be good to add a figure in which the correlation between $T_{\overline{100}}$ and $T_{\overline{d}}$ is shown for different hurricane parameters and for the same ocean conditions (e.g. a figure of correlation coefficient between $T_{\overline{100}}$ and $T_{\overline{d}}$ for the Argo profiles as function of maximum surface stress and translation speed of the tropical cyclones).

Interactive comment on Ocean Sci. Discuss., 6, 909, 2009.

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Interactive Comment