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Interactive comment on "Influence of frontal cyclones evolution on the 2009 (Ekman) and 2010 (Franklin) Loop Current Eddy detachment events" *by* Y. S. Androulidakis et al.

Anonymous Referee #2

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Review of Androulidakis et al.: "Influence of frontal cyclones evolution on the 2009 (Ekman) and 2010 (Franklin) Loop Current Eddy detachment events"

This is a detailed manuscript describing the evolution of the Loop Current (Gulf of Mexico) during two summer events of eddy detachment. The authors use an operational simulation (that assimilates satellite data) in combination with in situ (mooring) and satellite records. After an evaluation of the model against observations, the evolution of the Loop current is analysed from model outputs. The authors also investigate the role played by slope processes based on the associated Potential Vorticity field. The article is well written although the large number of acronyms used difficult sometimes the reading. The organization could be slightly modified, as in my opinion most of the

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material that is included in the Discussion section could be in fact part of the Results section.

I consider this manuscript fits well within the scope of Ocean Sciences and that it can be published after minor review.

My specific comments are presented below:

1) Title: This is a quite long title. I suggest removing the Ekman and Franklin names from the title.

2) Abstract: again I am not very convinced in the utility of giving a name to the two shedding events studied in this study.

3) Abstract: The Campeche Bank is mentioned in the abstract, although many of the readers may not know where it is,. . . I recommend not being so detailed in the abstract.

4) Abstract: 'positive vorticity', replace by 'positive potential vorticity'

5) Objectives: To facilitate the reading of the paper, I would try to avoid acronyms in the description of the objectives (same holds for the titles of sections)

6) Model evaluation: The authors show the temporal evolution of temperature at different depths given by the moorings in comparison with the simulation. What about salinity? Is it a relevant variable? Are the T-S diagram from model and observations similar?

7) Figure 3: I suggest including here a sequence of SSH from model and altimetry in order to illustrate the detachment events. It is shown in Figure 5 but only for the model.

8) Discussion: as stated above, I would merge the Results and Discussion sections in one single section entitle Results and Discussion

9) Section 5.1: 'The cyclonic LFCEs drive colder waters to upper layers through upwelling'. This is a too simplistic view, as this process takes place only during the for-

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mation of a cyclone. Once it is formed, dipoles of upwelling/downwelling will be usually located on the edges of the eddy, according to QG theory (see for example Pollard and Regier, 1992).

10) Section 5.2.2: I found very interesting this section on the use of PV for the examination of slope processes. However, I think it should be better justified. It is not very clear why the authors choose this analysis of PV. Maybe a slightly longer introduction of the section referring to previous publications would help.

11) Appendix A: this appendix is useful as it explains well the potential vorticity analysis (although the justification of the application needs to be expanded, as mentioned above). How are the errors estimated (lines 20-35)?

Interactive comment on Ocean Sci. Discuss., 11, 1949, 2014.

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