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Comment

## ***Interactive comment on “Neural network-based estimates of Southern Ocean net community production from in-situ O<sub>2</sub>/Ar and satellite observation: a methodological study” by C.-H. Chang et al.***

### **Anonymous Referee #2**

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General comments: The authors of this manuscript tries to explain the climatological NCP distributions during the November-March period in the Southern Ocean using a SOM technique. Based on their careful examination, they found Chl-a, PAR and MLD were the suitable predictors for NCP. As a result, it appears that they successfully construct the NCP distributions. I think the present manuscript is well documented for their analysis, but more information should be clarified for their methodology. In their supplement document, they mentioned that the approach of determining predictor/predictand SOM clusters is quite similar to that of Telszewski et al. [2009] except for one main dif-

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ference, and they combine the training and the labeling steps of map generation from Telszewski et al. [2009] into a single step. It means to me that their SOM is trained by only the data in the regions where in-situ observations have been made. However, Telszewski et al. [2009] indicates that the SOM should be trained by the whole grid data so that the SOM has been preconditioned with comprehensive, basin-wide training knowledge with regards to the relevant biogeochemical processes. In this aspect, the technique in this study is completely different from that of Telszewski et al. [2009]. I think the authors should clarify how they overcome the claim of Telszewski et al. [2009]. Furthermore, it would be grateful if more information about the SOM technique (e.g. how many neurons were used and how many times the rough and fine tunings were executed in the first step. etc) is described so that any researchers can follow their experiment.

Minor comments: P. 16944, L. 19: It should be noted how much “not well-calibrated” Chl-a concentrations obtained from the satellite differs from in-situ data. I think that SOM doesn't need accurate values in practice, but its temporal and spatial variation is more important for the analysis.

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**BGD**

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