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Interactive comment on "The role of mixotrophic protists in the biological carbon pump" *by* A. Mitra et al.

Anonymous Referee #1

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Conceptually this is a very important paper; only diatoms /new production conditions are adequately represented in carbon pump models, but all other food web conditions (?regenerated production) are dominated by mixotrophs, the dynamics of which are not adequately captured in current biogeochemical modelling efforts. Climate change and eutrophication are claimed to favor mixotrophs, thus emphasizing the need to develop this alternative paradigm.

My only comments relate to improving the overall presentation. The language can be much simplified. Classical vs alternative paradigm; immature vs mature systems (is this terminology appropriate?); r vs K selection (may be this is not needed at this stage); "non-phagotrophic stages of coccolithophorids (p.4, line 21); the perfect beast (p.9. line 27; explain). Constitutive chloroplasts etc. What does "in silica" mean. Use

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simple language. This paper deserves to be widely read and should be crystal clear.

Fig.2. When comparing the complex diagrams A and B, all that is different is the red arrow of MNF eating bacteria, and the dashed blue arrow from MNF back to DIP, DIN pools. The impact of including mixotrophy in models clearly is much more; the sizes of pools are different (illustrated in Fig.3) and so are the sizes of the flows. This is only adequately illustrated in Fig.6 (which is much clearer). Combine Figs 2 and 6 somehow.

Figs.4, 5 . For clarity, match the colour coding used in Fig 3 and 6

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