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## ***Interactive comment on “A model-based assessment of the TrOCA approach for estimating oceanic anthropogenic carbon” by A. Yool et al.***

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The title of this manuscript is misleading. This manuscript presents a comparison of results from three different models, not an objective assessment of the TrOCA approach. There are many inaccuracies in this manuscript. For example, the text indicates that the TrOCA method was tuned using the WOCE I01 cruise data. This is not true (see Touratier et al., 2007). The text further indicates that “negative concentrations are common with TrOCA” however Figure 7 shows that only the  $\delta^{13}C^*$  results of globally averaged vertical profiles present negatives values. Large negative concentrations are much more common with  $\delta^{13}C^*$  than with TrOCA. The authors rightly indicate that the OCCAM model presents (like all 3-D models) some deficiencies in the hydrography but then, they use these model results as “reference”! There are many hypotheses in

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this OCCAM model (hydrography, redfield ratios, monthly restored surface freshwater, salinity, air-sea fluxes, etc.) that influence the model results. These results from a deficient model should NOT be taken as “reference”. The Taylor diagrams presented in this manuscript are meaningless. A Taylor diagram can be used only with measured data as reference. I could go on. . . . The only conclusion that can be drawn from this study is that results from the OCCAM 3-D model are different from the TrOCA and from the iADC\* models. This is not surprising (since the various hypotheses of these three models are different)! There is nothing new here.

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