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Ocean Science Discussions

Interactive comment on "Deep currents in the Gulf of Guinea: along slope propagation of intraseasonal waves" *by* C. Guiavarc'h et al.

Anonymous Referee #1

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In this nice study the authors use a combination of numerical models and observations to elucidate the nature of observed bi-weekly variability of the currents along the coast of the Gulf of Guinea. The comparison of results from a primitive equation and linear models clarifies the role of nonlinearities in the spatial and temporal structure of the intraseasonal oscillation, while the use of sensitivity experiments elucidate the influence of the coastline geometry in explaining the dissymmetry of the signal to the north and south of the equator. The paper is also well written and clear. I recommend it for publication after some minor revisions that are mainly intended to clarify a few points.

1. 'coastal-trapped' should be 'coastally-trapped' throughout the paper. 2. P. 63, description of Figure 2. The description of Figure 2, used to examine the spatial structure of the variability in the different frequency bands is a bit confusing, as it keeps jumping

from band to band, and includes comments about what happens at different depths. I would first make the important points about what happens at 1000 m depth, based on Figure 2,then mention what is found at other depths. For example we see that the meridional scale of the anomalies along the equator decreases with decreasing frequency, and also the meridional distribution of amplitude varies. Explain whether this is consistent with equatorial wave dynamics. Then describe the signal along the coast, and explain why the amplitude is larger at different frequency bands (depending upon the possibility of reflection at the eastern boundary). At this point, you can mention how things change with depth for the different frequency bands. 3. P. 64. Do you have any idea of why periods longer than 30 days are the most energetic at 4000 m depth? 4. P. 66, line 11. 'the coastline forms a cape', not form 5. Figure 4. What are the units? Around 2.5°S the phase speed seems lower in the Guinea model than in the linear model, while south of 5°S the signal in the linear model is slower, but it is hard to say with the scale of the plot. Maybe it would be useful to plot a line corresponding to a specific phase speed in both diagrams. Also, phase speed and amplitude seem to vary as a function of both latitude and time, and in different ways in the two models. Do you have any idea why? 6. Section 3. It is not clear to me what your conclusions are concerning vertical propagation. 7. P. 69, title of section 4 and throughout the rest of the paper. dissimetry should be dissymmetry 8. P. 70, line 6. The 10-20 day signal should be the 10-20 day signal 9. P. 70. In describing EXP3, it would be useful to emphasize that the lateral boundary conditions include signals propagating along the equator, as produced by remote forcing. 10. P. 71, line 10. significant is misspelled. 11. P. 72, line 12. Did you check the asymmetry of the boundary signal for period longer than 3 weeks in the models to see if the results are consistent with Kaufman et al. (1999)?

Interactive comment on Ocean Sci. Discuss., 6, 57, 2009.