

***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.

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Interactive Discussion

Discussion Paper

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 neglect of nitrification in the photic zone is fine for discrimination between new... 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 I.19: "not important" fits to my prejudices. I.22: 1-D models are necessarily more sensitive to details of MLD. 1124 II.1,8 : definitely typing errors? 1125 1st par. too much jumping between locations 1127 I. 16: is the limitation ameliorated or rather "light conditions"? I.23 "in the centres"? 1139(d): what is "thin" or "thick"

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