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Interactive comment on "Diapycnal dissolved organic matter supply into the upper Peruvian oxycline" *by* Alexandra N. Loginova et al.

Anonymous Referee #1

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General Comments:

The basic question posed in the Abstract was "how important is DOM utilization for O2 respiration within the Peruvian OMZ". The answer was not given unambiguously in the Abstract. The answer the authors should give in the Abstract, based on their results, is that "DOM introduced by vertical mixing has no role in contributing to O2 consumption in the core of the OMZ". This answer is given in the Discussion, but it is not in the Abstract. Instead, the authors state that "DOM utilization may play a significant role for shape of the upper Peruvian oxycline"; but that statement is not the answer to the question posed. The Abstract needs to be written for absolute clarity in terms of question and answer.

I did not find the outcomes of this work to be enlightening. We could see in the data

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Discussion paper

plots that DOC was high at the surface but low at 40, so clearly it was not surviving export by mixing to even 40 m depth. So its small (or non-existent) contribution to export into the OMZ core is pretty obvious just by looking at the distributions; the great effort by the authors to calculate vertical fluxes may have been excessive given the obvious answer to the question.

I'm not sure what is the main point of this paper. DOM is essentially not exported to the OMZ, but we did not need to see all the work done by the authors to know that outcome. That it contributes to the "shape of the upper oxycline" is the final finding given in the Abstract, but does that matter? The shape of the oxycline is not discussed elsewhere in the paper.

Specific Comments (Pg#/Line#)

1/31 "is one of the largest regions" In what regard? For an OMZ? And, "where the role of O2 concentrations discriminates." Discriminates what? And does an O2 concentration really have "a role"?

2/7 "anoxia-related processes" not enough information in that phrase.

2/26: "Accessing" should be "Assessing"

3/18 The acronym "GO" should be spelled out; presumably it is "General Oceanics"

6/2 What exactly is the "diapycnal solute supply"? This term should be explained fully, as it is central to the findings in the manuscript. Telling the reader that it is a 'divergence in flux' is inadequate.

6/25-26 Surface DOC concentrations >100 umol/L are not found in the ocean unless a river is nearby, which can add terrigenous DOC. The high values seem unrealistic. The values in the surface layer that are closer to 70 uM are more realistic, based on the data reported by Letscher et al. 2015 at nearby locations. The elevated DOC values at greater depth are suspect as well.

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