

***Interactive comment on* “Mechanisms controlling primary and new production in a global ecosystem model – Part II: the role of the upper ocean short-term periodic and episodic mixing events” by E. E. Popova et al.**

**Anonymous Referee #3**

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Comments on "Mechanisms controlling primary and new production in a global ecosystem model

Part I The role of the large-scale upper mixed layer variability

Part II: the role of the upper ocean short-term periodic and episodic mixing events"

by E.E.Popova et al.

Both papers clearly deserve publication. But I found the reading cumbersome, partly because of too many details or speculations, partly also due to obviously sloppy

formulations or simple typo's.

I fully agree to the statements emphasizing the importance of physics and the intention to keep the biology simple. I am not sure that the choice of variables is optimal for a 6-component system. The title of part I, however, is misleading: it is just stated as a fact (1073,II.4,5) that UML is a key factor...

Part II presents highly interesting experiments on the influence of time resolution of the forcing. It is perhaps a matter of personal temper to call the results "dramatically different" or "remarkably similar".

Check the use of word "significant".

Some of the figs. can be viewed on screen; in the printversion they are awfully small.

Specific remarks:

p.1071 I.16 give details about "weak" restoring

1972 I.17: again time constant?

1072 I.25:"no significant trend": can you discriminate between trend and interannual variability? What about BATS in fig.2?

1077,1078: how much is speculation and how much is substantiated?

1084 I.17:OB1 is a numerical experiment, too. The reference in fig. caption 2-6 should be more direct.

I.25-27 and next line: are the data wrong?

Appendix A: It would be sufficient to discuss the parametrizations really used.

1096: I appreciate the compactness of the model description but I have doubts about correctness: Inserting B7 into B2 involves a term  $Q_N * Q_A$  and a square of J (B9).

I understand that neglectation of nitrification in the photic zone is fine for discrimination between new and regenerated production.

B15 and B20 both are  $B_P = \dots$  should B20 read  $B_N = ?$

what is the fate of  $(1 - \mu_d D \lambda_D)$  from B18?

$\lambda_D$  is not listed in the (awfully tiny font) Table 1.

figs. 2-6: "thick" means "black"?

1117 l.19: "not important" fits to my prejudices.

l.22: 1-D models are necessarily more sensitive to details of MLD.

1124 ll.1,8 : definitely typing errors?

1125 1st par. too much jumping between locations

1127 l. 16: is the limitation ameliorated or rather "light conditions"?

l.23 "in the centres"?

1139(d): what is "thin" or "thick"

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Interactive comment on Ocean Sci. Discuss., 3, 1115, 2006.

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Interactive Discussion

Discussion Paper