Ocean Science
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Interactive comment on "Evaluation of fraternal versus identical twin approaches for observation impact assessments: An EnKF-based ocean assimilation application for the Gulf of Mexico" *by* Liuqian Yu et al.

Anonymous Referee #2

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The revision is good, and the paper will be ready for publication after minor revision.

I still have a major issue with terminology.The experiments where observations are sampled from the same model are correctly labeled as identical twin experiments. However, the experiments where observations are sampled from HYCOM and assimilated into ROMS are not fraternal twin experiments. The term 'fraternal twin' needs to be dropped in describing these experiments.

The category 'fraternal twin' is reserved for the case where observations are sam-

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Discussion paper

pled from one model, and then assimilated into the same model that is set up with a substantially different configuration. This is possible with HYCOM, for example, because this model contains multiple choices of numerical schemes and subgrid-scale parameterizations. These different choices can enable the version used to generate observations behave much differently from the version used to assimilate the observations. Even though the same model is used, the two different configurations can be set up to substantially behave like different ocean models.