

Review of the revised version of  
**Steady-state solutions for subsurface chlorophyll  
maximum in stratified water columns with a  
bell-shape vertical profile of chlorophyll**

by X. Gong et al.

The authors have responded adequately to the majority of my comments. Hence, the revised version is very much improved. A few (mostly minor) points, however, still require attention:

- line 18/19: "The shape of SCM layer (thickness and intensity) are ..." Thickness and intensity do not affect the shape (which is Gaussian in this study). It suffices to write "Thickness and intensity of the SCM are ..."
- line 23/24: "were also presented" should be "are also presented".
- line 30: "while it existed" should be "while it exists".
- line 38: the phrase "with vertically heterogeneous turbulent mixing" may be misleading. Turbulent mixing does not have to be heterogeneous, it is sufficient if there is a vertical profile that can be approximated by two layers of constant diffusivity (as this and other studies have shown).
- line 52: "SCM has attracted" should be "SCMs have attracted".
- line 70: "... depends strongly on sinking velocity of phytoplankton" the words "and/or detritus" should added, as Beckmann and Hense (2007) do not assume sinking phytoplankton.
- line 85: "of an infinite thickness" should be "of an infinitely small thickness".
- line 109 (Equation 2): The conversion factor 1.59 g Chl a per mol N needs to appear in the first two terms on the right hand side of equation 2 (and possibly other equations as well).
- line 155: "controls the width of the SCML" should be ""controls the thickness of the SCML"

- line 210: "Especially, ..." should be "In particular, ..."
- line 364/366: "sceneries" maybe better "scenarios".
- line 462: "Although these are important aspects that could be included ..." I don't see how these aspects could easily be included in this approach without making the system analytically intractable. Maybe just write "Although these are important aspects, their addition is unlikely to change our conclusions qualitatively."
- line 491: "... is the growth rate under the limitation of light intensity [...] is larger than ..." should be "... is **that** the growth rate under the limitation of light intensity [...] is larger than ..."
- line 527: Since BATS is spelled out, the same should be done for SEATS and HOTS.
- line 588: "Note that we have known ..." is unclear. Do you mean "It is well known that ..."?
- line 530ff: and Figure 2: It seems that there is a systematic underestimation of the three quantities by the model. Is that something that can be explained?
- line 776: The description of colors in the figure caption is mixed up. In my copy, the red solid line refers to  $f(I)$  (not the Chl a concentration, which is green), and there is no black dashed line. Otherwise the figure is much improved.
- line 804: is the  $dN/dz$  value for HOTS from Beckmann and Hense (2007) or from Hense and Beckmann (2008). Please check again.